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Kansas State University Bulletin 1990-92

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Information

You may call **toll-free** for information about admission to Kansas State University.

Undergraduate students

Dial 1-800-432-8270 from any place in Kansas 24 hours a day. After 5 p.m. your call will be recorded and returned the next working day. Outside of Kansas dial 913-532-6250.

Prospective students should communicate with the director of Admissions, 119 Anderson Hall.

Graduate students

Dial 1-800-232-0133, ext. 6194, 24 hours a day. After 5 p.m. your call will be recorded and returned the next day. Outside the United States dial 913-532-6191.

Prospective students should communicate with the dean of the Graduate School, 101 Fairchild Hall.

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The material in this catalog is provided for informational purposes and does not constitute a contract. For example, courses, curricula, degree requirements, fees, and policies are subject to constant review and change without notice.

Notice of Nondiscrimination

Kansas State University is committed to a policy of nondiscrimination on the basis of race, sex, national origin, handicap, or other nonmerit reasons, in admissions, educational programs or activities, and employment, all as required by applicable laws and regulations. Responsibility for coordination of compliance efforts and receipt of inquiries, including those concerning Title IX of the Education Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973, has been delegated to Jane D. Rowlett, Ph.D., Director, Affirmative Action Office, 214 Anderson Hall, Kansas State University, Manhattan, Kansas 66506, (913) 532-6220.

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The Catalog

The *KSU General Catalog* is a reference for those interested in academic policies, procedures, and programs of the University. Check the table of contents or the index for specific topics of interest.

Degree requirements and programs are organized by colleges and departments. Course descriptions are provided to help you and your academic advisor plan your academic choices.

The following course description key explains the system used for courses listed throughout the catalog.

Sample course description

ENGL 525. Women in Literature. (3) I, II, S. Literary works, chiefly fiction, by or about women. Considers important writers since 1800 and significant themes in literature about women. Pr.: ENGL 120 or 125. ENGL-525-0-1502

The letters **ENGL** denote the department in which the course is offered (in this case, English).

The three digits of the course number **525** represent the level of the course.

Level numbers:

- 000-099 Not applicable toward degree requirements.
- 100-299 Lower division undergraduate. Designed as freshman or sophomore course.
- 300-499 Upper division undergraduate. Designed as junior or senior course.
- 500-699 Upper division undergraduate. Primarily for a junior or senior, but also may be taken for graduate credit. A course numbered 500 may be taken for graduate credit only in a minor field. A course numbered 600 may be taken for credit in a graduate student's major.
- 700-799 Graduate and upper division, primarily for graduate level.
- 800-899 Graduate level for master's course or professional course beyond the undergraduate level.
- 900-999 Graduate level, primarily for doctoral candidate.

The number in parentheses (3) following the course title indicates the units of credit given for the course. Each credit unit usually represents one 50-minute period of lecture or recitation each week of the semester.

The **I, II, S**, and/or **intersession** following the course title indicate the semester, or semesters, each course is usually offered; **I** stands for fall semester, **II** for spring, **S** for summer school, and **intersession** for the term between semesters.

The abbreviation **Pr.** indicates prerequisites for the course. In the sample course, students would be required to have completed either ENGL 120 or ENGL 125 before enrolling for ENGL 525. Some courses may allow or require concurrent enrollment in other courses. This is indicated by the abbreviation **Conc.**

Faculty lists key

Each academic department at Kansas State University is described in this catalog. In the departmental sections, faculty members are listed by their last names. Faculty members who are on the graduate faculty have an asterisk following their names.

An all-inclusive University faculty and administration section precedes the index. This section lists each faculty member's academic degrees. The year of the faculty member's first appointment to KSU is given in parentheses.

Other publications

Other K-State publications are available on request from the offices listed below. See also the scholarly and professional publications listing under Research, Extension, and Outreach.

Office of Admissions

119 Anderson Hall, 532-6250

K-State Admissions Guide: an introduction to Kansas State University, including photographs and undergraduate application information and forms.

Division of Continuing Education

College Court Building, 532-5687

Summer School Bulletin: course descriptions and admission information. Available in early spring.

After Hours: information and course descriptions for classes starting after 4 p.m. on campus during fall and spring semesters. Available in December and July.

Graduate School

101 Fairchild Hall, 532-6191

The Graduate School: an introduction to KSU's graduate programs that includes photos and admission information.

K-State Union Bookstore

K-State Union, First Floor, 532-6583

Class Schedule: a complete description of the courses offered during each academic term.

The University

Kansas State University

The University was founded February 16, 1863, established under the Morrill Act, by which land-grant colleges came into being.

At first the University was located on the grounds of the old Bluemont Central College, chartered in 1858, but in 1875 most of the work of the University was moved to the present site.

The 664-acre campus is in northern Manhattan, convenient to both business and residential districts. Most campus buildings are constructed of native limestone.

Manhattan is situated in the rolling Flint Hills of northeast Kansas, 125 miles west of Kansas City via Interstate Highway 70. Five miles north of the city is Tuttle Creek Reservoir, one of the largest in the Midwest.

Off-campus experimental work in agriculture and other fields of study is accomplished through the Kansas Agricultural Experiment Station and its four branch stations—at Hays, Garden City, Colby, and Parsons. University-owned and -leased land at the station sites and 11 experimental fields exceeds 18,000 acres.

Educational work in agriculture, home economics, 4-H, and community development is conducted throughout Kansas in cooperation with 105 County Extension Councils legally established for this purpose.

Objective of the educational program

The objective of the educational program at Kansas State University is to develop individuals capable of applying enlightened judgment in their professional, personal, and social lives.

To that end the University program is designed:

I. To provide full and efficient counseling and guidance to students at the University. Specifically, this means to:

A. Learn and make known to students all that is possible and useful about their interests, aptitudes, and abilities.

B. Apply that knowledge to the students' choice of courses and curricula as fully as possible without encroaching harmfully on their initiative and feeling of self-responsibility.

C. Provide continuing guidance for students according to their needs.

II. To prepare students for an occupation or a profession which includes an organized body of information and theory so they may realize their creative potential. More specifically this means that students should acquire:

A. The ability to recognize and master fundamental principles in their fields of specialization.

B. The knowledge basic to their special fields of study.

C. The ability to reason critically from facts and recognized assumptions to useful technical conclusions.

D. The basic skills associated with their fields of study.

E. A professional attitude in their chosen work.

III. To provide all students with an opportunity to gain the knowledge and abilities members of a democratic society need, whatever occupation or profession they expect to enter. Specifically, this means that through its program the University undertakes to help the student:

A. Develop communication skills.

B. Develop the ability to apply critical and creative thinking to the solution of theoretical and practical problems.

C. Understand the basic concepts of the natural sciences, the interrelations of the natural and social sciences, and the impact of science on society.

D. Comprehend and evaluate the processes and institutions in society at home and abroad, and develop a dynamic sense of personal responsibility as effective citizens in a democratic society.

E. Develop habits of self-evaluation, responsibility, and enterprise that will increase the effectiveness of the educative process in college, and provide the basis for continued self-improvement.

F. Develop a well-adjusted personality, good character traits, and a sound philosophy of life.

G. Prepare for effective participation in family life.

H. Utilize actively and fully the capacity for aesthetic appreciation and enjoyment.

IV. To stimulate the faculty and students to extend the boundaries of knowledge through critical and creative thinking and experimentation.

V. To provide the facilities for extending education outside the boundaries of the campus to the members of the community that the institution serves.

Accreditation

Kansas State University is fully accredited by the North Central Accrediting Association and by various professional accrediting agencies. Credit earned at KSU is transferable to other institutions.

Faculty

The faculty at Kansas State University is dedicated to excellence in teaching, student advising, research, extension education, scholarly achievement, and creative endeavor.

KSU recognizes superior teaching with annual faculty awards. Citations for the Outstanding Teachers of the Year and for the Distinguished Graduate Faculty Member are presented at Commencement. KSU also honors faculty members who contribute to the expansion of knowledge in their respective fields.

The faculty at KSU also is committed to public and professional service. Many are elected or appointed each year to positions of leadership in state, national, and international professional and service organizations.

Calendar

Summer Term 1990

June 4, Monday

Summer term enrollment. Last day to withdraw from an eight-week course with 100% fee refund.

June 5, Tuesday

Classes, late enrollment fee of \$15, and drop/add begin.

June 6, Wednesday

Program of study due in Graduate School Office.

June 8, Friday

Last day to withdraw from an eight-week course with 90% fee refund, to enroll without dean's permission, or for faculty, staff, and teachers to enroll without late enrollment fee.

June 13, Wednesday

Typed copies of doctoral dissertations, with approval form, in major professor's office; approval form obtained in Graduate School Office.

June 15, Friday

Last day to withdraw with 50% fee refund, to sign-up for A/Pass/F grading option for an eight-week course, and to submit an undergraduate application for July graduation to dean's office.

June 19, Tuesday

Late enrollment fee of \$35 begins.

June 20, Wednesday

Last day to drop an eight-week course without a W being recorded. Dissertation approval form (with abstract) due in Graduate School Office. Typed copies of master's thesis or report, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

June 28, Thursday

Applications for undergraduate graduation due in University Registrar's Office from deans' offices.

July 2, Monday

Last day for doctoral final examination. Master's approval form (with abstract) due in Graduate School Office, including non-thesis and non-report.

July 4, Wednesday

Independence Day. University holiday.

July 6, Friday

Last day an eight-week course may be dropped before the end of summer term.

July 9, Monday

Ballot and final copies of doctoral dissertation due in Graduate School Office.

July 12, Thursday

Last day for master's final examination.

July 17, Tuesday

Ballot and final copies of master's thesis or report due in Graduate School Office.

July 27, Friday

Last day of summer term examinations.

July 30, Monday

Final grade sheets due in Enrollment Center.

Fall Semester 1990

August 22-24, Wednesday-Friday

Enrollment and fee payment.

August 24, Friday

Last day to withdraw with 100% fee refund.

August 26, Sunday, 1-3 p.m.

Express Sunday enrollment.

August 26, Sunday, 3:30 p.m.

Late enrollment fee of \$15 begins.

August 26-31, Sunday

(3:30-5:30 p.m.)-Friday

Late enrollment and fee payment.

August 27, Monday

Classes and drop/add begin.

August 27-30, Monday-Thursday

Evening enrollment and fee payment.

August 31, Friday

Last day to add a course without instructor permission, and for faculty, staff, and teachers to enroll without late enrollment fee.

September 3, Monday

Labor Day. University holiday.

September 7, Friday

Last day to withdraw with 90% fee refund, to sign up for A/Pass/F grading option for a course that meets the first half of the semester, and to enroll without dean's permission.

September 13, Thursday

Last day to drop a course that meets the first half of the semester without a W being recorded.

September 14, Friday

Program of study due in Graduate School Office.

September 21, Friday

Last day to withdraw with 50% fee refund, to sign up for A/Pass/F grading option for a full semester course, and to submit December graduation application to dean's office. Checksheet for graduate students completing degree requirements

for December graduation due in Graduate School Office.

September 24, Monday

Twentieth class day.

September 25, Tuesday

Late enrollment fee of \$35 begins.

September 28, Friday

Academic progress reports due at noon in Enrollment Center. Last day to drop a course that meets the first half of the semester.

October 1, Monday

Last day to drop a full semester course without W being recorded.

October 5, Friday

Typed copies of doctoral dissertations, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

October 12, Friday

Typed copies of master's thesis or report, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

October 22, Monday

Courses that meet second half of the semester begin. Dissertation approval form (with abstract) due in Graduate School Office.

October 29, Monday

Master's approval form (with abstract) due in Graduate School Office, including non-thesis and non-report.

November 1, Thursday

Deadline for international graduate student applications for spring 1991.

November 2, Friday

Last day to drop a full semester course or to sign up for A/Pass/F grading option for a course that meets the second half of the semester. Last date for doctoral final examinations.

November 7, Wednesday

Last day to drop a course that meets the second half of the semester without a W being recorded.

November 9, Friday

Last day for master's final examination.

November 12-20 and 26-30, Monday-Friday

Early enrollment for spring 1991.

November 13, Tuesday

Ballot and final copies of doctoral dissertation due in Graduate School Office.

November 20, Tuesday

Ballot and final copies of master's thesis or report due in Graduate School Office.

November 21–25, Wednesday–Sunday
Student Thanksgiving holiday.

November 22–23, Thursday–Friday
University holiday.

November 26, Monday
Classes resume. Last day to drop a course that meets the second half of the semester.

December 3–5, Monday–Wednesday
Winter 1991 intersession enrollment.

December 15, Saturday
Commencement.

December 17–21, Monday–Friday
Semester examinations.

December 24–25, Monday–Tuesday
University holiday.

January 2, Wednesday, Noon
Deadline for grades to be submitted to Enrollment Center.

Winter 1991 Intersession

Dec. 3–5, Monday–Wednesday
Winter 1991 intersession enrollment.

January 1, Tuesday
New Year's Day. University holiday.

January 2–15, Monday–Friday
Winter 1991 intersession.

Spring Semester 1991

January 1, Tuesday
New Year's Day. University holiday.

January 13, Sunday, 1–3 p.m.
Express Sunday enrollment.

January 14–15, Monday–Tuesday
Enrollment and fee payment.

January 15, Tuesday
Last day to withdraw with 100% fee refund.

January 16, Wednesday
Classes, late enrollment fee of \$15, and drop/add begin.

January 16–18, 22, and 28, Wednesday–Friday, Tuesday, Monday
Late enrollment and fee payment.

January 16–17, 22, and 28, Wednesday–Thursday, Tuesday, Monday
Evening enrollment and fee payment.

January 21, Monday
Martin Luther King Day. University holiday.

January 23, Wednesday
Last day to add a course without instructor's permission, and for faculty, staff, and teachers to enroll without late enrollment fee.

January 25, Friday
Last day to withdraw with 90% fee refund, to sign up for A/Pass/F grading option for a course that meets the first half of the semester, and to enroll without dean's permission.

February 1, Friday
Program of study due in Graduate School Office.

February 4, Monday
Last day to drop a course that meets the first half of the semester without a W being recorded.

February 8, Friday
Last day to withdraw with 50% fee refund, to sign up for A/Pass/F grading option for a full semester course, and to submit May undergraduate application to dean's office. Checksheet for graduate students completing degree requirements for May graduation due in Graduate School Office.

February 13, Wednesday
Twentieth class day.

February 14, Thursday
Last enrollment fee of \$35 begins.

February 15, Friday, Noon
Academic progress reports due in Enrollment Center. Last day to drop a course that meets the first half of the semester.

February 20, Wednesday
Last day to drop a full semester course without a W being recorded.

March 1, Friday
Typed copies of doctoral dissertation, with approval form, due in major professor's office; approval form obtained in Graduate School Office. Deadline for international graduate student applications for summer 1991.

March 8, Friday
Typed copies of master's thesis or report, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

March 9–17, Saturday–Sunday
Student spring break.

March 18, Monday
Classes resume. Classes that meet the second half of the semester begin.

March 21, Thursday
Dissertation approval form (with abstract) due in Graduate School Office.

March 28, Thursday
Masters' approval form (with abstract) due in Graduate School Office, including non-thesis and non-report.

March 29, Friday
Last day to drop a full semester course and to sign up for A/Pass/F grading option for a course that meets only the second half of the semester.

April 3, Wednesday
Last day to drop a course that meets the second half of the semester without a W being recorded.

April 5, Friday
Last day for doctoral final examination.

April 11, Thursday
Last day for master's final examination.

April 12, Friday
Ballot and final copies of doctoral dissertation due in Graduate School Office.

April 15–26, Monday–Friday
Early enrollment for summer and fall 1991 courses.

April 19, Friday
Last day to drop a course that meets the second half of the semester. Ballot and final copies of master's thesis or report due in Graduate School Office.

April 29–May 1, Monday–Wednesday
Spring 1991 intersession enrollment.

May 9, Thursday
No classes. Final examinations for courses that meet only on Thursday night begin at 7 p.m. Deadline for submitting tentative grade sheets for graduating seniors to the Enrollment Center.

May 9–11, 13–15, Thursday (7 p.m.)–Saturday, Monday–Wednesday
Semester examinations.

May 16, Thursday
Deadline for returning grade change sheets for graduating seniors to the Enrollment Center.

May 17–18, Friday–Saturday
Commencement.

May 20, Monday
Deadline for submitting grades to the Enrollment Center.

Spring 1991 Intersession

April 29–May 1, Monday–Wednesday
Spring 1991 intersession enrollment.

May 20–31, Monday–Friday
Spring 1991 intersession.

Summer Term 1991

June 1, Monday
Deadline for international graduate student applications for fall 1991.

June 3, Monday
Summer term enrollment. Last day to withdraw from an eight-week course with 100% fee refund.

Fall Semester 1991

June 4, Tuesday

Classes, late enrollment fee of \$15, and drop/add begin.

June 5, Wednesday

Program of study due in Graduate School Office.

June 7, Friday

Last day to withdraw from an eight-week course with 90% fee refund; to enroll without dean's permission; and for faculty, staff, and teachers to enroll in an eight-week course without late enrollment fee.

June 12, Wednesday

Typed copies of doctoral dissertations, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

June 14, Friday

Last day to withdraw with 50% fee refund, to sign up for A/Pass/F grading option for an eight-week course, and to submit an undergraduate application for July graduation to dean's office.

June 18, Tuesday

Late enrollment fee of \$35 begins.

June 19, Wednesday

Dissertation approval form (with abstract) due in Graduate School Office. Typed copies of master's thesis or report, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

June 20, Thursday

Last day to drop an eight-week course without a W being recorded.

June 27, Thursday

Applications for undergraduate graduation due in University Registrar's Office from dean's offices.

June 28, Friday

Last day for doctoral examination. Master's approval form (with abstract) due in Graduate School Office, including non-thesis and non-report.

July 4, Thursday

Independence Day. University holiday.

July 5, Friday

Last day an eight-week course can be dropped.

July 8, Monday

Ballot and final copies of doctoral dissertation due in Graduate School Office.

July 11, Thursday

Last date for master's final examination.

July 18, Thursday

Ballot and final copies of master's thesis or report due in Graduate School Office.

July 26, Friday

Last day of summer term examinations.

July 29, Monday, Noon

Final grade sheets due in the Enrollment Center.

August 21-23, Wednesday-Friday

Enrollment and fee payment.

August 23, Friday

Last day to withdraw with 100% fee refund.

August 25, Sunday, 1-3 p.m.

Express Sunday enrollment.

August 25, Sunday, 3:30 p.m.

Late enrollment fee of \$15 begins.

August 25-30, Sunday (3:30-5:30 p.m.)-Friday

Late enrollment and fee payment.

August 26, Monday

Classes, late enrollment fee of \$15, and drop/add begin.

August 26-29, Monday-Thursday

Evening enrollment and fee payment.

August 30, Friday

Last day to add a course without instructor permission, and for faculty, staff, and teachers to enroll without late enrollment fee.

September 2, Monday

Labor Day. University holiday.

September 6, Friday

Last day to withdraw with 90% fee refund, to sign up for A/Pass/F grading option for a course that meets the first half of the semester, and to enroll without dean's permission.

September 12, Thursday

Last day to drop a course that meets the first half of the semester without a W being recorded.

September 13, Friday

Program of study due in Graduate School Office.

September 20, Friday

Last day to withdraw with 50% fee refund, to sign up for A/Pass/F grading option for a full semester course, and to submit December graduation application to dean's office. Checksheet for graduate students completing degree requirements for December graduation due in Graduate School Office.

September 23, Monday

Twentieth class day.

September 24, Tuesday

Late enrollment fee of \$35 begins.

September 27, Friday

Academic progress reports due at noon in Enrollment Center. Last day to drop a course that meets the first half of the semester.

September 30, Monday

Last day to drop a full semester course without W being recorded.

October 4, Friday

Typed copies of doctoral dissertations, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

October 11, Friday

Typed copies of master's thesis or report, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

October 21, Monday

Courses that meet the second half of the semester begin. Dissertation approval form (with abstract) due in Graduate School Office.

October 28, Monday

Master's approval form (with abstract) due in Graduate School Office, including non-thesis and non-report.

November 1, Friday

Last day to drop a full semester course or to sign up for A/Pass/F grading option for a course that meets only the second half of the semester. Last date for doctoral final examination. Deadline for international graduate student applications for spring 1992.

November 6, Wednesday

Last day to drop a course that meets the second half of the semester without a W being recorded.

November 8, Friday

Last day for master's final examination.

November 18-26, December 2-6, Monday-Friday

Early enrollment for spring 1992 courses.

November 12, Tuesday

Ballot and final copies of doctoral dissertation due in Graduate School Office.

November 19, Tuesday

Ballot and final copies of master's thesis or report due in Graduate School Office.

November 27-December 1, Wednesday-Sunday

Student Thanksgiving holiday.

November 28-29, Thursday-Friday

University holiday.

December 2, Monday

Classes resume. Last day to drop a course that meets the second half of the semester.

December 9-11, Monday-Wednesday

Winter 1992 intersession enrollment.

December 14, Saturday

Commencement.

December 16-20, Monday-Friday

Semester examinations.

December 23, Monday

Deadline for grades to be submitted to the Enrollment Center.

December 25, Wednesday

University holiday.

Winter 1992 Intersession

December 9-11, Monday-Wednesday
Winter 1992 intersession enrollment.

January 1, Wednesday
New Year's Day. University holiday.

January 2-15, Monday-Friday
Winter 1992 intersession.

Spring Semester 1992

January 1, Wednesday
New Year's Day. University holiday.

January 12, Sunday, 1-3 p.m.
Express Sunday enrollment.

January 13-14, Monday-Tuesday
Enrollment and fee payment.

January 14, Tuesday
Last day to withdraw with 100% fee refund.

January 15, Wednesday
Classes, late enrollment fee of \$15, and drop/add begin.

January 15-17, 21, 27, Wednesday-Friday, Tuesday, Monday
Late enrollment and fee payment.

January 15-16, 21, 27, Wednesday-Thursdays, Tuesday, Monday
Evening enrollment and fee payment.

January 20, Monday
Martin Luther King Day. University holiday.

January 22, Wednesday
Last day to add a course without instructor's permission, and for faculty, staff, and teachers to enroll without late enrollment fee.

January 24, Friday
Last day to withdraw with 90% fee refund, to sign up for A/Pass/F grading option for a course that meets the first half of the semester, and to enroll without dean's permission.

January 31, Friday
Last day to submit May graduation application in dean's office.

February 3, Monday
Last day to drop a course that meets the first half of the semester without a W being recorded. Program of study due in Graduate School Office.

February 7, Friday
Last day to withdraw with 50% fee refund, and to sign up for A/Pass/F grading option for a full semester course.

February 10, Monday
Checksheet for graduate students completing degree requirements for May graduation due in Graduate School Office.

February 12, Wednesday
Twentieth class day.

February 13, Thursday
Last enrollment fee of \$35 begins.

February 14, Friday
Academic progress reports due at noon in Enrollment Center. Last day to drop a course that meets the first half of the semester.

February 19, Wednesday
Last day to drop a full semester course without a W being recorded.

February 28, Friday
Typed copies of doctoral dissertations, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

March 1, Sunday
Deadline for international graduate student applications for summer 1992.

March 6, Friday
Typed copies of master's thesis or report, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

March 7-15, Saturday-Sunday
Student spring break.

March 16, Monday
Classes resume. Class that meets the second half of the semester begins.

March 23, Monday
Dissertation approval form (with abstract) due in Graduate School Office.

March 27, Friday
Last day to drop a full semester course before end of the semester, and to sign up for A/Pass/F grading option for a course that meets only the second half of the semester.

March 30, Monday
Master's approval form (with abstract) due in Graduate School Office, including non-thesis and non-report.

April 1, Wednesday
Last day to drop a course that meets the second half of the semester without a W being recorded.

April 3, Friday
Last day for doctoral final examination.

April 10, Friday
Last day for master's examination.

April 13, Monday
Ballot and final copies of doctoral dissertation due in Graduate School Office.

April 13-24, Monday-Friday
Early enrollment for summer and fall 1992 courses.

April 17, Friday
Last day to drop a course that meets the second half of the semester.

April 20, Monday
Ballot and final copies of master's thesis or report due in Graduate School Office.

April 27-29, Monday-Wednesday
Spring 1992 intersession enrollment.

May 7, Thursday
No classes. Final examinations for courses that meet only on Thursday night begin at 7 p.m. Deadline for submitting tentative grade sheets for graduating seniors to the Enrollment Center.

May 7-9, 11-13, Thursday (7 p.m.)-Saturday, Monday-Wednesday
Semester examinations.

May 14, Thursday
Deadline for returning grade change sheets for graduating seniors to the Enrollment Center.

May 15-16, Friday-Saturday
Commencement.

May 18, Monday
Deadline for submitting grades to the Enrollment Center.

Spring 1992 Intersession

April 27-29, Monday-Wednesday
Spring 1992 intersession enrollment.

May 18-29, Monday-Friday
Spring 1992 intersession.

Summer Term 1992

June 1, Monday
Deadline for international student applications for fall 1992.

June 8, Monday
Summer term enrollment. Last day to withdraw from an eight-week course with 100% fee refund.

June 9, Tuesday
Classes, late enrollment fee of \$15, and drop/add begin.

June 10, Wednesday
Program of study due in Graduate School Office.

June 12, Friday
Last day to withdraw from an eight-week course with 90% fee refund; to enroll without dean's permission; and for faculty, staff, and teachers to enroll without late enrollment fee.

June 17, Wednesday

Typed copies of doctoral dissertation, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

June 19, Friday

Last day to withdraw with 50% fee refund, to sign up for A/Pass/F grading option for an eight-week course, and to submit an undergraduate application for July graduation to dean's office.

June 23, Tuesday

Late enrollment fee of \$35 begins.

June 24, Wednesday

Dissertation approval form (with abstract) due in Graduate School Office. Typed copies of master's thesis or report, with approval form, due in major professor's office; approval form obtained in Graduate School Office.

June 25, Thursday

Last day to drop an eight-week course without a W being recorded.

July 2, Thursday

Applications for undergraduate graduation due in University Registrar's Office from dean's offices.

July 3, Friday

Independence Day observed. University holiday.

July 6, Monday

Last day for doctoral final examination. Master's approval form (with abstract) due in Graduate School Office, including non-thesis and non-report.

July 10, Friday

Last day to drop an eight-week course before the end of the term.

July 13, Monday

Ballot and final copies of doctoral dissertation due in Graduate School Office.

July 16, Thursday

Last day for master's final examination.

July 23, Thursday

Ballot and final copies of master's thesis or report due in Graduate School Office.

July 31, Friday

Last day for summer term examinations.

August 3, Monday, Noon

Final grade sheets due in the Enrollment Center.

Graduate students

Graduate School submission deadlines and examination dates were under review at the time of printing. Contact the Graduate School for possible changes.

Glossary and Abbreviations

A/Pass/F: An alternative grading option in which a student earning a grade of A in a course will have an A recorded for that course; a grade of B, C, or D will be recorded as a Pass; and a grade of F will be recorded as an F.

Academic load: The total number of semester hours for which a student is enrolled in one semester.

Advanced standing: Having credit awarded for previous work or testing.

Advisor: A faculty member who provides information for a student and makes recommendations on courses, requirements, prerequisites, and programs of study. Each student is assigned an advisor.

Audit: To attend a class regularly without participating in class work and without receiving credit.

B.A.: Bachelor of arts degree. Courses are selected from a variety of disciplines although concentrations are in one or two areas. A modern language is required for a B.A. degree.

B.S.: Bachelor of science degree. A specified program of required courses with fewer electives than the B.A. A modern language may be taken but is not required.

Baccalaureate: Refers to the bachelor's degree.

Classification: Level of progress toward a degree. An undergraduate student is classified as a freshman, sophomore, junior, or senior, depending on the number of semester hours completed.

College: An academic unit of the University. Kansas State University is composed of eight colleges and a Graduate School.

Concurrent enrollment: Taking a course during the same semester as another. Abbreviation: Conc.

Course: A unit of study a student enrolls in during a semester.

Credit by examination: Credit received from the University when a student takes an oral or written examination without registering for a course.

Credit hour: A unit of measurement used in determining the quantity of work taken by a student. Each credit hour is roughly equivalent to one hour of class time per week. For example, a class meeting three hours a week would be a three-credit-hour class. Abbreviation: Cr.

Credit/No Credit: An alternative grading option in which the successful completion of a course is recorded as Credit and failure is recorded as No Credit. No other grades are given for such courses and they are not figured into the grade point average.

Curriculum: A program of courses that meets the requirements for a degree in a particular field of study.

Degree program: Courses required for completion of a particular degree.

Department: A unit within a college representing a discipline, such as the Department of Statistics or the Department of Agronomy.

Discipline: An area of study representing a branch of knowledge, such as mathematics.

Dismissal: A student who neglects his or her academic responsibilities may be dismissed on recommendation of an academic dean.

Double major: Having two programs of academic study, each requiring considerable course work.

Drop/Add: Changing the student's class schedule by adding a course, dropping a course, or both.

Dual degree: A student may elect in some cases to earn two degrees at one time.

Ed.D.: Doctor of Education degree. A post-baccalaureate degree awarded upon completion of at least three years of full-time specialized study, together with a major research contribution to the discipline that demonstrates independence as a scholar. The degree culminates with a formal dissertation.

Electives: Courses chosen by a student that are not required for the major or minor. The number of hours of electives required for graduation varies according to student's major.

Enrollment: The process of selecting courses and arranging a schedule for a semester.

Equiv.: Equivalent.

Extracurricular: Activities such as band, debate, and athletics for which a student may earn credit toward graduation. Extracurricular activities are counted as electives.

Financial aid: Help for a student who lacks funds to pay for college. Aid is available from grants, loans, scholarships, and work/study employment.

Grade point average (GPA): A measure of scholastic performance. A GPA is obtained by dividing the number of grade points by the hours of work attempted. For the purpose of GPA, an A = 4 points, a B = 3 points, a C = 2 points, a D = 1 point, and an F = 0 points.

Graduate student: A student who has completed a bachelor's degree and has met all the requirements for admission to the Graduate School.

Hour: The unit by which course work is measured. The number of semester hours assigned to a course is usually determined by the number of hours a class meets per week.

Intersession: Immediately preceding the spring and summer semester, regular and new or experimental courses are offered between regular semesters and summer session. They usually run for two weeks, and can fulfill degree requirements. Intersession offers the opportunity to explore areas of study which would not be possible during regular semesters.

Lec.: Lecture. A class wherein the teaching is done primarily through oration from the instructor.

M.A.: Master of arts degree. A post-baccalaureate degree awarded upon completion of about 30 semester hours in the humanities or social sciences. May or may not include research and a thesis, depending on the field of study.

Major: The subject or subject areas upon which a student chooses to place principal academic emphasis.

M.S.: Master of science degree. A post-baccalaureate degree awarded upon completion of about 30 semester hours in the sciences or professions. Research and a thesis are required in most of the sciences.

Option: An approved group of courses creating a specialty within a major field of study.

Orientation: Activities and programs designed to help the new student become acquainted with the University.

Ph.D.: Doctor of philosophy degree. A post-baccalaureate degree awarded upon completion of at least three years of full-time specialized study, together with a major research contribution to the discipline that demonstrates independence as a scholar. The degree culminates with a formal dissertation.

Prerequisite: A requirement, usually credit in another course, which must be met before a particular course can be taken. Abbreviation: Pr.

Probation: Probation is an academic warning that a student is in academic difficulty which could lead to dismissal from the University. An undergraduate student may be placed on academic probation for an indefinite period of time by an academic dean if requirements are not met. See the Grades section of this catalog.

Rec.: Recitation. A small section usually taken in conjunction with a lecture. Primarily group discussion of the lecture.

Scholastic honors: An undergraduate student may be designated as summa cum laude, magna cum laude, or cum laude based on the excellence of his or her KSU academic average.

Secondary major: Interdisciplinary major which must be completed along with a first major course of study.

Special student: An undergraduate student taking courses at KSU but not regularly enrolled in work toward a degree.

Transcript: An official copy of a student's permanent academic record.

Transfer student: A student who terminates enrollment in another college or university and subsequently enrolls in KSU.

Undergraduate student: A University student who has not received a bachelor's degree.

V/Var.: Variable. The credits earned in some courses may vary.

Admission

Richard N. Elkins, Director
119 Anderson Hall
532-6250

Undergraduate students interested in attending Kansas State University should write to the Office of Admissions for an application form and instructions concerning the admission process. The student should return the completed application form with a nonrefundable \$15 application fee to the Office of Admissions. All correspondence and inquiries concerning admission to the university should be addressed to this office.

Admissions advising

The admissions office is open weekdays from 8 a.m. to 5 p.m. for admissions advising. Campus offices are closed Saturdays and Sundays.

Students and parents are always welcome and are encouraged to visit the campus for individual advising. However, it is best to write two weeks in advance for an appointment. Normally several advisors are available for consultation concerning educational plans.

The admissions office is in the center of the main administration building, Anderson Hall.

High school graduates

Admission to Kansas State University is granted to any individual who has graduated from an accredited Kansas high school. Out-of-state applicants are expected to have a strong academic rank in class and good scores on the American College Test battery. Applicants with previous college credit, earned after graduation from high school, must apply as transfer students.

No academically qualified applicant will be denied admission to the University on the basis of race, color, sex, religion, handicap, age, or national origin.

Specific admission procedures are given to students when they inquire about admission. Students should apply early in the senior year of high school.

High school prerequisites

Each entering freshman student should have completed the high school mathematics courses necessary for his or her KSU curriculum. A listing of the mathematics prerequisites for each University curriculum appears in the Undergraduate Degrees section of this catalog.

The Kansas Board of Regents recommends that a Kansas Regents university preparatory curriculum include the following 15 units:

Four units of English
Three units of mathematics
Three units of social studies
Three units of natural sciences
Two units of foreign languages

It is further recommended that each of these academic areas consist of the following:

English

Four units of composition and grammar, including one unit of literature and one unit of oral expression.

Mathematics

Two units of algebra and the remaining unit consisting of one-half unit of geometry and one-half unit of trigonometry with the objective of preparing students for entry-level calculus.

Social studies

One unit of American history, one-half unit of government, one-half unit of economics, and one additional social science course.

Natural sciences

Any combination of two of the three natural sciences (biology, chemistry, physics) which adds to three units or one unit each of biology, chemistry, and physics.

Foreign languages

Two units of one foreign language or one unit each of two foreign languages.

Transfer students

Transfer students (those with previous college credit) are expected to have at least a 2.0 (C) average in previous academic work to be considered for admission to the University. This applies both to Kansas and out-of-state transfer students.

Most academic credits from accredited junior and senior colleges and universities are transferable to KSU. Information about institutions previously attended and official transcripts must be furnished regardless of the applicant's wishes concerning advanced standing. Failure to provide either will disqualify the applicant. To be official, transcripts must be sent directly from each college attended to the KSU Office of Admissions. Hand-carried transcripts and transcripts sent by students are unofficial even though they may carry the college seal or signatures that are placed on official records. Only half of the hours required for a KSU degree can be taken at a two-year college.

K-State has a special pre-transfer advising agreement with selected Kansas community colleges which provides a structured program of advising and course selection to insure a smooth and trouble-free transition from community college to university. Check with your community college

admissions office or the K-State admissions office for information on this program.

K-State also subscribes to the transfer articulation agreement with all 19 Kansas community colleges. Students who have received an associate of arts degree from a Kansas community college are guaranteed junior classification, and are not required to fulfill the KSU physical education concepts course requirement. All credits of an associate degree are not necessarily applicable toward a baccalaureate degree; additional freshman, sophomore, and general education courses may be required to meet degree requirements.

Transfer students should apply for admission approximately four to six months prior to the term they wish to enter.

Admission of undergraduate international applicants

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

University regulations require that international students and their dependents (if they are with the student) purchase or be in possession of a medical insurance policy or equivalent coverage. Medical insurance can be purchased on the campus or from other independent agencies. In addition a student health fee is mandatory for all students.

In most cases, international applicants seeking admission to Kansas State University must meet the same academic standards for admission as those required of native students. There are wide variations, however, between educational systems throughout the world that make exact comparisons of educational standards difficult. International applicants are selected on the basis of their prior academic work, English proficiency, probability of success in the chosen curriculum (as evidenced by prior work in the academic area involved), and certification of adequate financial resources.

In addition to submitting copies of secondary school records and, when applicable, college transcripts, international students must submit scores from the Test of English as a Foreign Language (TOEFL). TOEFL scores are required of international students who:

1. Have completed their secondary education in a country where English is not the native language.
2. Have completed fewer than two years study in a United States high school.

3. Have completed fewer than two years (60 semester hours) of training in an accredited United States college or university.

A minimum score of 550 on the TOEFL is required for admission. Proficiency also may be demonstrated by passing a full academic year of college-level freshman English (i.e., equivalent to ENGL 100 and ENGL 120) with a grade of C or better at an accredited institution of higher education in the United States.

Students studying in the United States must submit required admissions materials and credentials to the Office of Admissions at least three months prior to the beginning of the semester for which application is being made. Students outside the United States must submit admissions material at least six months in advance. All appropriate immigration standards and requirements must be met.

Awarding of advanced standing credit to international students

International students are admitted to the freshmen level at Kansas State University with no award of credit for previous academic work. It is possible to receive academic credit by validation for comparable courses successfully completed in the student's home country. The following methods are used by Kansas State University to validate the awarding of advanced standing credit for international students who have completed work in their home countries at the postsecondary level:

1. Validation by a comparable credit-granting department at Kansas State University. Validation by one of the following two options will be at the discretion of the credit-granting department.

Option A—Course-by-course evaluation examination by comparable KSU academic department.

Option B—The advisor and/or academic dean's office makes a preliminary evaluation of the level a student has completed and begins the student at that level. Upon successful completion of that course, all related lower-level courses in that area, as determined by the department granting credit, would be validated and credit awarded.

2. Credit is granted based upon recommendation by recognized academic publications, primarily the *World Education Series* of American Association of Collegiate Registrars and Admissions Officers.

English proficiency

English is the language of instruction at Kansas State University. All undergraduate students whose primary language is not English must show proficiency in English before being admitted. If our review of the

student's proficiency level indicates inadequate preparation he or she may be offered one of the following conditional admissions:

1. Full-time study in the English Language program before pursuing academic studies.
2. A combination of part-time study in the English Language Program and part-time study in his or her academic area.

During the registration period at the beginning of each semester all new undergraduate students (including transfer students) whose natural language is not English are required to take Written Proficiency and spoken proficiency tests. These students may not participate in the enrollment process until results of these tests are made available to academic advisors. The purpose of the tests is to identify students who may need help in increasing their English proficiency so that they can realistically profit from their academic pursuits at Kansas State University. The director of the English Language program will recommend appropriate enrollment options based on the test results. These recommendations could include one of the following:

1. Full-time study in the English Language Program until adequate proficiency is demonstrated.
2. A combination of part-time study (6 hours) in the English Language Program and part-time study (6 hours) in the academic area until adequate proficiency for full-time academic study is demonstrated.
3. Full enrollment in the academic program with no English language requirements.

Non-degree seeking students

Students who have not participated in formal education for some time or students who do not intend to become candidates for a degree may enroll for credit in undergraduate courses as students in special status. International students do not qualify for this option.

Students applying for this non-degree status need to submit an application for admission and a \$15 nonrefundable application fee. Test scores and transcripts may not be required. However, students must provide an indication of their ability to successfully complete college-level study as determined by admissions officers.

Those admitted as non-degree students will be allowed to complete a maximum of 15 semester hours in this status. In order to pursue work beyond the semester in which the 15th hour is completed, students must apply for regular admission to the director of admissions and meet all requirements for regular admission.

Under certain circumstances, outstanding high school students are admitted as non-degree students to take several courses during the senior year. To be considered for such admission, a student must have the recommendation of the high school principal and have an outstanding high school academic record.

Adults who are not high school graduates are sometimes admitted if the high school work they completed was of good quality, or if they show promise of collegiate success as evidenced by scores on the American College Test battery.

Non-degree students are subject to regulations for regular students, and are responsible for payment of all fees, regular attendance at classes, and maintenance of satisfactory standing.

American College Test (ACT)

Freshman applicants to KSU are required to take the ACT and to have their test scores forwarded to the University. The test should be taken on one of the national test dates throughout the year, preferably in October. Numerous test centers are available throughout the state and nation. Further information about the ACT can be obtained from your high school counselor or principal.

Fraudulent applications

Individuals who provide fraudulent information on applications for undergraduate admissions or readmissions are subject to immediate dismissal from the University. The decision for immediate dismissal will be made by the director of admissions. This decision will be made after a complete and thorough review of the situation and an individual conference with the student involved. The individual dismissed has the right to appeal the decision to the Admissions and Enrollment committee, whose decision will be final.

Credit by examination

Many opportunities exist at Kansas State University to earn college credit by examination. KSU participates in the College Level Examination Program (CLEP), Proficiency Examination (PEP), DANTES, high school International Baccalaureate, and the College Board high school Advanced Placement Testing Program. Local examinations (quiz outs) also are given in many course areas by individual departments within the University. See the following sections for more information about departmental exams.

Details concerning testing opportunities at KSU are available on request from the Office of Admissions, 119 Anderson Hall, Manhattan, Kansas 66506-0102, or Academic Assistance Center, 101 Holton Hall, Manhattan, Kansas 66506-1307. Also see the catalog section on the Academic Assistance Center.

Enrollment

Donald E. Foster, University Registrar
118 Anderson Hall
532-6254

New student enrollment for the fall semester takes place in early summer. Admitted students are scheduled on specific days during this period. New students also may enroll during the August enrollment period.

Academic advising

Each new student is assigned an academic advisor at the beginning of the school year. The academic advisor assists the student in defining goals to be reached in college; gives information regarding curricula, courses, career, and graduate school; and discusses personal problems the student may have, especially problems related to the student's progress and plans for subsequent work.

In order to assist academic advisors, students are expected to complete the ACT Assessment Program before enrolling and to participate in pre-enrollment/orientation programs. In addition, students are expected to schedule appointments with their academic advisors before pre-enrollment and at other times throughout the semester as needed. Students must inform their advisors of any special needs or deficiencies which might affect course performance or placement, or threaten academic success. Students are expected to know academic policies, procedures, and degree requirements and to remain informed about their progress in meeting these requirements. Students are further encouraged to seek assistance as needed from the academic and student support services provided by the University.

Pre-law advising

While the Association of American Law Schools does not specify a particular pre-law curriculum, it does emphasize the selection of rigorous courses that will enable students to achieve comprehension and expression in words; critical understanding of the human institutions and values with which the law deals; and creative power in thinking. The development of these capacities is a highly individualized process vigorously pursued in a variety of disciplines and degrees. Students in all majors who are considering law study should consult with the K-State pre-law advisor in the dean's office of the College of Arts and Sciences as early as possible in their undergraduate careers. Also see catalog information on pre-law studies in the Colleges of Arts and Sciences, Business Administration, Engineering, and Human Ecology.

Medical history

Board of Regents' regulations require all new students to submit a medical history form to Lafene Health Center prior to registration.

Extension and correspondence credit

College-level credit earned through accredited extension divisions may be applied toward credit requirements for a degree at KSU. The credit must be applicable to the curriculum chosen and the amount of credit that can be used is limited. For example, in the College of Arts and Sciences a maximum of 30 semester hours of acceptable correspondence and/or extension work may be applied toward a degree.

Credit by departmental examination

Any student who has enrolled at KSU is eligible to gain undergraduate credit by departmental examination. Credit may be granted for any course with the consent of the head of the department offering credit for that subject. Permission is granted only if the student has prepared for the examination. The examination must be taken under the supervision of the head of the department in which the course is given. Credit earned is considered resident credit.

Credit by examination may receive letter grades of A, B, C, or D, or a notation "credit" as determined by the department. The credit will be treated as resident credit and such graded work will receive grade points to be computed in the student's GPA. Nongraded credit by examination shall be treated as graded hours in implementing A/Pass/F policy.

Military training

Reserve Officer Training is offered by both the Air Force and Army. Students may enter the program during their freshman or sophomore years. Students with two or more years remaining, including graduate work, may qualify for the ROTC two-year program. Junior and senior students who qualify for the advanced ROTC program are paid \$100 per month subsistence. Advanced ROTC includes summer training at a military base. Successful completion of the advanced program and a University degree earn the student a commission as a second lieutenant.

Scholarships are awarded on a competitive basis to entering freshmen, sophomores, and juniors. ROTC scholarships pay University tuition, fees, an allowance for books and supplies, and a monthly subsistence of \$100.

Academic credit may be applied to requirements for a degree. Check with the appropriate dean's office for the college requirements.

Military evaluation for credit

An evaluation of military training and experience is conducted in the Office of Admissions for a fee of \$25. A student must be currently enrolled in order to be awarded credit resulting from a military evaluation.

Fee covers evaluation of documents to include DD-214, DD-295, certificates of completion, Defense Language Institute transcripts, Community College of the Air Force transcripts, Academy of Health Sciences at Fort Sam Houston transcripts, and AARTS transcripts.

In general, the University follows the recommendation given in "A Guide to the Evaluation of Educational Experiences in the Armed Services" published by the American Council on Education insofar as these recommendations apply to a student's degree program.

Military correspondence courses and courses which last less than two weeks are not recognized for college-level credit. Active military personnel may have their current, primary MOS evaluated, provided it has been validated by an SQT score or performance evaluation within the last 12 months.

Credits resulting from military evaluations granted by other institutions are not transferable to K-State. Kansas State University does not award physical education credit for basic training. Credit in military science is granted based on length of time in service and rank upon discharge.

The grade of CR, or credit, is assigned to all awarded credit.

Assignment to classes

Students are responsible for fulfilling all requirements of the curriculum in which they are enrolled. They should consult with their advisors or deans in planning their work. Students should be familiar with *KSU General Catalog* statements about assignments and curricula.

A catalog is given to new each student and copies are maintained for student use in the Office of Admissions, all deans' offices, Farrell Library, and all departmental offices. Catalogs may also be purchased at the K-State Union Bookstore.

No student is officially enrolled in classes or for private lessons in music or other subjects until a formal class assignment is completed. **No assignment is complete until all fees and charges are paid.**

A student may not enroll later than 10 class days after the beginning of a semester (five days for summer session) except by permission of the dean. Students should enroll during regularly scheduled registration periods in order to avoid late fees.

An undergraduate student may not enroll for more than 19 Kansas State University credit hours in a semester unless the student is granted permission to do so by the student's academic dean or the dean's representative. If the published curriculum of a college or department in which the student is enrolled requires that more than 19 KSU credit hours be taken during a semester, this section does not apply.

Full-time faculty members and regular employees, with approval of their department heads or deans, may enroll in graduate or undergraduate work not to exceed 6 credit hours in fall and spring semesters or 3 credit hours during the summer session.

A student who has paid full fees on campus and who wishes to take a course through the Division of Continuing Education may receive a continuing education fee waiver except in cases of self-supporting courses (e.g., intercession or non-base), contingent on the college dean's approval for the additional hours, and final authorization by continuing education staff. Credit courses administered by the Division of Continuing Education award regular University credit and are included in the credit limits established in the preceding paragraph.

Late enrollment

A student who seeks to enter the University later than 10 calendar days after the start of the semester is admitted only by special permission of the student's dean. Those who enroll after the regular registration period and up through the 20th day (10th for summer term eight-week course) of class pay a late enrollment fee of \$15. However, anyone enrolling after the 20th day (10th for summer term eight-week course) of class must pay a \$35 late enrollment fee.

Dropping and adding courses

If a student wants to drop or add a course or if an instructor recommends a change, the student should confer with an advisor.

The last day for dropping a course without a W being recorded is at the end of the 25th day of classes. After the 10th week of classes, courses may not be dropped. In cases where courses are shorter than the full semester, deadlines will be applied pro rata.

A summer term eight-week course may be dropped without a W being recorded through the thirteenth day; after the fifth week a full term course may not be dropped.

The instructor **may** drop a student from a course after the first week of classes if the student has neither attended any of the scheduled class meetings nor notified the instructor of his or her intent to take the course. For purposes of this procedure enrollment in and payment of tuition for a course **does not** constitute sufficient notification of intent to take a course.

No student may add a course after the first week of classes without the permission of the instructor.

Students desiring to transfer from one college to another within the University should confer with both deans concerned.

Retake policy

Undergraduate students may retake courses in order to improve the grade. If a course is retaken, the original grade is lined out and removed from the grade point average and a retake notice is inserted. Retakes can be accomplished only by re-enrolling in and completing a KSU resident course. Courses originally taken on a letter grade basis may be retaken on an A/Pass/F basis if appropriate, or if originally taken on an A/Pass/F basis may be retaken on a letter grade basis. The retake grade will always be used in the grade point average computation regardless of whether it is higher or lower than the original grade.

Although there is no limit to the number of times a course may be retaken, a student may retake a course with subsequent removal of the prior grade from calculation of the grade point average only once for each course, and for a total of five courses during the student's academic career at KSU. Any grades obtained from retaking courses beyond these limitations will be used in calculating the grade point average. A retaken course will count only once toward meeting degree requirements. Courses retaken before fall 1986 will not be used in determining whether five courses have been retaken.

Any course retaken after completion of a bachelor's degree shall not affect the credits or the GPA applied to that degree.

A/Pass/F policy

Undergraduate students, except first-semester freshmen and students on probation, may enroll in certain courses (if normal prerequisites have not been met) under the A/Pass/F grading option. Under this option, a student earning a grade of A in a course will have an A recorded on the transcript for that course; a grade of B, C, or D will be recorded as Pass; a grade of F will be recorded as F.

Students should be aware that some schools, scholarship committees, and honorary societies do not find work taken on a nongraded basis (Pass) acceptable.

Furthermore, many employers do not view nongraded (Pass) course work favorably. All students, especially those without a declared major, should be cautious in using the A/Pass/F option.

Each department or division may specify which courses its majors may take under the A/Pass/F option consistent with the University requirements listed below.

1. A student may enroll under the A/Pass/F option for any free elective course offered under this option, that is, in any course which is in no way specified even in general terms in his or her curriculum. Courses which are specified by name or number and courses which meet general distribution requirements are not considered free electives.
2. A student may enroll under the A/Pass/F option for any general distribution requirement offered under this option, provided the course is in the upper division level (300 and above). General distribution requirements consist of those courses which are listed by areas, for example, three courses in the humanities.
3. A student may not enroll under the A/Pass/F option in any course which is required by name or number as part of his or her degree program.

It is the responsibility of a student requesting enrollment under the A/Pass/F option to be sure that such an enrollment is valid in the declared degree program. A course originally completed under the A/Pass/F option **may not** be converted at any time to a graded basis.

Undergraduate students may submit Pass hours for graduation requirements up to and not exceeding one-sixth of the total number of hours required for a bachelor's degree. That is, five-sixths of all hours submitted for the bachelor's degree must be hours submitted on a graded or credit basis.

Students may request the A/Pass/F option for eligible courses during the third and fourth weeks of each regular semester or during the second week of the summer semester. Students requesting the use of the A/Pass/F option must obtain the signature of their advisors. The decision by a student to use the A/Pass/F option is treated with strict confidentiality.

Credit/No Credit courses

Certain courses for which the learning experience is based primarily on participation and/or attendance may be offered solely on a Credit/No Credit basis. No grades are given for such courses.

For courses that are normally given for a grade, the designation Credit may be obtained in the case of credit by examination. (See Credit by Departmental Examination earlier in this section.)

Courses in research numbered 898 (report), 899 (thesis), and 999 (dissertation) are offered on a Credit/No Credit basis.

Class attendance

Class attendance policies shall be determined by the instructor of each course. Instructors will determine if, and the manner in which, work and exams missed may be made up.

Withdrawal from the University

A student who withdraws from the University must have an official withdrawal permit from the appropriate dean.

If a student withdraws during the first 25 days of the semester, no mark will be recorded. Thereafter, a mark of W is recorded. A student may not withdraw after the end of the 10th week of the semester.

A student who finds it necessary to withdraw from the University for verifiable nonacademic reasons after the 10th week should consult the office of the appropriate dean.

Auditing classes

Auditing is attending a class regularly, without participating in class work or receiving credit. Auditing is permitted on a space-available basis. Permission to audit a class is granted by the instructor, with the approval of the dean of the college in which the class is offered. Laboratory, continuing education, and activity courses may not be audited. An audit is not recorded on the permanent record. Students should not enroll in courses they plan to audit. Students 60 years or older may audit on a no-fee, space-available basis.

Dead week

The week before the final examination period (known as dead week) is set aside as a period of curtailed social activity. No examinations, other than weekly laboratory quizzes, studio, or language proficiency examinations, may be given during the last five calendar days before final examinations.

Dead day

In fall semesters there is a weekend between the end of regularly scheduled classes and the beginning of final examinations. In spring semesters a single day, called dead day, is allowed between the end of classes and the beginning of final exams. Dead day ends at 4:30 p.m. Normally classes end on Wednesday, dead day is Thursday, and exams begin on Thursday at 7 p.m.

Final examinations

A final examination period during which no regular classes meet is scheduled at the end of the fall and spring semesters. Final examinations are given during this period. There is no specially scheduled period for final examinations in the summer session.

Except for honors, problems, seminar, report, research, language and fine arts performance, and theses courses, the last examination (last unit test or comprehensive test) in a course must be given during the examination period specified by the University Admissions and Enrollment Committee. The final examination schedule is published in the *Class Schedule*. Classes may have take-home examinations, projects, papers (excluding term papers), or other media, in lieu of written final examinations as the last evaluation instrument in the class. In such instances, a deadline for submittal of the medium may not be earlier than the time of the end of the courses scheduled examination period as published in the *Class Schedule*.

Fees

Keith L. Ratzloff, Controller

Fees subject to change

The following schedule of fees was in effect when this catalog was prepared. However, there is no guarantee this schedule will not be changed without notice before the beginning of any semester or summer session.

Payment of fees

With the exceptions noted below, students must pay the total amount of their semester or summer session fees on the day they register and should use a check for exact amount of fees, MasterCard, or VISA. For students' safety, cash and checks requiring change are discouraged.

Exceptions: If the student's eligibility to receive financial aid is verifiable prior to the student's fee payment due date, the director of Student Financial Assistance may authorize the deferment of payment of tuition and fees in accordance with the Board of Regents Policy and Procedures Manual (Chapter 2, Section E). A late fee of \$15 is assessed if the student failed to submit a complete financial aid application at least 45 days prior to the student's scheduled fee payment date. The student may defer payment of tuition and fees up to one month (two weeks for summer) when mitigating circumstances support such decisions and an application for deferment has been completed. Late fees are applicable. The student's obligation to pay regularly assessed tuition and fees is not reduced by an approval to defer payment.

Late registration fees are assessed for students who register or pay their fees after the regular registration period.

Students enrolled on a per-credit-hour basis or changing from 6 or fewer to 7 or more credit hours will be assessed for all hours in which they are enrolled, including those for which the grade of W is recorded. Students withdrawing from courses are eligible for refunds in accordance with the refund policy.

Students receiving scholarships or grants not processed through the KSU Office of Student Financial Assistance before registration will be required to pay the full amount of their fees from personal resources on the day they register.

Returned checks

Checks accepted for fee payment which are returned uncollectible by financial institutions will be subject to a \$10 charge, in addition to all other fees.

Withholding student records

The University withholds students' academic records for nonpayment of fees,

loans, and other appropriate charges and for nonreturn of University property.

Incidental fee

This fee is the student's contribution toward the costs of instruction and covers approximately twenty to twenty-five percent of the instructional costs.

Educational Opportunity Fund fee

This fee is used to aid the academic achievement and progress of underrepresented K-State students.

Student services support fee

This fee is used to finance adaptation and equipping of Holton Hall for improved delivery of student services programs.

Student health fee

For a description of the services provided by this fee, see the section on Lafene Health Center later in this catalog.

K-State Union repair and replacement fee

This fee is used for repairs and replacements at the K-State Union building.

Student fee revenue bonds

This fee is used to retire the refunding bonds, Series 1985 and the Bramlage Coliseum revenue bonds. The refunding bonds advance refunded the outstanding balance of the Student Union Annex I bonds, Student Union Annex II bonds, Stadium revenue bonds, and the Student Recreational Building bond.

Recreational Building program

This fee is used for the administration, support, and operation of the student Recreational Building programs.

Activity fee

This fee is used for numerous student functions which include a broad range of student interests and activities. Those enrolling in 6 or fewer credit hours do not pay a full activities fee and are not entitled to student ticket rates for certain activities.

K-State Union fee

This fee is used for the administration, support, and operation of the student K-State Union.

Student publications fee

This fee is used to support the *Collegian* and *Royal Purple*.

Recreational Services fee

This fee is used to support the Chester E. Peters Complex (equipment, interior upkeep, supplies, etc.).

KSDB-FM fee

This fee is used to support the student radio station (equipment, means of service to operate the station, recent upgrade of power wattage, etc.).

Schedule of Fees

The following schedule of fees was in effect when this catalog was prepared.

Contracts and compensatory charge

This schedule does not limit the charges which may be collected under arrangements with other governmental or private agencies, except that such arrangements may not provide for lesser charges. Compensatory or other charges to more nearly cover the actual cost of instruction are specifically authorized.

Students enrolled in 7 or more semester credit hours:

| | Resident | Non-resident |
|---|-------------------|-------------------|
| Incidental fee (based on student classification) | | |
| Undergraduate | \$ 578.00 | \$1,977.00 |
| Graduate | 728.00 | 2,127.00 |
| Veterinary Medicine | 1,424.00 | 4,272.00 |
| Special fees | | |
| Educational Opportunity Fund | 6.00b | 6.00b |
| Student Services Support | 3.00b | 3.00b |
| Student Health | 75.00ab | 75.00ab |
| K-State Union Repair and Replacement | 1.25b | 1.25b |
| Student Fee Revenue Bonds: | | |
| Refunding Bonds | | |
| (Stadium, Union, Recreation Bldg.) | 22.25b | 22.25b |
| Coliseum Bonds | 8.25b | 8.25b |
| Recreational Building Program | 3.00b | 3.00b |
| Activity Fee | 8.20b | 8.20b |
| K-State Union | 17.00b | 17.00b |
| Student Publications | 4.80b | 4.80b |
| Recreational Services | 3.00b | 3.00b |
| KSDB-FM | .85b | .85b |
| Total Undergraduate | <u>\$ 730.60</u> | <u>\$2,129.60</u> |
| Total Graduate | <u>\$ 880.60</u> | <u>\$2,279.60</u> |
| Total Veterinary Medicine | <u>\$1,576.60</u> | <u>\$4,424.60</u> |

Students enrolled in 6 or fewer semester credit hours:

| | Resident | Non-resident |
|---|----------|--------------|
| Incidental fee (based on student classification) | | |
| Undergraduate per credit hour | \$39.00 | \$132.00 |
| Graduate per credit hour | 49.00 | 142.00 |
| Veterinary Medicine per credit hour | 95.00 | 285.00 |
| Special fees | | |
| Educational Opportunity Fund total fee | 3.00 | 3.00 |
| Student Services Support total fee | 1.00 | 1.00 |
| Student Health total fee | 25.00a | 25.00a |
| K-State Union Repair and Replacement total fee | .80 | .80 |
| Student Fee Revenue Bonds: | | |
| Refunding Bonds | | |
| (Stadium, Union, Recreation Bldg.) total fee | 12.50 | 12.50 |
| Coliseum Bonds total fee | 3.75 | 3.75 |
| Recreational Building Program total fee | 1.00 | 1.00 |
| Activity Fee total fee | 4.55c | 4.55c |
| K-State Union total fee | 8.50 | 8.50 |
| Student Publications total fee | 2.40 | 2.40 |
| Recreational Services total fee | 1.50 | 1.50 |
| KSDB-FM total fee | .50 | .50 |

Fees per summer session (based on student classification)

| | Resident | Non-resident |
|-------------------------------------|----------|--------------|
| Incidental fee | | |
| Undergraduate per credit hour | \$39.00 | \$132.00 |
| Graduate per credit hour | 49.00 | 142.00 |
| Veterinary Medicine per credit hour | 95.00 | 285.00 |
| Special fees per credit hour | 12.10d | 12.10d |

Auditing

Auditing, permitted on a space-available basis, allows class attendance without participation or credit upon recommendation of the instructor and approval of the dean. This privilege is not applicable to laboratory and Continuing Education courses:

| | | |
|-------------------------------------|---------|----------|
| Undergraduate per credit hour | \$39.00 | \$132.00 |
| Graduate per credit hour | 49.00 | 142.00 |
| Veterinary Medicine per credit hour | 95.00 | 285.00 |

^aStudents enrolled in a spring semester but not attending summer school may use Lafene Health Center services during the summer by paying a \$20 fee prior to the first day of summer school classes. After the start of classes the fee for such students will be \$25, payable during the first visit to the health center. Students who have paid their health fees may elect to have their spouses covered if they pay, within 10 days of their own health fee payment, a spouse fee of \$75 for a semester, or \$20 or \$25 (as appropriate) for a summer session.

^bStudents paying the full incidental fee who will be attending classes at off-campus locations during an entire semester and who will reside outside of a 30-mile radius of Manhattan during that semester may elect to be exempted from the Student Health fee and all Student Service fees.

^cNot a full activity fee and does not entitle students to student ticket rates for certain activities, such as athletic events.

^dThe summer session special fees are assessed only on the first 6 credit hours for each summer session and are not applicable to students enrolled in formally organized classes actually conducted at off-campus locations. Includes Educational Opportunity Fund, Student Services Support, Student Health, Student Fee Revenue Bonds (Refunding and Coliseum Bonds), Recreational Building Program, Activity, K-State Union, Student Publications, Recreational Services, and KSDB-FM.

Off-campus courses# (Based on course level)

| | |
|----------------------|--|
| Graduate Credit | \$73.00 per semester hour |
| Undergraduate Credit | \$52.00 per semester hour |
| No Credit | \$52.00 per semester hour |
| Non-Credit Courses | Vary to correspond with total direct costs |

#As approved by the Board of Regents on January 18, 1974, off-campus courses may be offered for either resident or extension credit. Resident credit will be awarded only with the approval of the appropriate campus faculty council. (For off-campus courses, the established off-campus fees per credit hour for undergraduate and graduate courses are to be collected and an amount equal to the on-campus incidental fee per credit hour deposited to the general fee fund.)

On-campus fees administered through the Division of Continuing Education

| Credit | | Resident | Non-resident |
|---|-----------------|--|--------------|
| Incidental fee | | | |
| Undergraduate | per credit hour | \$39.00 | \$132.00 |
| Graduate | per credit hour | 49.00 | 142.00 |
| Veterinary | | | |
| Medicine | per credit hour | 95.00 | 285.00 |
| Coordination fee | per credit hour | 10.00 | 10.00 |
| Non-credit | | | |
| Incidental fee | | Vary to correspond with total direct costs | |
| Coordination fee | | Vary to correspond with total direct costs | |
| Student fees (both credit and applicable non-credit courses) | | | |
| Activity Fees | per day | \$1.80* | \$1.80* |
| Health Fees | per day | \$1.00** | \$1.00** |

*To a maximum of the part-time activity fee of \$39.50 per semester

**To a maximum of \$25 per semester

Conferences, institutes, and seminars

| | |
|--------------|--|
| (Non-Credit) | Vary to correspond with total direct costs |
|--------------|--|

Field camps

| | |
|--|----------|
| Summer field camps in geology, archaeology | \$300.00 |
|--|----------|

Application for admission processing fees (not subject to refund)**Undergraduate applications**

| | |
|--|---------|
| For first-time admission to undergraduate programs (effective fall 1990) | \$15.00 |
| For international students to undergraduate programs | \$40.00 |

Graduate applications

| | |
|--|---------|
| For post-baccalaureate programs in the Departments of Architecture, Landscape Architecture, and Regional and Community Planning (not applicable to other fees) | \$15.00 |
| For post-baccalaureate programs in Veterinary Medicine and Business Administration | \$25.00 |
| For international students to graduate programs (except Business Administration) | \$25.00 |
| For international students to post-baccalaureate programs in Business Administration | \$30.00 |

Private music lessons

University students enrolled in a degree program with a major in music, music education, or applied music and dual majors in music and theatre are exempt from fees for private music lessons.

For other students enrolled in credit courses, fees are payable in advance and are as follows (Enrollment subject to availability of staff and facilities.)

| | University Students |
|-------------------------------------|---------------------|
| Two 30-minute lessons a week | |
| Semester | \$75.00 |
| Summer session | \$37.00 |
| One 30-minute lesson a week | |
| Semester | 45.00 |
| Summer session | 22.50 |
| Single lessons, per lesson | |
| Practice piano | |
| Semester, 1 hour daily | 9.00 |
| Summer session, 2 hours daily | 9.00 |
| Practice organ, two-manual | |
| Semester, 1 hour daily | 18.00 |
| Summer session, 2 hours daily | 18.00 |
| Practice organ, three-manual | |
| Semester, 1 hour daily | 37.50 |
| Summer session, 2 hours daily | 37.50 |

Late registration or fee payment (Not subject to refund)

| | |
|--|------|
| After regular registration through 20th day of classes | \$15 |
| After 20th day of classes | \$35 |

Exceptions: The \$15 fee begins after last regular evening registration if registering for evening classes only; after the starting date for late-starting classes; and after the first Friday of classes for faculty, staff, and public school teachers. When registering by mail or exclusively for research, seminar, or field study, the \$15 fee begins 15 calendar days after and the \$35 fee begins 30 calendar days after notification of the amount due. For summer sessions, the fee increases from \$15 to \$35 after the 10th day of classes. Late fees do not apply to corrections of fee assessments.

Study abroad program fee (not subject to refund)

| | |
|---|------|
| Administrative fee per semester or summer term for each student enrolled in a study abroad program not taught or conducted by Kansas State University faculty | \$25 |
|---|------|

Military training and experience evaluation

| | |
|--|------|
| Administrative fee for evaluating the military training and experience of a student to determine college-level equivalency | \$25 |
|--|------|

Additional fees

| | |
|--|--|
| Copies of public documents At cost | |
| Laboratory courses Cost of breakage | |
| Parking misuse fees As filed in the Regents' Office | |
| Interlibrary loan and other charges As appropriate when authorized | |
| Library misuse fees As appropriate when authorized | |
| Loans and related interest and charges As appropriate when authorized | |
| Rental and use fees for recreational equipment As appropriate when authorized | |
| Returned check fee \$10 per check | |
| ROTC property As appropriate when authorized | |
| Student health services As appropriate when authorized | |
| Transcript fee \$2 per transcript | |
| Student identification card replacement \$5 per each replacement | |
| Student fee receipt replacement \$1 per each replacement | |

Administrative service fee for all students applying for federal Stafford Loans
\$10 per academic year

Students are required to reimburse the institution for the cost of (a) excess breakage and wastage of materials and (b) materials used in excess of those required for completion of course work.

American Institute of Baking students

Students enrolled in a regular semester at the American Institute of Baking will be considered adjunct students by paying the fees, other than the incidental fee, under "Students enrolled in 7 or more hours" and will be entitled to use the Lafene Student Health Center, K-State Union, and Recreational Building, and to purchase tickets for athletic and cultural events at student prices.

People eligible for resident fees:**1. Residents**

Usually includes adults who have been residents of Kansas for 12 months or longer prior to registering for any semester or session and minors of parents who meet these residency requirements. The official residency determination for fee purposes is made by the Office of the Registrar.

2. Employees

a. Employees for universities under the Kansas Board of Regents, other than hourly student employees, working four-tenths time or more as follows:

For fall semesters—More than half of September and all of October and November pay periods.

For spring semesters—More than half of February and all of March and April pay periods.

For summer sessions—Part of June and all of July pay periods, or more than half of February and all of March and April pay periods preceding the summer sessions.

Exceptions to the above requirements can be made for the term in which a graduate degree is awarded. (Pay periods start on the 18th of the preceding month and end on the following 17th, e.g., September pay period starts August 18 and ends September 17.)

b. Employees of the federal government given adjunct appointments at Kansas State University or assigned to one of the ROTC units at Kansas State University.

3. Military

a. Military personnel stationed and living in Kansas except military personnel assigned to Kansas State University as full-time students.

b. Persons domiciled in Kansas immediately upon discharge or retirement from active military service at a Kansas installation.

4. Dependents

Dependent spouses and children of the employees and military personnel defined above.

5. Exchange students from Missouri

Students eligible to pay resident fees at the University of Missouri who are enrolled in the following programs at Kansas State University: Bachelor and Master of Architecture; B.S. in Architectural Engineering; B.S., M.S., and Ph.D. in bakery science and management; B.S. in construction science; B.S., M.S., and Ph.D. in milling science and management.

This privilege is granted in exchange for resident fees for Kansas students arbitrated by Kansas Board of Regents and Missouri Board of Education.

6. Kansas high school graduates

Students who have graduated from an accredited Kansas high school within 12 months of enrollment at KSU.

7. Recruited/transferred employees

People who have been recruited to Kansas employment or transferred to a Kansas location and their dependents.

Refund Policy

The following table applies to students who completely withdraw from a semester, summer session, field geology, or private music lessons and to the reduction, if any, in fees for students who reduce their enrollment. The activity, K-State Union, Student Publications, Recreational Services, and KSDB-FM fees are refunded only if the student fee receipt is returned. Refunds will not be made until sufficient time has lapsed to ensure that fee payment checks have been honored by the bank—usually 15 days after student pays.

Withdrawal

| | |
|--|-------------|
| Through the last business day prior to the first day of classes or the last day of regularly scheduled fee payment (whichever comes first) | 100% refund |
|--|-------------|

16 week semester

| | |
|-------------------|-----------|
| Through week two | 90% |
| Through week four | 50% |
| After week four | No refund |

Summer sessions

| | |
|------------------|-----------|
| Through week one | 90% |
| Through week two | 50% |
| After week two | No refund |

For courses less than 5 weeks, 100% refund will be given through the day after the class begins. No refund will be given after that time.

Continuing education refunds**Extension credit courses**

100% refund if requested prior to second class meeting or if the course is cancelled.

50% refund if requested after the second class meeting.

No refund if requested after one-third of the scheduled class meetings.

Extension class fees are not transferable.

Extension non-credit courses

Fees are non-refundable unless, subsequent to acceptance of the fees, the service, at the option of the University, is not provided.

Conference, institutes, and seminars

100% refund if cancellation of registration is received by official notification at least 48 hours prior to the time of the scheduled event.

No refund for cancellations received later than 48 hours before the time of the scheduled event.

Other expenses

In addition to the applicable fees, students are required to purchase textbooks, drawing instruments, and other personal equipment and supplies when needed for courses in the curriculum chosen. Costs will vary each semester, but are estimated to approximate the following:

| | |
|---|---------|
| Enrollment fees for an undergraduate Kansas resident | \$ 781* |
| Books and supplies, approximately | 255 |
| Room and board in University housing | 1,270 |
| Clothing, laundry, postage, travel, extra meals, phone, social activities (varies with the individual), miscellaneous | 1,169 |
| Total estimated expenses (half of academic year) | \$3,475 |

*Fees for graduate, veterinary medicine, and nonresident students are shown earlier in this section.

Undergraduate Degrees

Common degree requirements

The common requirements for all curricula leading to an undergraduate degree are: English Composition, 6 credits; Public Speaking, 2 credits; Principles of Physical Fitness, 1 credit.

Undergraduate degree requirements

To graduate, a student must complete a prescribed curriculum. Under special conditions substitutions are allowed as the interests of the student warrant. The total credit requirement for bachelor's degrees ranges from 120 to 167 hours, according to the curriculum taken.

There are two grade point averages a student must meet to be awarded an undergraduate degree: (1) at least 2.0 on KSU resident graded courses that are applied to the degree, and (2) at least a 2.0 cumulative GPA for all resident graded courses taken at KSU. Professional curricula may impose additional degree requirements.

Undergraduate students must file an application for graduation clearance in the appropriate college dean's office during the first four weeks of the semester (first two weeks for summer) in which the degree is to be completed.

It is the student's responsibility to be certain that transcripts from all transfer institutions are on file in the University Registrar's Office before the end of the semester or summer session the degree requirements will be completed.

Up to half of the credits required for a normal four-year undergraduate degree may be completed at an accredited two-year college.

Each student must complete at least 30 resident credits to be considered for a degree. Further, the student must complete 20 of the last 30 hours of resident undergraduate credit at KSU. Courses in the student's major field shall be taken in residence unless an exception is granted by the major department on petition of the student. That department shall have jurisdiction over the acceptance of major courses by transfer for fulfillment of the major requirement.

Exceptions to the residence requirement of the final year may be made by the dean of the college and the department head in the student's major field if the student has completed a total of three years of work acceptable to KSU. The student must submit satisfactory plans and reasons for completing the degree requirements at another institution, such as a dental, medical, law, or medical technology school, before earning a degree here.

Resident work includes all regularly scheduled class or laboratory instruction given by the regular University faculty.

At least five-sixths of the credit hours taken at KSU and applied toward a bachelor's degree must be graded hours. Required courses of an internship or practicum nature or credit by examination, offered on a Credit/No Credit basis only, are to be considered as graded hours in implementing the five-sixths policy.

Candidates for spring graduation are urged to attend commencement. Fall graduates are invited to participate in the commencement exercises in December or the following spring. Prospective summer graduates may participate in the spring exercises before graduation. All participants must wear the appropriate cap and gown.

Students generally complete degree requirements in the normal four or five academic years allotted for that purpose. However, it could take additional time because of a significant change of educational objective. A student may interrupt studies for one or more semesters. Normally, the student will be expected to complete the degree program in not more than two years beyond the scheduled time. The individual whose education has been interrupted may have to meet new degree requirements if a change has occurred.

Dual degrees

Students may elect in some cases to earn two degrees at the same time. A minimum of 150 credit hours must be completed and the requirements for both colleges must be satisfied. Students should confer with each academic dean as early as possible to determine appropriate programs of study.

Each student who is eligible to graduate must file an application for graduation in the academic dean's office during the first four weeks of the semester he or she plans to complete degree requirements. Summer graduates must file their applications for graduation during the first two weeks of the summer session.

Mathematics entry requirements

The degrees shown below are conferred on completion of the prescribed curricula. The letter which precedes each curriculum indicates the suggested high school math courses, listed below. It is recommended that entering freshmen have completed these suggested mathematics courses.

- (A) One unit of algebra, or one unit of geometry, or a unit involving the combination of these, or approved substitute
- (B) One unit of algebra
- (C) Two units of algebra
- (D) One unit of algebra and one unit of geometry

- (E) One and one-half units of algebra and one unit of geometry
- (F) Two units of algebra, one unit of geometry, and one-half unit of trigonometry

Undergraduate degrees

College of Agriculture

Bachelor of science in agriculture

- (E) Agricultural economics
- (E) Agricultural education
- (E) Agricultural journalism
- (E) Agricultural mechanization
- (E) Agronomy (crops and soils)
- (E) Animal sciences and industry
- (E) Bakery science and management (B.S. in bakery science and management)
- (E) Crop protection
- (E) Feed science and management (B.S. in feed science and management)
- (E) Food science and industry (B.S. in food science and industry)
- (E) Horticulture
- (E) Horticultural therapy
- (E) Milling science and management (B.S. in milling science and management)
- (E) Park resources management
- (E) Pre-forestry (nondegree)
- (E) Pre-veterinary medicine (nondegree)
- (E) Retail floriculture (associate degree and certificate program)

College of Architecture and Design

- (F) Architecture—five years (bachelor of architecture)
- (F) Interior architecture—five years (bachelor of interior architecture)
- (F) Landscape architecture—five years (bachelor of landscape architecture)

College of Arts and Sciences

Bachelor of arts, bachelor of fine arts, bachelor of music, bachelor of music education, and bachelor of science

- (B) Anthropology, B.A. or B.S.
- (A) Art, B.A. or BFA
- (E) Biochemistry, B.A. or B.S.
- (E) Biology, B.A. or B.S.
- (E) Chemistry, B.A. or B.S.
 - General chemistry
 - Chemical science
- (B) Computer science, B.A. or B.S.
- (B) Economics, B.A. or B.S.
- (A) English, B.A.
- (E) Fisheries and wildlife biology, B.A. or B.S.
- (B) Geography, B.A. or B.S.
- (E) Geology, B.A. or B.S.
- (E) Geophysics, B.A. or B.S.
- (A) History, B.A. or B.S.
- (B) Information systems, B.A. or B.S.

Interdisciplinary studies

- (A) Humanities, B.A.
- (D) Life science, B.A. or B.S.
- (E) Physical science, B.A. or B.S.
- (A) Social science, B.A. or B.S.

(B) Journalism and mass communications, B.A. or B.S.

- (A) Leisure studies, B.A. or B.S.
- (F) Mathematics, B.A. or B.S.
- (E) Medical technology, B.A. or B.S.
- (E) Microbiology, B.A. or B.S.
- (A) Modern languages, B.A.
- (A) Music
 - Music, B.A.
 - Applied music, B.M.
 - Music education, B.M.E.
- (A) Philosophy, B.A. or B.S.
- (A) Physical education, B.A. or B.S.
- (E) Physics, B.A. or B.S.
- (B) Political science, B.A. or B.S.
- (E) Pre-dentistry, B.A. or B.S.
- (E) Pre-law (nondegree)
- (E) Pre-medicine, B.A. or B.S.
- (E) Pre-nursing (nondegree)
- (E) Pre-optometry (nondegree)
- (E) Pre-pharmacy (nondegree)
- (E) Pre-physical therapy (nondegree)
- (E) Pre-veterinary medicine (nondegree)
- (E) Psychology, B.A. or B.S.
- (B) Radio-television, B.A. or B.S.
- (E) Social work, B.A. or B.S.
- (E) Sociology, B.A. or B.S.
- (A) Speech, B.A. or B.S.
- (A) Speech pathology-audiology, B.A. or B.S.
- (A) Statistics, B.A. or B.S.
- (A) Theatre, B.A. or B.S.

College of Business Administration

Bachelor of science in business administration

- (E) Accounting
- (E) Finance
- (E) General business administration
- (E) Management
- (E) Marketing

College of Education

- (A) Elementary education (bachelor of science in elementary education)
- Secondary education (bachelor of science)
 - (A) Education—Art
 - (E) Education—Biological science
 - (B) Education—Business
 - (E) Education—Chemistry
 - (E) Education—Earth science
 - (B) Education—Economics
 - (A) Education—English
 - (A) Education—English and Journalism
 - (A) Education—Geography
 - (A) Education—History
 - (A) Education—Journalism
 - (F) Education—Mathematics
 - (A) Education—Modern languages
 - (E) Education—Physical science
 - (E) Education—Physics
 - (B) Education—Political science
 - (B) Education—Sociology
 - (A) Education—Speech

College of Engineering

- (F) Agricultural engineering (B.S. in agricultural engineering)
- (F) Architectural engineering (B.S. in architectural engineering)

- (F) Chemical engineering (B.S. in chemical engineering)
- (F) Civil engineering (B.S. in civil engineering)
- (F) Computer engineering (B.S. in computer engineering)
- (F) Construction science (B.S. in construction science)
- (F) Electrical engineering (B.S. in electrical engineering)
- (E) Engineering technology (B.S. in engineering technology)
- (F) Industrial engineering (B.S. in industrial engineering)
- (F) Mechanical engineering (B.S. in mechanical engineering)
- (F) Nuclear engineering (B.S. in nuclear engineering)

College of Human Ecology

B.S. in clothing and textiles

- (C) Apparel and textile marketing
- (C) Apparel design
- (C or F) Textile science

- B.S. in consumer and family economics
- (C) Consumer affairs
- (C) Housing and equipment

- B.S. in dietetics
- (C) Dietetics

- B.S. in foods and nutrition
- (C) Community health and nutrition
- (C or F) Food science
- (F) Nutritional sciences (pre-medical)
- (C or F) Nutrition and exercise sciences

- B.S. in food science and industry
- (F) Food science and industry

- B.S. in hotel and restaurant management
- (C) Hotel and restaurant management

B.S. in human development and family studies

- (C) Early childhood education
- (C) Family life and human development
 - Community services
 - Family studies (pre-law)
 - Life span human development
 - Human development and family studies and social world

- B.S. in human ecology
- (C) General human ecology

- B.S. in human ecology and mass communications
- (C) Human ecology and mass communications

- B.S. in interior design
- (C) Interior design

- B.S. in vocational home economics education
- (C) Home economics education

College of Veterinary Medicine

- Veterinary medicine (doctor of veterinary medicine)
- (See Colleges of Agriculture and Arts and Sciences for B.S. degrees in connection with College of Veterinary Medicine.)

Grades

The University uses the following grades:

A, for excellent work

B, for good work

C, for fair work

D, for poor work

F, for failure

I, for incomplete

IX, for unfinished incomplete, equivalent to F

P, for grades of B, C, or D in courses taken under the A/Pass/F grading option

Cr, for credit in courses for which no letter grade is given (nongraded courses)

NC, for no credit in courses for which no letter grade is given (nongraded courses)

NR, for no grade reported

NX, for no grade converted to the equivalent of F

W, for withdrawn

The grade of Incomplete normally is given in regular courses (other than independent studies, research, and problems) only for personal emergencies which are verifiable. The faculty member has the responsibility to provide written notification to the student of the incomplete work. The student has the responsibility to take the initiative in completing the work, and is expected to make up the incomplete during the first semester in residence at the University after receiving the grade, except for theses, dissertations, and directed research courses. If the student does not make up the incomplete during the first semester in residence at the University after receiving it, a grade may be given by the faculty member without further consultation with the student.

If after the end of the first semester the I remains on the record it will be designated as IX for record-keeping purposes and will be computed in the student's GPA, weighted at 0 points per credit. The designation of NR will be treated in a like manner.

Courses in which a Cr or P grade is received will be used in fulfilling graduation requirements. Only the grades A, B, C, D, and F (and the designations IX and NX under conditions described above) are used in calculating resident grade averages.

Report of grades

Academic progress reports for new freshmen are mailed to students and are sent to deans' offices at the close of the fifth week of classes.

The instructor reports final semester grades, based on examinations and class work, to the University registrar.

If a student drops a 16-week course after the 25th day of classes, a mark of W is reported. No 16-week course may be dropped after the tenth week of the semester. Regardless of the time of withdrawal, however, a final grade is reported and designated as such, if all the required work of the course has been completed.

In case of absence from the final examination, the instructor reports a mark of I for incomplete or computes the grade on the basis of zero for the final examination. If an Incomplete is reported, a reasonable time, usually not over one month, is allowed in which to take the exam.

For students who may be eligible to graduate in the spring semester, tentative grades will be collected at the end of regular class meetings. Instructors may revise tentative grades as a result of final exams.

Instructors leave all grade books in the proper departments when semester grades have been completed. The head of the department keeps all grade books on permanent file.

Points

For each semester hour of graded work, students earn points, as follows: A = 4, B = 3, C = 2, D = 1, F = 0.

Scholastic deficiencies

Students are notified of their scholastic status by the appropriate academic deans from information supplied by the University registrar. The scholastic record of each undergraduate is evaluated twice yearly, at the end of the fall semester and at the end of the spring semester. The student's scholastic status does not change as a result of work taken in summer session or intersession.

Undergraduate students (excluding students in the College of Veterinary Medicine) are placed on probation or dismissal according to the policy statement outlined later in this section.

Students will be placed on probation if 19 or fewer hours have been completed and the semester or cumulative grade point average drops more than three points below a C (2.0) average; if 20 through 39 hours have been completed and the semester or cumulative grade point average drops more than two points below a C (2.0) average; if 40 through 60 hours have been completed and the semester or cumulative grade point average drops more than one point below a C (2.0) average; or if more than 60 hours have been completed and the semester or cumulative grade point average drops below a C (2.0).

Students are automatically taken off probation when the overall grade point average reaches the required level.

Students may be dismissed if they have completed 12 or more semester hours of resident graded course work, have been on probation the previous semester, and have a GPA more than 12 points below a 2.0 for 12 to 60 hours, 11 points below a 2.0 for 61 to 80 hours, 10 points below a 2.0 for 81 to 100 hours, 9 points below a 2.0 for 101 to 120 hours, 8 points below a 2.0 for 121 to 140 hours, and 7 points below a 2.0 for 141 or more hours.

Students who neglect their academic responsibilities may be dismissed at any time on recommendation of the academic dean.

Reinstatement

A dismissed student will be readmitted only when approved for reinstatement by the academic standards committee of the college the student is attempting to enter. Normally a student must wait at least one semester before being considered for reinstatement.

The application for reinstatement must be directed to the academic standards committee of the specific college in which the student wishes to enroll.

Students who earn a semester grade point average of at least 2.0 but less than 2.2 on 12 or more credits during the semester they are dismissed can be considered for immediate reinstatement.

Students who earn a semester grade point average of 2.2 or more on 12 or more graded hours, or the minimum grade point average established by the student's college if higher, during the semester in question will not be dismissed.

Scholastic deficiencies chart

This chart may be used to determine deficiency for an overall average if the student has completed only KSU graded hours.

| Hours completed | Grade points | | Hours completed | Grade points | | Hours completed | Grade points | |
|-----------------|---------------------|---------------------|-----------------|---------------------|---------------------|-----------------|---------------------|----------------------------------|
| | Probation less than | Dismissal less than | | Probation less than | Dismissal less than | | Probation less than | Dismissal less than |
| 3 | 3 | — | 50 | 99 | 88 | 97 | 2.0 GPA | 184 |
| 4 | 5 | — | 51 | 101 | 90 | 98 | 2.0 GPA | 186 |
| 5 | 7 | — | 52 | 103 | 92 | 99 | 2.0 GPA | 188 |
| 6 | 9 | — | 53 | 105 | 94 | 100 | 2.0 GPA | 190 |
| 7 | 11 | — | 54 | 107 | 96 | 101 | 2.0 GPA | 193 |
| 8 | 13 | — | 55 | 109 | 98 | 102 | 2.0 GPA | 195 |
| 9 | 15 | — | 56 | 111 | 100 | 103 | 2.0 GPA | 197 |
| 10 | 17 | — | 57 | 113 | 102 | 104 | 2.0 GPA | 199 |
| 11 | 19 | — | 58 | 115 | 104 | 105 | 2.0 GPA | 201 |
| 12 | 21 | 12 | 59 | 117 | 106 | 106 | 2.0 GPA | 203 |
| 13 | 23 | 14 | 60 | 119 | 108 | 107 | 2.0 GPA | 205 |
| 14 | 25 | 16 | 61 | 2.0 GPA | 111 | 108 | 2.0 GPA | 207 |
| 15 | 27 | 18 | 62 | 2.0 GPA | 113 | 109 | 2.0 GPA | 209 |
| 16 | 29 | 20 | 63 | 2.0 GPA | 115 | 110 | 2.0 GPA | 211 |
| 17 | 31 | 22 | 64 | 2.0 GPA | 117 | 111 | 2.0 GPA | 213 |
| 18 | 33 | 24 | 65 | 2.0 GPA | 119 | 112 | 2.0 GPA | 215 |
| 19 | 35 | 26 | 66 | 2.0 GPA | 121 | 113 | 2.0 GPA | 217 |
| 20 | 38 | 28 | 67 | 2.0 GPA | 123 | 114 | 2.0 GPA | 219 |
| 21 | 40 | 30 | 68 | 2.0 GPA | 125 | 115 | 2.0 GPA | 221 |
| 22 | 42 | 32 | 69 | 2.0 GPA | 127 | 116 | 2.0 GPA | 223 |
| 23 | 44 | 34 | 70 | 2.0 GPA | 129 | 117 | 2.0 GPA | 225 |
| 24 | 46 | 36 | 71 | 2.0 GPA | 131 | 118 | 2.0 GPA | 227 |
| 25 | 48 | 38 | 72 | 2.0 GPA | 133 | 119 | 2.0 GPA | 229 |
| 26 | 50 | 40 | 73 | 2.0 GPA | 135 | 120 | 2.0 GPA | 231 |
| 27 | 52 | 42 | 74 | 2.0 GPA | 137 | 121 | 2.0 GPA | 234 |
| 28 | 54 | 44 | 75 | 2.0 GPA | 139 | 122 | 2.0 GPA | 236 |
| 29 | 56 | 46 | 76 | 2.0 GPA | 141 | 123 | 2.0 GPA | 238 |
| 30 | 58 | 48 | 77 | 2.0 GPA | 143 | 124 | 2.0 GPA | 240 |
| 31 | 60 | 50 | 78 | 2.0 GPA | 145 | 125 | 2.0 GPA | 242 |
| 32 | 62 | 52 | 79 | 2.0 GPA | 147 | 126 | 2.0 GPA | 244 |
| 33 | 64 | 54 | 80 | 2.0 GPA | 149 | 127 | 2.0 GPA | 246 |
| 34 | 66 | 56 | 81 | 2.0 GPA | 152 | 128 | 2.0 GPA | 248 |
| 35 | 68 | 58 | 82 | 2.0 GPA | 154 | 129 | 2.0 GPA | 250 |
| 36 | 70 | 60 | 83 | 2.0 GPA | 156 | 130 | 2.0 GPA | 252 |
| 37 | 72 | 62 | 84 | 2.0 GPA | 158 | 131 | 2.0 GPA | 254 |
| 38 | 74 | 64 | 85 | 2.0 GPA | 160 | 132 | 2.0 GPA | 256 |
| 39 | 76 | 66 | 86 | 2.0 GPA | 162 | 133 | 2.0 GPA | 258 |
| 40 | 79 | 68 | 87 | 2.0 GPA | 164 | 134 | 2.0 GPA | 260 |
| 41 | 81 | 70 | 88 | 2.0 GPA | 166 | 135 | 2.0 GPA | 262 |
| 42 | 83 | 72 | 89 | 2.0 GPA | 168 | 136 | 2.0 GPA | 264 |
| 43 | 85 | 74 | 90 | 2.0 GPA | 170 | 137 | 2.0 GPA | 266 |
| 44 | 87 | 76 | 91 | 2.0 GPA | 172 | 138 | 2.0 GPA | 268 |
| 45 | 89 | 78 | 92 | 2.0 GPA | 174 | 139 | 2.0 GPA | 270 |
| 46 | 91 | 80 | 93 | 2.0 GPA | 176 | 140 | 2.0 GPA | 272 |
| 47 | 93 | 82 | 94 | 2.0 GPA | 178 | 141 or more | 2.0 GPA | more than 7 points below 2.0 GPA |
| 48 | 95 | 84 | 95 | 2.0 GPA | 180 | | | |
| 49 | 97 | 86 | 96 | 2.0 GPA | 182 | | | |

Scholastic honors

Bachelor's degree candidates who have completed a minimum of 60 hours in residence, with at least 50 hours in graded courses, are considered for graduation with scholastic honors as follows: Students with a 3.950 or above KSU academic average are designated as "summa cum laude." The remaining students in the upper three

percent of the college graduating class are designated "magna cum laude." Those remaining in the upper 10 percent are graduated "cum laude." Doctor of veterinary medicine degree candidates are eligible to receive these honors based on courses completed in the professional program.

Students with 12 graded hours whose semester grade point average places them in the upper 10 percent academically of their classes and colleges will be awarded semester scholastic honors.

Graduate students are ineligible for these honors.

Credits for extracurricular work

Students may earn credit toward graduation by satisfactory participation in certain extracurricular activities. These activities, and the maximum semester hours of credit allowed, are as follows:

| Subject | Semester | Total |
|--|----------|-------|
| KSU Symphony Orchestra | 1 | 4 |
| Bands (Marching, Symphonic, Pep, etc.) | 1 | 4 |
| University Chorus | 1 | 4 |
| Concert Choir | 1 | 4 |
| Collegiate Chorale | 1 | 4 |
| K-State Singers | 1 | 4 |
| Concert Jazz Ensemble and Jazz Labs | 1 | 4 |
| Varsity Men's Glee Club | 1 | 4 |
| Women's Glee Club | 1 | 4 |
| Madrigal Singers | 1 | 4 |
| Instrumental Ensemble | 1 | 4 |
| Vocal Ensembles | 1 | 4 |
| Opera Workshop | 1 | 4 |
| Debate | 2 | 4 |
| Kansas State Collegian Journalism | 1 | 4 |
| K-State Agriculturist | 1 | 4 |
| K-State Engineer | 1 | 2 |
| Royal Purple Journalism | 1 | 4 |
| Men's Athletics | 1 | 4 |
| Women's Athletics | 1 | 4 |

Extracurricular credit is also available with the K-State Dance Workshop (through Dance Production class).

Credits may be counted as electives in a student's curriculum. A student may use no more than 8 semester hours in these subjects toward graduation and enroll for not more than two in a semester.

A student is regularly assigned to these activities, but only on the written recommendation of the instructor in charge of the work. A student participating in one or more of these activities must be enrolled even though the credits exceed the maximum for graduation.

Classification of students

An entering student with less than 30 semester hours accumulated credit is classified as a freshman. A student is advanced to a higher classification upon successful completion of sufficient credit hours to meet the requirements as listed below:

| Sophomore | Junior | Senior | Fifth-year student* |
|-----------|--------|--------|---------------------|
| 30 | 60 | 90 | 120 |

*Applies only to the College of Architecture and Design and the College of Engineering.

Student Records

University policy

Kansas State University maintains various student records to document academic progress and to record interactions with University staff and officials. To protect each student's rights to privacy, and to conform with federal law, the University has an established policy for handling student records. Interpretation of this policy is based on experience with educational records, and the policy itself may subsequently be modified in light of this experience. Notice of this policy and of a student's rights under federal law is given annually. Copies of this policy are available at the Registrar's Office, 118 Anderson Hall.

Directory information

Certain information concerning students is considered to be open to the public upon inquiry. This public information is called directory information and includes a student's name, local address and telephone number, permanent mailing address, college, curriculum, year in school, date and place of birth, dates of attendance at KSU, awards and academic honors, degrees and dates awarded, most recent educational institution attended, participation in officially recognized activities and sports, and height and weight of members of athletic teams.

Directory information as defined above will be released for individual students by the Registrar's Office for undergraduates and by the Graduate School office for graduate students to anyone upon inquiry, unless the student has requested within 10 days after registering that specific items not be released. The student's request to have directory information withheld must be submitted for each semester the student is enrolled and should be made at the University Registrar's Office, which will notify other appropriate University offices.

Confidential information

With the exception of the information noted above, student records are generally considered to be confidential. The following policies govern access to confidential student records:

1. Each type of student record is the responsibility of a designated University official, and only that person or the dean, director, or vice president to whom that person reports has authority to release the record. The responsible officials are:

a. Academic records: For undergraduates, the registrar, Anderson Hall; for graduate students, the Graduate School, Fairchild Hall.

b. Admissions records: For undergraduates, the director of admissions, Anderson Hall; for graduate students, the Graduate School, Fairchild Hall.

c. Financial aid records: director of Student Financial Assistance, Fairchild Hall.

d. Business records: Controller's Office, Anderson Hall.

e. Traffic and security records: head of KSU Police Department, East Stadium.

f. Medical records: director, Student Health Service, Lafene Health Center.

g. Counseling records: director, University Counseling Services, Lafene Health Center.

h. Actions of academic standards committees: college dean.

i. Academic disciplinary records: chair, Undergraduate Grievance Committee.

j. Nonacademic disciplinary records: dean of students, Holton Hall.

k. Housing records: director of housing, Pittman Building.

l. Placement records: director of Career Planning and Placement, Holtz Hall.

m. Evaluations for admission to graduate or professional programs: dean (of the Graduate School or the appropriate college) or department head.

n. Special academic programs: faculty member in charge of the program, and dean of the college.

o. Foreign student records: foreign student advisor, International Student Center.

p. Test scores for College Level Examination Program (CLEP), American College Testing Program (ACT), Miller Analogies Test (MAT), etc.: director, Academic Assistance Center, Holtz Hall.

2. Confidential educational records and personally identifiable information from those records will not be released without the written consent of the student involved, except to other University personnel, or in connection with the student's application for financial aid, or in response to a judicial order or subpoena, or in a bona fide health or safety emergency; or, upon request, to other schools in which the student seeks or intends to enroll; or to the U.S. comptroller general, the secretary of H.E.W., the U.S. commissioner of education, the director of the National Institute of Education, the assistant secretary for education, state educational authorities, or state and local officials where required by state statute adopted before November 19, 1974.

3. The responsible official may release records to University personnel who have a legitimate need for the information in order to carry out their responsibilities.

4. All student records are reviewed periodically. Information concerning the frequency of review and expurgation of specific records is available in the Registrar's Office.

5. With certain exceptions, students may review records which pertain directly to them upon request and may obtain a copy of the record at cost, according to the following schedule:

- a. Transcript of academic record—\$2 per copy.
- b. Housing department records—four cents per page.
- c. Medical charts—free for medical and/or employment purposes; otherwise \$10 to \$25.
- d. Other records—no charge.

The major exceptions to student review are medical and counseling records. These may be released, however, to other medical or psychological professionals at the written request of the student; and may be inspected by the patient at the discretion of the professional staff. Other exceptions are law enforcement records, private notes of staff members, and financial records of parents.

6. A student may waive the right to review a specific record by submitting in writing a statement to this effect to the official responsible for that record. Examples are recommendations for career placement or admission to graduate study.

7. University personnel who have access to student educational records in the course of carrying out their University responsibilities shall not be permitted to release the record to persons outside the University, unless authorized in writing by the student or as required by a court order. Only the official responsible for the records has the authority to release them.

8. All personal educational information about a student released to a third party will be transferred on condition that no one else shall have access to it except with the student's consent. A record is maintained showing who has had access to student records, and this record is open to inspection by the student.

Release of grades

Reports of a student's grades are routinely sent to the student. Parents of dependent students may obtain grades by writing to the University registrar. Proof of dependency is required. The grades of other students will be sent to their parents only with written permission of the student.

Withholding records

In the case of a student who is delinquent in an account to the University, including unpaid traffic or parking violations, or about whom official disciplinary action has been taken, the appropriate University official may request that the student's record not be released. The effect of this action is that transcripts are not released and registration forms are withheld. In order for the action to be rescinded, the Registrar's Office must receive written authorization from the official who originally requested the action, indicating that the student has met the obligation. Further information concerning this policy can be obtained from the Registrar's Office, 118 Anderson Hall, 532-6254.

Review and challenge of records

Upon request to the official listed above, a record covered by the act will be made available to the student within a reasonable time and in no event later than 45 days after the request. Copies are available at the student's expense and explanations and interpretations of the records may be requested from the official in charge. If the official believes that a particular record or file contains inaccurate or misleading information or is otherwise inappropriate, the University will afford an opportunity for a hearing to challenge the content of the record. Prior to any formal hearing, the official in charge of the record is authorized to attempt, through informal meetings and discussions with the student, to settle the dispute. If this is unsuccessful, the matter will be referred to the appropriate vice president.

If the student is still dissatisfied, a hearing may be requested. The hearing, conducted by a hearing officer appointed by the president, will be held within two weeks. The student will have the opportunity at the hearing to present any relevant evidence, and a decision will be rendered within two weeks after the hearing. If the result does not satisfy the student, he or she may place a statement in the file.

Complaints

A student who believes the University has not complied with federal law or regulations may send a written complaint to The Family Educational Rights and Privacy Act Office, 400 Maryland Avenue, S.W., Washington, D.C. 20202.

Transcripts

A transcript is a certified, official copy of a student's permanent academic record. Because the transcript contains confidential information, it cannot be furnished or released to anyone but the student without a specific request signed by the student. The official transcript verifies that the student has graduated or completed specific course work at Kansas State University.

Each transcript costs \$2; the required fee must be paid in advance. A transcript request must be made in person or in writing to the Registrar's Office, 118 Anderson Hall; it cannot be taken over the telephone.

A written request must include the following: name used when last enrolled at KSU, Social Security number, date of birth, date or semester last enrolled at KSU, number of transcripts requested, complete addresses listing where each transcript is to be sent, \$2 for each transcript, and the student's signature.

Transcripts picked up or sent directly to the student are stamped "issued to student." Some institutions will not accept a transcript that is marked "issued to student."

Transcript requests cannot be honored for a student with a delinquency to the University.

All-University Regulations

Student Conduct

Philosophy of student conduct

The purpose of discipline in the University setting is to protect the campus community and its members. To achieve this protection, students at KSU are expected to follow University rules and policies pertaining to nonacademic conduct. Persons who violate these policies, interfere with the rights of others, disrupt the educational process, or commit other unlawful acts will be held accountable for their actions.

The following principles govern the disciplinary process: every effort is made to bring about outcomes that are positive for all parties involved; students will be members of all Student Government Association judicial bodies; formal hearing processes are fundamentally fair and respect the rights of the individuals involved; confidentiality will be maintained; records of proceedings will be released only on written authorization of the student involved. The procedures are outlined in the SGA Judicial Code, included in the by-laws to the SGA Constitution.

Descriptions of the judicial structure and process, as well as University policies, are free and are available in the SGA Office of the K-State Union.

KSU student conduct code

Prohibited Conduct

The following misconduct is subject to disciplinary action:

1. Intentionally or recklessly causing physical harm to any person on University premises or at University-sponsored activities, or intentionally or recklessly causing reasonable apprehension or fear of such harm.
2. Unauthorized use, possession, or storage of any weapon on University premises or at University-sponsored activities.
3. Intentionally initiating or causing to be initiated any false report, warning, or threat of fire, explosion or other emergency on University premises or at University-sponsored activities.
4. Intentionally or recklessly interfering with University or University-sponsored activities, including, but not limited to, studying, teaching, research, University administration, or fire, police or emergency services.
5. Knowingly violating the terms of any disciplinary sanction imposed in accordance with this code.
6. Unauthorized distribution, use, or possession of a controlled substance as described in Chapter 65, Article 41 of Kansas Statutes Annotated, including but not limited to marijuana, cocaine, and heroin, on University premises or at University-sponsored activities.
7. Violation of the University's published alcohol and cereal malt beverage policy.
8. Intentionally or recklessly misusing or damaging fire safety equipment on University premises or at University-sponsored activities.
9. Forgery, unauthorized alteration, or unauthorized use of any University document or instrument of identification.
10. Intentionally and substantially interfering with the freedom of expression of others on University premises or at University-sponsored activities.
11. Theft of property or of services on University premises or at University-sponsored activities; knowing possession of stolen property on University premises or at University-sponsored activities.
12. Intentionally or recklessly destroying or damaging the property of others on University premises or at University-sponsored activities.
13. Unauthorized presence in or use of University premises, facilities, or property.
14. Negligently, recklessly, or intentionally participating in the hazing of another. (Consent by the person hazed shall be no defense to hazing.)
15. Intentionally or recklessly engaging in conduct which clearly and directly impairs, interferes with, or obstructs the missions, processes, and functions of the University.
16. Telephone harassment, which shall include making calls containing lewd or obscene remarks; making calls intended to harass whether or not conversation ensues; making the telephone ring repeatedly with intent to harass; and making repeated calls in which conversation ensues solely to harass.

Attempts to commit acts prohibited by this code shall be considered violations to the same extent as completed acts.

Sanctions may be imposed for prohibited conduct pursuant to the Student Governing Association Constitution and By-Laws.

Definitions

1. The term "group" means a number of persons who are associated with each other and who have not complied with University requirements for registration as an organization, but shall not include Greek

organizations which are part of the Interfraternity Council and the Panhellenic Council structure.

2. The term "organization" means a number of persons who have complied with University requirements for registration, but shall not include members of the Interfraternity Council and the Panhellenic Council.

3. The term "university" means Kansas State University.

4. The term "reckless" means conduct which one should reasonably be expected to know would create a substantial risk of harm to persons or property, or which would otherwise be likely to result in interference with normal University or University-sponsored activities.

5. The term "University premises" means buildings or grounds owned, leased, operated, controlled or supervised by the University.

6. The term "weapon" means any object or substance designed to inflict a wound, cause injury or incapacitate, including but not limited to, all firearms, pellet guns, switchblade knives, and knives with blades five or more inches in length.

7. The term "University-sponsored activity" means any activity on or off campus which is initiated, aided, authorized or supervised by the University.

8. The term "hazing" means coercing, demanding, or encouraging a member or prospective member of an organization or group to participate, as a condition of membership in any organization or group under the auspices of the University, in any activity which may be reasonably foreseen to cause discomfort, pain, fright, humiliation or injury; or violates any law regarding hazing.

University Policies

Students, faculty, and administrators are members of a community dedicated to the growth and development of individuals.

Enrollment at K-State entails responsibilities as well as privileges. Acceptance of and adherence to the following policies is necessary for the protection of the rights of others and the protection and health of the community. Copies of the following policies are available in the Student Government Services (SGS) Office in the K-State Union and the Dean of Student Life Office in Holton Hall, unless otherwise indicated.

Academic grievance

The following procedures will be employed to deal with all matters of cheating, academic dishonesty, grade appeals, or other academic grievances brought by students against faculty members or faculty members against students. This procedure will serve three functions: (1) safeguard the rights and academic freedom of both students and faculty, (2) assure due process, and (3) provide for consistency in handling undergraduate academic grievances throughout the University.

Procedural levels:

Level I. All efforts will be made by the student and instructor involved in any grievance to settle all disputes that may arise. Grade appeals must be initiated within six months following the issue date of the grade in question. If a student is charged with cheating or other academic dishonesty that may involve suspension or dismissal, the case will be reviewed by the head of the department in which the alleged violation occurred, and if not resolved to the satisfaction of all parties, or if suspension or dismissal is contemplated as penalty, by the student's dean; if still not resolved to the satisfaction of all parties, or if suspension or dismissal is contemplated, the case will be referred to the appropriate student grievance board for final disposition.

Level II. If a grade change grievance is not resolved by the student and instructor, either party may appeal in writing to the department head concerned who will act as a mediator in the dispute. At this time, the student may petition the dean of his or her college for an ombudsperson. The duties of the ombudsperson are to arrange meetings of all concerned parties and report actions taken at each level to the appropriate persons or groups. The ombudsperson will not be an advocate for any party but is to be an expeditor for the student.

Level III. If the grievance has not been settled to the satisfaction of both parties at Level II, written appeal may be made to the dean of the college most directly concerned. In undergraduate appeals the dean will act as a second mediator.

Level IV. If the student or instructor still does not feel that an adequate solution has been reached in any academic dispute, he or she may appeal in writing to the appropriate student grievance board which will arbitrate the dispute. If charges of cheating or other academic dishonesty have been made that could lead to suspension or dismissal of a student from the University, the board shall assume final jurisdiction over the case, as described under Level I above.

Further information for undergraduates is contained in the Faculty Senate Minutes, May 9, 1978, Academic Honesty and Undergraduate Grievance Statements. Graduate students should consult the Graduate Student Grievance Policy available in the Graduate School Office. Students in veterinary medicine should consult the dean of the College of Veterinary Medicine.

Advertising, sales, and solicitation

Facilities of Kansas State University are not available for unrestricted use by non-University groups. University property may not be used for commercial purposes except in conjunction with or when sponsored by a University-affiliated organization or department. The regulations governing fund-raising and the posting and distribution of literature are available in the SGS Office only.

AIDS, ARC, and AIDS virus guidelines

Under the direction of the Kansas Board of Regents, the University has developed guidelines to assist students, staff, and faculty members in the event that they have to deal with situations involving acquired immune deficiency syndrome (AIDS) or AIDS-related complex (ARC). Complete copies of the guidelines are also available in the Lafene Health Center.

Alcohol and cereal malt beverage policy

The legal drinking age in Kansas for alcoholic beverage is 21. The Kansas Board of Regents policy permits the use and sale of cereal malt beverages (3.2 beer) under authorized and appropriately controlled conditions and regulations. By state law, the sale of alcoholic liquor is not permitted on state property. Included in the K-State policy is information on alcohol and cereal malt beverage consumption in residence halls, at athletic events, and for student organizations.

Drug-free workplace policy

In 1988, Congress passed the Drug-Free Workplace Act. This act applies to all institutions holding and applying for federal grants and contracts. K-State adopted the policy that the unlawful manufacture, distribution, dispensing, possession, or use of controlled substances is prohibited in its workplace.

Facilities usage

K-State facilities are available for use by authorized groups for activities that complement the teaching, research, and service programs of the University. Policies and procedures for use of K-State facilities (other than the K-State Union) are also available in the Division of Facilities Management in Dykstra Hall.

Policies and procedures for use of the K-State Union are available in the Union Reservations Office on the second floor or in the Handbook for UAB Registered Organizations.

Gender

The goal of this policy is to create an environment in which all students, faculty, and staff interact solely on the basis of individual strengths and characteristics without having those interactions shaped by generalizations, stereotypes, or valuations based on gender. Copies are also available in the Women's Resource Center in Holton Hall.

Political activity guidelines

All members of the University community are encouraged to take advantage of opportunities to educate themselves regarding the candidates and issues relating to national, state, and local elections. Copies of the University guidelines related to political activities on campus are available in the SGS Office only.

Prayer at University functions

Nonsectarian prayers, invocations, benedictions, or silent meditations are permitted at University functions to enhance mutual respect and awareness.

Racial and/or ethnic harassment

Racial and/or ethnic harassment includes, but is not limited to, verbal, physical, or written behavior directed toward or relating to an individual or group on the basis of race, ethnicity, or racial affiliation. It has the purpose or effect of creating an intimidating, hostile, or offensive work or educational environment; interfering with an individual's work, academic performance, living environment, personal security, or participation in any University-sponsored activities; and threatening an individual's employment or academic opportunities.

Religious activities

In a pluralistic, multicultural, and interdenominational University environment, freedom of worship is supported. Religious programs and activities must comply with University policies as well as federal, state, and local laws. In keeping with its education mission, the University may specify the time, place, and manner of religious events, but may not regulate their content.

Sexual harassment policy

KSU prohibits sexual harassment and has defined sexual harassment as any behavior which, through inappropriate sexual content or disparagement of members of one sex, interferes with an individual's work or learning environment.

This policy applies to the working and learning relationships of all individuals within the University community—faculty, staff, and students. The complete policy and descriptions of the processes for resolution of complaints are available in the student government office, the departmental offices, and the Affirmative Action Office. Students who are sexually harassed by other students should report the incident to the Associate Dean of Student Life Office for appropriate action.

Any conduct adjudged sexual harassment by appropriate University bodies will be considered a serious breach of the Kansas State University policy and of the Civil Rights Act of 1964.

Sexual violence

No form of sexual violence will be tolerated or condoned at Kansas State University. This policy prohibits not only those acts commonly understood to constitute "sexual assault," but all attempts to coerce sexual activity as well. This University will investigate acts of sexual violence perpetrated by and/or against students and will respond with appropriate action, which may include suspension or dismissal. Copies are available also in the Women's Resource Center in Holton Hall.

Student Financial Assistance

Larry Viterna, Director
104 Fairchild Hall
532-6420

Kansas State University administers an extensive financial aid program to bridge the gap between family contribution and the cost of attending the University. Detailed information concerning financial aid is available on request from the Office of Student Financial Assistance, 104 Fairchild Hall, Manhattan, Kansas 66506-1104.

All aid programs require a student to submit a Family Financial Statement (FFS). Students living in Kansas may obtain the Family Financial Statement (FFS) from any high school counselor or from KSU. The priority date for submitting the FFS is March 15 before the fall semester in which the student intends to enroll.

Scholarship programs

Each year nearly 4,000 Kansas State University undergraduate students receive more than \$4 million of scholarship assistance based on their academic records, financial need, and/or leadership qualities. The KSU scholarship application is due by February 1 each year for the following academic year. Applications and scholarship information are available from high school counselors, the Office of Student Financial Assistance, and the various colleges at K-State.

Major scholarships

KSU students compete successfully for several well-known scholarship awards each year. In recent years these have included the various grants made for graduate study abroad under the Fulbright Hayes Programs, which send students to a country of their choice, usually for a nine-month period of research and/or formal study. The Rhodes Scholarship competition funds two or three years of graduate study at Oxford University in disciplines of the student's own selection. Sophomores interested in a career in government may apply for the Truman Award, which is made annually to at least one student in each of the 50 states and which supports the last two undergraduate years as well as two years of graduate study. Interested students may inquire at the dean's office, College of Arts and Sciences, 117 Eisenhower Hall.

Grants

Approximately 6,700 students are assisted through two federal grant programs.

Assistance exceeds \$7 million. The ACT Family Financial Statement is the application for these programs and should be filed by March 15.

Loan programs

KSU has six kinds of student loans: the Perkins Loan, the Stafford Loan (formerly GSL), the Parent Loan for Undergraduate Students (PLUS), the Health Professions Student Loan (HPSL), Alumni/Foundation Loans, and the Supplemental Loan for Students (SLS—like PLUS but for independent students).

The Perkins Loan is a five percent interest loan. The Stafford Loan is an eight percent interest loan (for new borrowers) that is funded by participating lending agencies. HPSL carries a five percent interest rate. No interest is charged while a student is attending school. At the time the borrower begins repaying these loans, the interest begins accruing on the unpaid balance. The repayment period may be up to 10 years.

The Alumni Loan/Foundation Loan charges six percent interest payable annually from the date of the loan, with \$50 monthly payments beginning six months after the borrower leaves school.

The PLUS/SLS loans are 12 percent for 1989-90. They begin accruing interest 60 days after the borrower receives the money. While independent students may defer payments (but not interest), parents borrowing on their student's behalf begin monthly payments either 30 or 60 days (depending on the lender) after receiving the money.

Qualified students also may borrow through emergency, alumni, and endowment funds to meet specific needs. Interested students should contact the Office of Student Financial Assistance.

Employment

Kansas State University provides services for students seeking part-time employment to help offset educational, living, and social expenses. The Student Employment Center, in 104 Fairchild Hall, handles two categories of jobs: College Work-Study Program jobs and Campus Payroll jobs. In addition, the center handles the advertising of several off-campus employment positions. All of the center's jobs are posted on the job board, which is in the K-State Union.

To be employed as a graduate assistant, graduate research assistant, or graduate teaching assistant, a graduate student must be enrolled in at least 6 resident semester credit hours at KSU during a fall or spring semester, and at least 3 resident semester credit hours at KSU during the regular

summer session, or have been enrolled in at least 6 resident semester credit hours at KSU during the preceding spring semester. To be employed on the hourly student payroll, a student must be enrolled in at least 6 resident semester credit hours at KSU during a fall or spring semester, and at least 3 resident semester credit hours at KSU during a summer session, or have been enrolled in at least 6 resident semester credit hours at KSU during the preceding spring semester.

Services for veterans

The University maintains a veterans' service to aid veterans and children of deceased or disabled veterans in securing educational benefits.

Veterans who have more than 181 days of service after January 31, 1955, may be eligible for educational benefits. Children of a deceased or disabled veteran may be entitled to educational benefits, providing the veteran's death or disability was due to active service in World War I, World War II, the Korean Campaign, or Vietnam.

Information may be obtained from your nearest Veterans' Administration Office or the Office of Student Financial Assistance at Kansas State University.

State vocational rehabilitation program

The University cooperates with the State Board for Vocational Education in providing rehabilitation training for physically handicapped persons who need financial assistance. Correspondence should be addressed to the Vocational Rehabilitation Administration, Kansas State Department of Education, 120 East 10th Street, Topeka, Kansas 66612.

Satisfactory Academic Progress

Federal regulations require that financial aid recipients make satisfactory academic progress in order to be eligible for federal financial aid programs. Included are students who receive aid from any of these programs: Pell Grant, Supplemental Educational Opportunity Grant (SEOG), State of Kansas Scholarship, Perkins Loan (formerly NDSL, National Direct Student Loan), Guaranteed Student Loan (GSL), Supplemental Loan for Students (SLS, formerly ALAS and PLUS loan), Health Professional Loan (HPL), and College Work-Study (CWS).

K-State has established a framework for evaluating a student's efforts to achieve an educational goal (degree) within a given period of time. This includes a quantitative measure (number of hours earned each semester) and a qualitative measure (grade points earned for hours completed each semester).

All recipients of student financial assistance will be required to meet the standards of satisfactory academic progress. The only programs not covered by this policy are athletic grants-in-aid and non-federally funded scholarships.

Definition of satisfactory progress

Federal guidelines for awarding financial aid are based on specific minimum federal standards. Satisfactory academic progress is determined by the formula:

$$\frac{\text{Hours for which federal financial aid is awarded}}{\text{Hours completed}} = \text{Credit or deficiency}$$

Students begin satisfactory academic progress measurement during the first term federal aid is received. Credits or deficiencies are carried forward. Credits or deficiencies apply only to satisfactory academic progress measurement.

Minimum hours required for these programs are:

| | Hours per semester | Hours per summer* |
|--|--------------------|----------------------------------|
| Undergraduates | | |
| Pell full-time grant | 12 | 6 |
| 3/4-time grant | 9 | 5 |
| 1/2-time grant | 6 | 3 |
| State of Kansas scholarship (A portion of each scholarship contains federal funds) | 12 | Only for full-time, regular term |
| SEOG, Perkins, Stafford, SLS, PLUS, and HPSL | 6 | 3 |
| Graduates | | |
| Perkins, Stafford, SLS, and HPSL | 5 | 3 |

If a Pell Grant is part of the aid package, minimum hours for all aid awarded is based upon the Pell minimum requirements.

*Or term less than 15 weeks.

A course cannot be counted twice for financial aid purposes. Example: A student has received a "D" in a 3-credit-hour course and takes that course again to get a higher grade. The credit hours have already been counted as financial aid hours and cannot be counted again, even though the GPA is improved.

Courses in which a grade of F or incomplete (I), (IX), withdrawn (WD), NR, or NC is recorded are not counted in the satisfactory progress measurement. Graduate students will receive credit for incompletes in research that follows the published degree requirements as elective or required courses, or courses taken as a part of developmental studies. Students will be measured by the financial aid award that requires completing the most hours. For example, a student with a full-time Pell and a GSL must complete 12 hours.

Hours completed in excess of the required minimum standards will be credited to a student's overall academic achievement.

Course hours earned by a student while at another institution will be credited only after a transcript from the other institution is received by the Registrar's Office at Kansas State University and the credit is accepted. The course or courses will count for the academic year in which K-State accepted the credit. Cumulative grade point average is determined by the Registrar's Office.

The scholastic deficiencies chart is printed in the Grades section of this catalog. Federal regulations require students to earn a 2.0 cumulative grade point by the end of their sophomore year (60 hours) to receive federal financial assistance.

Transfer students

A transfer student shall receive financial aid for the first semester at K-State and then follow the same standards for satisfactory progress as all other students.

Financial aid warning

Students who are deficient in hours during a semester or summer term will be placed on financial aid warning for one term. At the end of the next term, a student's performance will again be measured. A student will be reinstated to satisfactory status for financial aid awarding purposes if the deficiencies have been removed. A student will be placed on financial aid exclusion if the deficiency has not been eliminated.

Financial aid exclusion

Students on financial aid exclusion will be denied financial assistance until they meet the qualifications for satisfactory progress. Students may file an appeal for satisfactory academic progress to the Office of Student Financial Assistance. If an appeal is approved, financial aid (if available) may be reinstated for the term in question.

Appeal process

Appeal forms for satisfactory academic progress are available at the Office of Student Financial Assistance. Appeals are made in writing to the satisfactory academic progress administrative officer in the Office of Student Financial Assistance indicating the circumstances of the appeal. The student's academic advisor must state that a conference has been held with the student to discuss the academic deficiencies and to decide what action is being taken to improve the student's academic record.

All appeals are reviewed and students who submit appeals will be informed of the action taken. The appeal may be either approved or denied. If approved, financial aid may be reinstated subject to its availability. The student may be required to participate in special activities to improve his or her academic program. Decisions regarding appeals are final and not subject to further review.

Services for Students

Academic Assistance Center

Mike Lynch, Director
Holton Hall
532-6492

The Academic Assistance Center (AAC) provides a comprehensive and coordinated system for the identification, diagnosis, advisement, counseling, and referral of students to the various academic support services available at KSU. In addition, the AAC provides direct academic support through programs which include:

Learning Skills Seminar

The Learning Skills Seminar is designed for new incoming students and provides study skills instruction and assistance in the specific social science and mathematics courses in which the student is enrolled.

Tutorial assistance

Free tutoring is available to any KSU student through the EOF tutoring program. Students desiring assistance are assigned to small groups which meet on a weekly basis with a peer tutor who assists them with course content and learning strategies.

Study Skills Lab

The AAC provides instruction in basic academic and study skills through the course Study Skills Laboratory (EDCI 051). Any student may enroll in the Study Skills Lab for 1 to 3 hours of graded credit. Topics covered include note-taking, textbook mastery, how to prepare for and take examinations, time management, stress management, etc.

Freshman Seminar

The AAC offers a Freshman Orientation Seminar (EDAF 111) to new incoming students for 1 hour of credit. Freshman Seminar provides any student new to Kansas State with a general orientation to K-State and University life. Topics covered include study skills, effective use of campus resources and services, academic planning and advising, career decision making, and University policies and procedures.

Math lab

The AAC provides a computer-assisted math lab for students desiring either a basic review of pre-algebra mathematics before actually enrolling in a formal mathematics course or assistance with Intermediate and College Algebra. Students enrolling in the Learning Skills Seminar program receive math lab assistance as a part of the seminar. Students who are unsure of which math course to enroll in may take a

45-minute math placement exam. This assessment is available on a walk-in basis in the AAC.

Credit by examination

Kansas State University offers students a variety of quiz-out programs through which a student may earn academic credit in specific courses. The AAC is the campus service agency for the College-Level Examination Program (CLEP), the DANTES Program, and the American College Testing Proficiency Examination Program (ACT-PEP). The Center will also provide consultation and conduct utility studies for academic departments interested in implementing a credit-by-examination program. Information and registration for the CLEP, DANTES, and ACT-PEP programs are available from the AAC.

Entrance and professional examinations

The AAC administers the following examinations, which are often required to enter selected undergraduate, graduate, or professional programs. Contact the AAC to obtain further information concerning these and other examinations.

American College Test (ACT) Residual
Dental Admissions Testing Program
Graduate Management Admissions Test
Graduate Record Examination
Insurance Institute Exams
Law School Admission Test
Miller Analogies Test
National Teacher Examination (Core Battery)
National Teacher Examination (Specialty Areas)
Optometry Admission Testing Program
Pre-Professional Skills Test
Scholastic Aptitude Test (SAT)
Test of English as a Foreign Language (TOEFL)
Test of Spoken English
Veterinary Aptitude Test

Alcohol and Other Drug Education Service

Bill Arck, Director
214 Lafene Health Center
532-6927

The Alcohol and Other Drug Education Service (AODES) offers information about physical effects and social issues related to alcohol and other drug use or abuse. Campus services provided include media

activities such as newspaper ads, posters, brochures, and radio public service announcements; coordination of and participation in awareness events, such as National Collegiate Alcohol Awareness Week and National Collegiate Drug Awareness Week; support for the DIAL telephone taped information service; and presentations providing information on alcohol and drug-related topics. AODES can also make referrals to various resource for those with concerns about their own or another's possible alcohol and/or drug use or abuse.

Career Planning and Placement Center

Bruce Laughlin, Director
Holtz Hall
532-6506

Kansas State University is recognized for the outstanding career development services it provides, and Career Planning and Placement Center staff members are regarded as regional and national leaders in the field. Strong academic programs, capable students, and a campus work ethic combine to give KSU students a distinct advantage over those from many institutions in planning and achieving vocational/professional and graduate study goals.

Accessibly located, the Career Planning and Placement Center occupies all of Holtz Hall and offers assistance to prospective freshmen, undergraduates, graduating seniors, graduate students, and alumni in career planning and employment. The office provides a centralized placement system for all colleges and departments of the University, bringing together students, faculty members, and employer representatives seeking college-educated personnel. Services include employment vacancy referrals, data sheet and resume preparation assistance, interview workshops, career advisement, self-instructive videotaping, and education/government/industry employer interface workshops.

Career planning is facilitated through the use of SIGI PLUS—a computerized system of interactive career guidance and information that helps students in values clarification, the gathering of occupational information, and the development of strategies for getting from the current situation to appropriate occupational and professional goals.

The center attracts hundreds of business and industry, government, and education

recruiters to the campus each year for thousands of employment interviews. Students in curricula not regularly sought for on-campus interviews have access to equally valuable career guidance to develop job search strategies. Guidance is also provided for obtaining summer employment.

In addition to providing career exploration materials, the career library reflects current employment trends and opportunities in business, industry, agriculture, education, and government. A comprehensive collection of materials is maintained to assist students in assessing occupations, professions, and continuing education.

Cooperative Houses

Clovia

Clovia 4-H Cooperative House accommodates up to 62 women. Although 4-H members are given preference, any undergraduate woman is welcome to apply for membership. To keep the house self-supportive, the women at Clovia contribute four to six hours a week for duties. Providing economical living conditions for members is a main goal at Clovia. House bills are approximately \$160 per month, and vary according to social activities and other house functions. Applications can be obtained at County Extension Offices, the State 4-H Department at Kansas State University, or the Clovia Membership Chairman, 1200 Pioneer Lane, Manhattan, Kansas 66502, (913) 539-3575.

The Smith Scholars Program

The Smith Scholars Program provides a broad learning experience for 38 young men each year. Smith Scholars are selected on the basis of academic promise and potential to contribute to a structured program of organized living. The Smith Scholars live in Smith Scholarship House, a cooperative living arrangement wherein the men do the cooking and housekeeping, providing a substantial savings in housing costs over most other types of living groups.

The men develop and participate in programs of personal and academic growth in seven areas: academics, culture, University and community, social, physical and mental health, leadership and governance, and vocational planning.

The Smith Scholars Program is a joint project of the Maitland E. Smith Scholarship House Alumni Association and the KSU Foundation. For more information write to the Smith Scholars Program, 331 North 17th Street, Manhattan, Kansas 66502; or phone (913) 539-4685.

Dean of Student Life Office

Pat J. Bosco, Associate Vice President for Institutional Advancement and Dean of Student Life
122 Anderson Hall
532-6237

Susan M. Scott, Associate Dean
102 Holton Hall
532-6432

Student life services, including Admissions, Financial Assistance, Greek Affairs, Housing, K-State Union, Pre-Admissions, Recreational Services, Registrar, and the Associate Dean of Student Life, are coordinated and directed by the associate vice president and dean. These units meet the needs of prospective and enrolled students.

This office is responsible for the Student Governing Association, student activities, leadership development, the administration of the judicial program for nonacademic misconduct, and off-campus housing. Student activities, FENIX, Multicultural Student Organizations, Religious Affairs, and the International Student Center are supervised and supported by this office. Staff members coordinate assistance to students and families in times of personal crisis and are available to students for general advice, counsel, and assistance with personal problems.

Educational Supportive Services

Anne Butler, Director
Holton Hall
532-5642

Low-income, physically limited, and minority students are assisted in setting and attaining realistic educational goals and are provided information about graduate-level educational opportunities. Students admitted and enrolled at KSU are offered educational supportive services including counseling (personal, career, academic, and financial), academic preadvising, individualized tutorial assistance, and a variety of referral services.

FENIX

Suzanne Knorr, Director
201 Holton Hall
532-6434

The FENIX Adult Student Program serves undergraduate and graduate students who are married, have children, are re-entering the educational system after several years, or are 25 years of age or older. Whether these students are beginning, transferring, or returning to college, FENIX staff members assist them as they go through K-State's admission and enrollment processes. They provide students with information or referrals for housing, child care, refresher and study skills courses, tutoring, financial aid, insurance, public school enrollment, community family programs, and commuter information. And they work for them with University and student groups, such as the adult student group OWLS, to make their experiences as adult students at K-State successful ones. FENIX advisors help them with their everyday challenges and special concerns before, during, and after their admission to Kansas State University.

Adults considering beginning college for the first time, re-entering college, or transferring to K-State, as well as those who are currently enrolled, are invited to visit the FENIX office in 201 Holton Hall.

Greek Affairs

Barb Robel, Advisor
Holton Hall
532-5546

Sororities

Booklets describing sororities and setting forth the provisions regulating selection of new members are provided to all prospective freshmen and interested upperclasswomen by Panhellenic Council. These may be obtained by writing to the advisor for Greek Affairs.

House bills in sororities will average approximately \$1,200 a semester. This includes room, board, and sorority dues. Freshman members, however, live in residence halls and pay sorority dues of approximately \$45 a month.

The following national sororities have established chapters at KSU: Alpha Chi Omega, Alpha Delta Pi, Alpha Kappa Alpha, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Sigma Theta, Gamma Phi Beta, Kappa Alpha Theta, Kappa Delta, Kappa Kappa Gamma, Pi Beta Phi, Sigma Sigma Sigma, and Zeta Phi Beta.

Fraternities

Fraternities select new members primarily during the summer months. High school seniors are often guests at fraternity houses during their senior year, and throughout the spring and summer months each fraternity has representatives visiting high school seniors and their parents in Kansas and surrounding states.

Freshman men may live in a fraternity house if they accept invitations to membership before classes start and if they cancel their residence hall contracts. Costs will average \$1,200 a semester. For more information, write to the advisor for Greek Affairs.

The following national fraternities are established at K-State: Acacia, Alpha Gamma Rho, Alpha Kappa Lambda, Alpha Phi Alpha, Alpha Tau Omega, Beta Sigma Psi, Beta Theta Pi, Delta Sigma Phi, Delta Tau Delta, Delta Upsilon, Farm-House, Kappa Alpha Psi, Kappa Sigma, Lambda Chi Alpha, Omega Psi Phi, Phi Beta Sigma, Phi Delta Theta, Phi Gamma Delta, Phi Kappa Tau, Phi Kappa Theta, Pi Kappa Alpha, Pi Kappa Phi, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Tau Kappa Epsilon, Theta Xi, and Triangle.

Housing

Charles Werring, Director
Pittman Building
532-6453

We encourage all students new to K-State to live in an organized living group, such as a residence hall, fraternity, or sorority. The advantage of living in some form of organized housing is that adjustment to the university setting will be quicker and smoother. Students who choose a living group are offered both more interaction with other students and University staff and more opportunities to participate in organized social events.

Kansas State University provides residence hall living for more than 4,000 students, and 576 apartments for student families.

Residence halls

Each residence hall has a director who is a full-time professional and a student staff of resident assistants. The total residence hall program is coordinated by the director of housing.

A number of life-style options exist, including academic cluster areas (students of the same major living together), intensive study floors, and graduate student/upper-class areas. Additional information on these opportunities is available on request.

The following services and facilities are furnished in residence halls: sheets and pillowcases—laundered weekly; free washers and dryers, areas for hand laundry; and pleasant rooms with beds, mattresses, chests of drawers, closets, and study tables. The student furnishes pillow, towels, blankets, bedspreads, and other personal items.

All of the residence halls have quiet study rooms, and several halls have computer terminals. Each hall also has lounges and recreation areas for relaxation and social activities, with televisions, stereo equipment, Ping-Pong tables, and the like.

Accessible rooms are available for students with physical limitations. The Department of Housing is pleased to work with students to accommodate special needs.

Three meals are served every day but Sunday, when no evening meal is served. Most meals are served cafeteria style, but special dinners and buffets add to the variety of the food service program.

Contracts are issued on receipt of a residence hall room application and \$25 nonrefundable application fee for fall enrollees and \$12.50 for those entering in the spring.

When the application and fee are received by the Department of Housing, an academic-year housing contract is forwarded to the student. The cost of the contract is set on an annual basis, and is one of the lowest room and board rates in the Big 8.

Students may elect either the full payment plan or installment plan.

Applications and detailed information are available from the Department of Housing, Pittman Building, Manhattan, Kansas 66506-4601.

Smurthwaite House Women's Leadership Program

The Smurthwaite House Women's Leadership Program is a special leadership and personal development experience for Kansas State University women students who would like to become active in leadership positions in student government, academic organizations, and co-curricular organizations.

Assignment to Smurthwaite House and the Women's Leadership Program is made through a special application process. Because space is limited and assignment is not guaranteed, it is best to also go through the regular residence hall application and contract process.

Self-government in residence halls

Learning to manage your own affairs is certainly a part of university life. This takes maturity and self-discipline. All residence halls have a system of self-governance

through which students work together in determining policies regarding their living situations. Elected representatives serve on individual hall governing boards and assume responsibility for many social and educational activities.

Graduate student housing on campus

Single graduate students are welcome to live in the residence halls. Edwards Hall is reserved for graduate and upperclass students.

Single graduate students also qualify for the Evans Apartments. There are 20 one- and two-bedroom apartments in this building. Furniture, water, and heat are provided. Applications and specific rental/cost information are available from the Department of Housing.

Family housing

Student families at Kansas State University have access to one- and two-bedroom apartments at Jardine Terrace, both furnished and unfurnished. These low-cost apartments are close to the campus. Coin-operated laundry facilities are available.

The rental includes gas, water, and trash. Assignments are made on a first-come, first-served basis, and early application is recommended. Families residing in Jardine Terrace Apartments use the mayor-council form of government to regulate community life.

Apartments are partially accessible for people with physical limitations. The Department of Housing is pleased to work with students and family members to accommodate special needs.

Arrangements can be made to see an apartment Monday through Friday, 8 a.m. to 4:30 p.m. at the Housing Office, or call 532-6453. Applications and specific rental/cost information are available at the Department of Housing, Pittman Building.

See also the Off-Campus Housing and Cooperative Housing sections.

International Student Center

Donna Davis, Director
532-6448

The International Student Center provides a comfortable, relaxed atmosphere where people wanting to increase their international perspective can always find new friends. Made possible by a private gift to the University, the center includes a multipurpose meeting room, dining room, kitchen, and reading lounge. Students from everywhere pass through the center each day, sharing cultures, traditions, recipes, language lessons, and their common

concern for all that is happening in today's world. Everyone is welcome to join in the programs and activities of the International Student Center and the various international student organizations.

Foreign Student Office

Adjacent to the International Student Center is the Foreign Student Office. This office provides administrative services required for KSU international students and scholars by their home countries and the United States Immigration and Naturalization Service. The office also acts as the University's primary resource for international student programs. People interested in getting involved with the programs of this office or the activities of the International Student Center are invited to call 532-6448 for more information.

K-State Union

Jack Sills, Director
532-6591

The K-State Union, rated by the *New York Times* as one of the top five college unions in the United States, is the campus center for social, recreational, educational, and cultural activities. It opened in March 1956 and is supported only by generated revenue and student fees.

The K-State Union and its two additions were built entirely by student fees. It features a full-service bookstore with an extensive selection of new and used textbooks, tradebooks, magazines, memorabilia, convenience items, and personal computers; a food service operation complete with cafeteria, banquet facilities, and on-campus catering; a recreation area complete with bowling, billiards, video games, snack bar, and pro shop; an art gallery, information counter, check cashing service, automatic bank teller machines, lounges, copy center, two auditoriums, campus vending service, and much more.

Union Program Council (UPC), the student volunteer arm of the K-State Union, is located in offices on the third floor. UPC provides more than 450 programs each year for the social, cultural, educational, and personal growth of students. Student Governing Association offices are located on the ground floor.

The Catskeller will re-open its doors as a non-alcoholic bar in the fall of 1990.

The Union Governing Board is the body that established policy under which the K-State Union director and staff operate.

Lafene Health Center

Lannie W. Zweimiller, Director
532-6544

The Lafene Health Center is a modern ambulatory healthcare facility designed to provide for most student outpatient health needs. The health center is fully accredited by the Joint Commission on Accreditation of Healthcare Organizations. Students who have paid the health fee as a part of their tuition are eligible for care. Non-student spouses, university conference participants, and campus visitors may receive care upon payment of a special fee.

Lafene Health Center is centrally located on campus and provides, through a full compliment of medical and other professional personnel, a wide range of services that include special clinics for sports-related injuries, women, and allergies and immunizations, as well as a clinic for general care. Also included are services in health education, nutrition, and physical therapy. The services of a pharmacy, laboratory, and x-ray are also available at reduced rates.

The center is staffed by full-time physicians with medical support personnel. When necessary, the student is referred to specialists for treatment at the student's expense.

After regular clinic hours a student who is ill or injured may receive medical care through the after-hours clinic of the Lafene Health Center. Home calls are not made. The local ambulance service is available, when needed, to transport patients to the appropriate health care facility.

It is strongly recommended that all students at Kansas State University carry medical insurance, either through the parents' plan at home or through the student health insurance program available at special rates. This plan covers most services provided at Lafene Health Center and payable claims for medical expenses if the student requires care away from the campus. Health insurance is mandatory for all international students and their families.

Kansas State University requires a complete medical history, including a current immunization record, on all new students or transfer students. This history must be completed on the Kansas State University medical history form. A physical examination is not required, but encouraged, and a copy of this examination assists the staff in evaluating illnesses. If a student has a continuing medical problem, a summary from the attending physician is helpful should treatment at the center be needed. Students receiving allergy injections must furnish instructions from their allergists

before injections can be administered at the health center.

Students are welcome to visit the health center any time for a personal view of the facilities and are urged to bring their medical questions or concerns to the professional staff. Services and charges are subject to change without notice.

Multicultural Student Organizations

Diana Caldwell, Coordinator
201 Holton Hall
532-6436

Emphasis is placed on building strong cultural groups which foster the development of leadership skills and roles for multicultural students on campus; supporting multicultural student organizations, including the Black Student Union (BSU), the Hispanic American Leadership Organization (HALO), and the Native American Student Body (NASB); assisting student organizations in sponsoring programs and activities which bring multicultural leaders and role models to KSU; and heightening multicultural awareness within the community.

Off-Campus Housing

Susan M. Scott, Associate Dean of Student Life
102 Holton Hall
532-6432

The Office of the Associate Dean of Student Life assists students in locating off-campus housing. An up-to-date listing of major apartment complexes, real estate agents, and managers of apartments, as well as mobile home lots and rentals, is available. Currently available units are posted on a bulletin board with information on cost, size, restrictions, etc. This office also assists students who are looking for roommates.

Pre-Admissions

Pat J. Bosco, Associate Vice President/
Dean of Student Life
122 Anderson Hall
532-6237

The pre-admission unit works primarily with prospective students and their families.

Admissions representatives communicate to prospective students through high school visits, college planning conferences, and on- and off-campus special event programming about the academic program and student life opportunities available at the University.

The Campus Visitation Program offers campus tours to prospective students and their parents. The student visitation guides also conduct a variety of special campus tours for visiting groups and community and civic organizations.

New Student Programs include orientation/enrollment, the KSU scholars program, and the presidential lectures series (K-State faculty presenting lectures to high school audiences without charge). This area also edits several publications for new students including the parent calendar and *Your First Year*.

Recreational Services

Raydon H. Robel, Director
532-6980

Recreational Services is the department responsible for the intramural, recreational sports, and fitness programs for the campus. With the current interest in and emphasis on recreation and fitness, thousands of participants are involved in the programs each year.

Intramural sports are the scheduled competitive activities of the recreation program. Teams are organized by fraternities, sororities, residence hall floors, and off-campus, co-rec, and faculty/staff groups. Thousands participate in various activities and engage in both team and individual sports. More than 30 different intramural activities are offered for competition.

KSU has superior facilities to accommodate participants. The natatorium at the Ahearn Sports Complex has two 25-yard swimming pools, one diving pool with two one-meter and two three-meter boards, and a sun deck.

The Chester E. Peters Recreation Complex opened in 1980. It houses 16 handball/racquetball courts; two gyms (convertible to six basketball, nine volleyball, six tennis, and 18 badminton courts); two weight and exercise areas; combatives area; a running track; men's and women's locker rooms with showers and saunas; a central supervisory and check-out area; and administrative offices.

Outdoor facilities include lighted tennis and handball/racquetball courts, multipurpose playfields, a fitness cluster, and running trails. Outdoor recreational equipments, including canoes, tents, sleeping bags, and other camping equipment can be rented at the Outdoor Rental Center.

For students interested in unique learning experiences, the department provides employment as lifeguards, sports officials, building managers, and office assistants.

Religious Affairs

Don Fallon, Coordinator
102 Holton Hall
532-6432

Religious life finds expression in 25 student religious organizations and in approximately 40 congregations in Manhattan. The coordinator of religious activities in Holton Hall provides information regarding religious activities and organizations on campus and in the community. Pastoral care and counseling are available through this office and by referral to campus ministers and local clergy. Students may seek counseling regarding relationships, sexuality, death and loss, or other personal and spiritual concerns. There are two memorial chapels on campus, Danforth and All Faiths, which are available for student worship, weddings, and private meditation.

Services for Physically Limited Students

Gretchen Holdon, Director
Holton Hall
532-6441

Services for Physically Limited Students attempts to meet the needs of students with physical limitations and learning disabilities by providing academic, financial, and vocational counseling. Other supportive services include tutorial assistance, readers, notetakers, interpreters, taped text service, typing, and errand service. Special test-taking accommodations can be arranged

through this office. Classes scheduled in inaccessible locations will be moved for students with mobility impairments, and individualized help with enrollment is provided.

A shuttle service operates on campus between all buildings and is available to students with either temporary or permanent physical limitations. Special equipment available to students includes a talking computer and calculator, Kurzweil Reading Machine, variable-speed tape recorders, and a TTY (telephone for the hearing impaired). Accessible housing is available.

Reading and study skills instruction may be of special interest to learning disabled students. Staff will work as a liaison with student's instructors.

Student Activities

Sally Routson, Coordinator
K-State Union, SGS Office
532-6541

The coordinator of student activities is available to assist students in identifying extracurricular and cocurricular activities and avenues of campus involvement to complement their formal education. The coordinator also advises the Student Governing Association and student judicial system, administers the student activity fee, and assists individuals and groups who wish to organize and register their activities on the K-State campus. Leadership workshops are organized annually, and consultation is available for leadership development to interested campus leaders and organizations.

Student Government

Sally Routson, Coordinator of Student Activities
K-State Union, SGS Office
532-6541

The purpose of the Student Governing Association (SGA) is to help students voice any concerns, suggestions, or grievances they may have. Every student is automatically a member of the Student Governing Association and is represented by a college council (elected by the students in each respective college), by one student senator for each 300 students enrolled in the colleges, and by the student body president. The student senators and the student body president are elected by the KSU student body.

SGA is divided into three branches: legislative, judicial, and executive. The legislative branch—student senate—is composed of six standing committees: academic affairs and university relations, communications, finance, senate operations, student affairs and social services, and legislative affairs. A major function of student senate is the allocation of the student activity fee and the Educational Opportunity Fund, which are collected as part of the tuition payment. These funds are used to assist student and University organizations in providing programming and services for the KSU community.

The judicial branch is composed of judicial council, Student Review Board, tribunal, parking citation appeals board, and the living group judicial boards.

The student body president and cabinet make up the executive branch. The president has the responsibility to promote the general welfare of the students and acts as the official voice of the student body to the faculty, administration, and public.

Another form of representation is the Associated Students of Kansas (ASK). ASK is a student lobby group which takes the concerns of students in each of the state schools to the Kansas legislature.

Student organizations

More than 325 organizations are available to students, faculty members, staff, and community members.

The Activities Carnival early in the fall semester offers an opportunity for new and old members of the University community to acquaint themselves with campus clubs and organizations.

Any organization desiring to become a registered organization must adhere to the University Activities Board (UAB) constitution and current guidelines, which include a statement of purpose or constitution, the names of the organization's officers, a full-time faculty advisor, registration of any fundraising projects, open membership, and an agreement to abide by the rules and regulations of the University.

Registered groups may schedule rooms and tables in the K-State Union, use most campus facilities, and post notices on campus bulletin boards.

Applications and information about any of the registered organizations may be obtained by contacting the coordinator of student activities.

U-LearN

16 Holton Hall
532-6442

University Learning Enhancement Resource Network (U-LearN) is a walk-in and phone-in resource center for questions regarding academic, campus, or community activities and information in general. U-LearN also operates the campus and community information section of the DIAL taped information system. This facility maintains a library of cassette recordings on topics of interest to University staff and students. Brochures listing tapes can be obtained at the U-LearN office. To hear the tape of your choice call 532-6907.

U-LearN offers specialty services through areas of programming which include the Work Opportunity Resource for K-State Students (WORK). WORK consists of a job board with listings of positions available on campus and in the Manhattan community. U-LearN also has a person available to assist with financial aid assistance and procedures. A third area of programming assists students with off-campus housing. A trained staff person is available to discuss landlord-tenant relations, renting issues and concerns, and general information.

University Counseling Services

Fred Newton, Director
Second Floor, Lafene Health Center
532-6927

The Counseling Service is open 8 a.m. to 5 p.m. weekdays. Emergencies are handled through the Lafene Health Center After-Hours Service (532-6544). Professional counselors, psychologists, social workers, and a psychiatrist are available to assist KSU students.

Individual, couple, and/or group counseling is offered for people wishing to discuss academic, career, or personal concerns. A policy of confidentiality is followed. No information is released without written authorization of the student. Psychological testing may be used as an adjunct to career or personal counseling.

In addition, programs using a workshop or seminar format are offered to enhance personal growth and skill development. These include stress management, biofeedback, career life planning, assertiveness training, couples communication, alcohol prevention, study skills assistance, managing change, and creativity development. Academic credit courses are offered in Career Life Planning (EDAF 511)

and Guidance for the Paraprofessional (EDAF 311).

Consultation by center staff members is offered to individual students, staff, or faculty members concerning their work and living environments. Additionally, the staff is available for class or group presentations and workshops upon request.

Appointments may be made by contacting the receptionist. Urgent matters may be handled by the counselor on call during normal office hours.

Upward Bound Program

Reginland McGowan, Director
202a Holton Hall
532-6497

This federally funded program provides academic and personal counseling and guidance to disadvantaged high school students from Junction City, Manhattan, St. George, and Westmoreland high schools. Designed to motivate students with academic potential to pursue a postsecondary education, Upward Bound provides its 9th, 10th, 11th, and 12th grade participants with academic, social, cultural, and career-oriented activities and experiences during the school year, and with a residential credit-bearing educational program during the summers on the KSU campus.

Women's Resource Center

Judith Davis, Director
206 Holton Hall
532-6444

The Women's Resource Center serves to promote the academic and personal well-being of K-State students. Center services include support, advocacy, and referral services to individual students experiencing difficulties; study and support groups; educational programs on a variety of gender-related topics to classes and to student, faculty, and community groups; and a browsing/lending library.

Auxiliary Services and Facilities

Affirmative Action Office

Jane Rowlett, Director
214 Anderson Hall
532-6220

The Affirmative Action Office is available to students on matters of equal opportunity in all areas including admissions, access to programs and activities, and employment. The University is committed to a policy of equal educational opportunity regardless of race, sex, religion, national origin, age, or handicap. Any barriers that students encounter for these reasons should be discussed with this office so that we may aid in their removal.

Alumni Association

Fred Thibodeau, Executive Director
111 Hollis House
532-6260

The Kansas State University Alumni Association, formed on June 24, 1874, is a 30,000-member organization dedicated to promoting K-State. It is not a department of the University devoted to the alumni; rather, it is an independent group of alumni and friends devoted to the University.

The nonprofit organization supports K-State through student recruitment programs, maintenance of records on more than 110,000 alumni and friends, publication of the *K-Stater*, and sponsorship of local alumni gatherings and class reunions.

Child Care

KSU Child Development Center

The KSU Child Development Center is a nonprofit corporation formed in June 1985 by parent students and employees of Kansas State University to serve the child care needs of KSU students, faculty, and staff. It is fully licensed by the state of Kansas and is professionally staffed. Its facilities are in building "L" of Jardine Terrace.

The KSU Child Development Center offers full-day programs for infants (ages two weeks to one year and walking), toddlers (ages 12 months and walking through 2½), preschoolers (ages 2½ through 5), and school-age children (ages 5-12). Limited part-time program spaces are offered to

families of toddler through school-age children who need regular flexible care.

The goal of the center is the nurturing of the whole child. Continuity with family life is fostered through parent participation, family events, and times for conferring and sharing between parents and caregivers. Quality of care is assured in each program by a consistent caregiver or teacher, a well-planned program, and explicit expectations for the operation of the program.

For further information about the center and an application for enrollment, call the office at 539-1806.

Department of Human Development and Family Studies

This department operates two child care facilities. Both are licensed by the Kansas State Department of Health and Environment and accredited by the National Academy of Early Childhood Programs. Enrollment in these programs is open to members of the K-State and Manhattan communities.

The Hoeflin Stone House Child Care Center is on the northeast edge of campus. The center provides full day care for 30 children ranging in age from 18 months to 5 years. Priority is given to children of working parents. The program focuses on the children's developmental needs and interests.

The Early Childhood Laboratory is on the east edge of campus. The facility integrates children who have speech and language disabilities with nonhandicapped children, and accommodates an age range from 2½ to 5 years in a part-day program.

The activities and environment at both facilities are designed to foster children's cognitive, language, social, emotional, and physical growth and development.

Further information and applications for enrollment can be obtained by calling the Department of Human Development and Family Studies at 532-5510.

Family Center

Stephan R. Bollman, Director
Campus Creek Road
532-6984

The Family Center provides applied educational experiences to students while offering family-related educational outreach, counseling, and consultation services to the Manhattan community and the state. Sponsored by the College of Human Ecology, the Family Center provides an interdisciplinary focus with

faculty participation from departments within the college.

Students, under faculty supervision, offer services involving marriage and family therapy, family life education, nutritional counseling and consultation, and financial counseling. Affiliated programs include the Friendship Tutoring Program for school-age children and programs sponsored by grants. Special workshops address particular family topics, including working parents, parent education, and family life. The annual seminar—Working With Families—features the Ruth Hoeflin Forum on Family Issues.

Services are available to students and the general public. A fee is assessed for some services based on a sliding scale.

The Family Center is open 8 a.m. to 5 p.m. Monday through Friday. For further information call 532-6984 or 776-6566.

Foundation

Arthur F. Loub, President
103 Hollis House
532-6266, 532-7150

The Kansas State University Foundation has been designated as the official fundraising arm of the University and is a nonprofit organization certified under Section 501 (C) (3) of the IRS Code of 1954. The Foundation acts as the custodian for gifts to the University and is encouraged to receive and hold in trust any real and personal property given for the use of Kansas State University, and to administer and control all the gifts to provide those services which are not or cannot be provided through appropriated funds.

Although the Foundation is not a bank it offers many of the same services and is responsible for the administration of 1,950 scholarships and the processing of 32,000 gifts annually, while administering total assets of \$82,000,000. Policy is formulated by a 175-member board of trustees and an executive committee of 15 members to which the staff, directed by the president, is responsible.

Institutional Advancement

Robert S. Krause, Vice President
 Pat J. Bosco, Associate Vice President and
 Dean of Student Life
 John T. Fairman, Assistant Vice President
 for University Relations
 Michael L. Lynch, Assistant Vice President
 for Personal Development Programs
 Veryl Switzer, Associate Athletic Director
 and Assistant Vice President for
 Minority Affairs
 122 Anderson Hall
 532-5942

The vice president for institutional advancement is responsible for the external relations of the University and is the chief student affairs officer. Additionally, the vice president coordinates on going activities with the KSU Foundation, KSU Alumni Association, and KSU Athletic Department, and external relations with such groups as governmental agencies, the Board of Regents, and other constituents of the University. The vice president for institutional advancement reports directly to the president and serves as chief spokesperson for the University.

Police Department

Southeast corner, Memorial Stadium
 532-6412 (24 hours)

The University Police Department is responsible for the protection of all properties owned or operated by the state educational institution or its affiliates. This authority is granted under state law. While service to the KSU community is of great concern to the department, the prevention of crime and investigation of all reported crimes is also of prime importance.

Parking and traffic control are a part of the overall responsibility of the KSU Police Department. All motor driven vehicles, except mopeds, parked on University property must be identified with a University parking permit or a guest permit. Permits may be purchased at the KSU Police Department. Driving and parking of motor vehicles are governed by regulations established by a student-employee Traffic and Parking Council, by authority of K.S.A.—74:3211.

A parking information booklet is available.

Postal Service

113 Dykstra Hall
 532-6306

All mail for students must be addressed to their Manhattan residences, not the University.

Manhattan Post Office personnel deliver U.S. mail directly to University buildings and residence halls and pick up outgoing U.S. mail from various locations on the campus.

The KSU Central Mail Service in the west end of Dykstra Hall sells stamps, money orders, and other postal supplies; weighs, insures, and registers mail; and receives outgoing U.S. mail. A self-service postal unit is in the K-State Union.

Speech and Hearing Center

Caroline Salva, Director
 107 Leasure Hall
 532-6879, 532-6873

The Speech and Hearing Center provides evaluation, management, and consultation services. Services are extended to University students with articulation, fluency, voice, language, or hearing impairments. These clinical services are also available to children and adults of the surrounding communities. A purpose of the center is to provide educational and clinical experiences for students who are preparing for careers in speech-language pathology and audiology. Students may call for information or may be referred by instructors.

Student Publications

Ron Johnson, Director
 103 Kedzie Hall
 532-6555

Student Publications Inc. is a nonprofit student publishing corporation that publishes the daily student newspaper, *The Kansas State Collegian*; the student yearbook, the *Royal Purple*; and the *Campus Directory*. Student Publications is governed by the Board of Student Publications, composed of four students elected by the student body annually and three faculty members appointed by the University president.

The Board of Student Publications names an editor in chief of the *Collegian* three times each year: fall, spring, and summer terms. The board names a student advertising manager three times annually. The *Royal Purple* editor is chosen in the spring for the following year-long term. The editors and advertising managers hire students for a variety of staff positions, and these persons are directly responsible to the editor or ad manager.

The Collegian and *Royal Purple* are student forums that represent the students' views. They each have faculty advisors, but the content is determined and controlled solely by the editors and student staffs. Both publications have been recognized nationally as the top student publications in the United States in recent years.

University Press of Kansas

Fred M. Woodward, Director
 329 Carruth
 Lawrence, Kansas 66045
 KANS-A-N 864-4154

Kansas State University, in association with the other five Regents' universities, operates and supports the University Press of Kansas for the purpose of publishing scholarly and regional books on a nonprofit basis. KSU joined the consortium in 1967 when the press was officially reorganized by the Kansas Board of Regents. Until mid-1982, the operation was known as the Regents Press of Kansas.

The University Press of Kansas is the first American university press to operate as a statewide consortium under the specific sponsorship of all the state's universities. A member of the Association of American University Presses since its founding in 1946, the press has published over 450 titles, with some 270 currently in print. Its ongoing American Presidency Series, with 22 titles issued to date, has been praised as "one of the most interesting and rewarding historical series in this country."

The press is governed by a board of trustees, who are the chief academic officers of the sponsoring institutions and who appoint two members and two alternates from each faculty to serve on the advisory Editorial Committee.

University Relations

John Fairman, Assistant Vice President for University Relations
122 Anderson Hall
532-6269

Public information for KSU activities and events is coordinated through University Relations and its four units: News Services, Photographic Services, Printing Services, and University Publications.

News Services (9 Anderson Hall, 532-6415) is the official outlet for print and broadcast news materials relating to KSU policies and administration. News services are available to all KSU departments and activities. News Services also publishes the University's official faculty-staff newsletter, *In-View*.

Photographic Services (101 Power Plant, 523-6304) provides support for University-related activities. Services include photo-processing, photography on location and in studio, research photography, publicity portraits, and slide reproduction.

Printing Services (8 Kedzie Hall, 532-6308) produces a full range of products supporting the educational and administrative missions of the University. Books, brochures, business cards, envelopes, letterheads, posters, and other printed matter, as well as second and third class mailing services, are available to all KSU departments and affiliated organizations.

University Publications (5 Anderson Hall, 532-6419) provides full-service editing, design, and production coordination in the development of printed materials for KSU departments and activities. The operation's primary responsibilities focus on enrollment management, recruitment, and informational publications.

International Programs

Vernon C. Larson, Assistant Provost for International Programs
108 Waters Hall
532-5714

Although the first foreign student enrolled at K-State in 1898, it was not until 1955 that a major international thrust began, when KSU deans of agriculture and veterinary medicine were invited to India to investigate ways to make that country self-sufficient in food production. They observed that what the land-grant institutions had accomplished in the United States might be valuable for India. Thus began a new "international" dimension to the University.

K-State is involved in international programs for four major reasons:

Self-improvement

An international program enhances the land-grant mission of teaching, research, and extension. KSU faculty with international experience can enrich their teaching, research, and extension programs, and a mix of international students on campus is valuable for K-State students.

Research

The economy of Kansas benefits from collaborative research with developing countries. Overseas research has provided new knowledge and technology for U.S. agriculture, business, engineering, and other areas.

Economic

Having faculty abroad in developmental roles assists the U.S. economy. The demand for food in developed countries, our traditional trading partners, is stagnant. Future markets are in the developing countries. Experience in Asia and Latin America over the last two decades shows that American farm exports have benefitted from increased agricultural productivity in third world countries.

Humanitarian

There is much hunger in the world and Americans want to help. When a disaster occurs in some remote area of the world, Americans are often the first to respond.

In 1986 the position of assistant provost for International Programs was created to give coordination and direction to this area. The function of the office is to provide leadership and administrative support throughout the institution to bring about mobilization and wise use of its resources to contribute to programs abroad, and by the same process bring about an effective on-campus international component.

International offices

Assistant Provost for International Programs
Vernon C. Larson

International Agriculture
Vernon C. Larson and Jim Jorns

International Grains Program
Charles Deyoe

International Meat and Livestock Program
Jack Riley

International Trade Institute
Ray Coleman

Food and Feed Grain Institute
Charles Deyoe

Foreign Student Advisor and International Student Center
Donna Davis

South Asia Center
Aruna Michie

Paraguayan Development Program
Meredith Smith

Study Abroad Office
Walter Kolonosky

Area study programs

International Studies
Charles Bussing

Latin American Studies
Bradley Shaw

South Asian Studies
Aruna Michie

Russian and Soviet Studies
Walter Kolonosky

International Trade Studies
Ali Fatemi

Study abroad programs

Agricultural Study Tour
David Mugler

Art History Abroad
Lou Ann Faris Culley

European History
Robert Linder

French Program in Paris
Betty McGraw

Kansas Summer Institute in Germany
Carol Millen

Mexico Summer Program
Margaret Beeson

Russian Study Tour
Walter Kolonosky

Summer Abroad in English Education
Ray Kurtz

Exchange programs

Austria

Leopold Franzens University
Robert Kruh

People's Republic of China

Luoyang Institute of Technology, Luoyang,
Henan Province
Vernon Larson

Henan Agricultural University
Vernon Larson

Costa Rica

University of Costa Rica, San Jose
Vernon Larson

Denmark

Aarhus School of Architecture, Aarhus
Robert Burnham

Danish International Student Exchange
Program
Richard Forsyth

France

Aix-Marseille University, Marseille
Keith Purcell

Ecole Superieure d'Agriculture de Purpan
Donald Erickson

Honduras

Escuela Agricola Panamericana,
Tegucigalpa
David Mugler

Ministerio de Recursos Naturales of
Honduras, Tegucigalpa
Vernon Larson

Mexico

Instituto Technologico Y De Estudios De
Monterrey
Jim Jorns

New Zealand

University of Otago, Dunedin
Barbara Stowe

Paraguay

School of Agriculture, National University,
Asuncion
Jim Jorns

Catholic University, Asuncion
Jim Jorns

Switzerland

Eidgenossische Technische Hochschule,
Zurich
Robert Kruh

West Germany

Ludwig Maximilian Universitat, Munich
Robert Kruh

Justus Liebig Universitat, Giessen
Robert Kruh

Technical University, Trier
James Dubois

Regional

Higher Council of Central American
Universities
Vernon Larson

Other international activities and programs

English Language Program
Enid Cocks

International Sorghum and Millet Program
(INTSORMIL)
Richard Vanderlip

Memorandum of Understanding with AID
Jim Jorns

Midamerica International Agricultural
Consortium (MIAC)
Vernon Larson and Walter Woods

Association of Big Eight (ABEU Interna-
tional Council)
Vernon Larson

4-H International Programs
Errol Burns

Secondary Majors

Kansas State University offers secondary majors in American ethnic studies, gerontology, industrial and labor relations, international studies, Latin American studies, South Asian studies, and women's studies. Open to students in all colleges, these secondary majors are designed to be taken concurrently with the student's primary major. Most programs of study will allow students to take both a primary and a secondary major within the normal four-year program, especially because courses applied toward the secondary major may also satisfy requirements for general education or restricted electives.

As interdisciplinary programs, secondary majors provide students with an opportunity to understand the viewpoints and methodologies of a multiplicity of disciplines as they are focused on a central subject. Secondary majors thus allow the student to participate in the process of the integration of knowledge. For some students, these interdisciplinary programs are career-oriented, the special concentration providing extra qualifications for employment.

Program requirements follow a common pattern. Each includes two or more of the following features: an interdisciplinary introductory course (which might also satisfy distribution requirements); a list of electives from which students choose about 18 hours; and an interdisciplinary senior seminar featuring supervised independent study.

Each program has a supervisory committee and a director to whom students may refer for advising.

American Ethnic Studies

Harriet Ottenheimer, Director

Professors Boyer,* Fedder,* Finnegan,* O'Brien,* H. Ottenheimer,* Rappoport,* and Suleiman;* Associate Professors Armagost,* D. Benson,* McElroy,* A. Pigno; Assistant Professors A. Cochran and Wigfall; Emeritus R. Taylor.

American ethnic studies, as intercollegiate and interdisciplinary programs, have resulted from a reawakened interest in understanding and accepting the ethnic identity and heritage of the peoples of this nation.

While the discipline of anthropology has traditionally offered courses about Native American Indians, African Americans, and Hispanic Americans, other disciplines have neglected these groups until recently. In the

late 1960s such disciplines as history, sociology, political science, psychology, English, and modern languages brought their particular disciplinary tools to bear on the experiences of these previously neglected peoples. Professional programs in journalism, education, and business also developed courses focused on these ethnic groups.

At Kansas State University, the American ethnic studies program primarily focuses on African Americans, Hispanic Americans, and Native American Indians, but includes the study of other ethnic groups in the United States as well. The courses in the program meet the educational and career needs of students by preparing them to function intellectually in a multiethnic, multiracial, multicultural world.

Students are encouraged to enroll in American ethnic studies courses whether or not they select the option of a secondary major in American ethnic studies.

The secondary major

The director of the program will advise secondary majors.

Students completing 24 semester hours of course work in a minimum of two departments of the University may earn a secondary major in American ethnic studies.

Course requirements

DXX 160 Introduction to American Ethnic Studies

(3 hours, DAS/DHE/DED-160-0-0313)

DXX 499 Senior Research Project (3)

ANTH 200 Introduction to Cultural Anthropology (3 hours; section especially compatible with the American ethnic studies program)

Area courses (15 hours)

- Afro-American, Hispanic American, and Native American Indian ethnic groups of the United States (6 hours)
- Ancestral cultures of Afro-American, Hispanic American, and Native American Indian ethnic groups of the United States (3 hours)
- Any United States ethnic group or the ancestral culture of a United States ethnic group (6 hours)

The distribution of area courses must include at least two American ethnic groups. No course can be used to fulfill more than one course requirement.

The following are courses for which American ethnic studies credit can be earned. Each semester a list of approved courses will be published in the schedule of classes.

Area courses

- Afro-American, Hispanic American, and Native American Indian

General

- | | |
|-----------|--|
| ANTH 515 | Creativity and Culture |
| JMC 530 | The Ethnic Media in America |
| POLSC 602 | Class, Power, and Public Policy |
| POLSC 616 | Discrimination and the Law |
| SOCIO 570 | Race and Ethnic Relations in the U.S.A. |
| EDCI 455 | Teaching in a Multi-Cultural Society (1 cr.) |

- | | |
|----------|---|
| EDCI 730 | Education of the Disadvantaged |
| EDCI 733 | Curriculum Materials for Ethnic Diversity |

- | | |
|-----------|-------------------------|
| HDFS 750 | Low Income Families |
| PSYCH 535 | Social Psychology |
| THTRE 672 | American Ethnic Theatre |

African American

- | | |
|-----------|--|
| ANTH 517 | African American Music and Culture |
| ANTH 536 | African American Cultures |
| ENGL 651 | Twentieth-Century Afro-American Literature |
| HDFS 652 | Black Families |
| HIST 535 | History of the South |
| HIST 539 | Black American History |
| MUSIC 420 | History of Jazz |
| MUSIC 424 | Jazz in Kansas City and the Southwest |
| MUSIC 425 | Topics in Jazz |
| PE 703 | Minority Groups in Sports |
| PE 745 or | |
| SOCIO 745 | Sociology of Sport |
| POLSC 616 | Discrimination and the Law |

Hispanic American

- | | |
|----------|--|
| ENGL 652 | American Indian and Chicano Literature |
| HIST 561 | Colonial Hispanic America |

Native American

- | | |
|----------|---|
| ANTH 533 | Indians of Kansas |
| ANTH 630 | Indians of North America |
| ART 662 | Southwestern Indian Arts and Culture |
| ENGL 652 | American Indian and Chicano Literature |
| HIST 537 | History of the Indians of North America |

- Ancestral cultures of African American, Hispanic American, and Native American Indian ethnic groups of the United States

African

- | | |
|-----------|------------------------------------|
| ANTH 550 | Cultures of Africa |
| ANTH 536 | African American Cultures |
| POLSC 526 | African Politics |
| ANTH 517 | African American Music and Culture |

Latin American

- | | |
|-----------|---|
| ANTH 532 | Mexican and Central American Indians |
| ANTH 634. | Indian Cultures of South America |
| ANTH 673 | Pre-Columbian Civilizations of Mexico and Guatemala |
| GEOG 620 | Geography of Latin America |
| HIST 560 | Latin American Nations |
| HIST 561 | Colonial Hispanic America |
| HIST 562 | Modern Mexico |
| SPAN 563 | Introduction to the Literature of Spanish America |
| SPAN 566 | Hispanic American Civilization |
| SPAN 752 | Contemporary Spanish American Narrative |
| SPAN 772 | Hispanic World Today |
| POLSC 522 | Latin American Politics |

Native American

- | | |
|----------|-----------------------------|
| ANTH 570 | American Indian Archaeology |
|----------|-----------------------------|

- Any United States ethnic groups and the ancestral cultures of those groups (all the courses listed under categories A and B and the following)

General

- | | |
|--------------|---|
| ANTH 220 | Introduction to Linguistic Anthropology |
| ANTH 515 | Creativity and Culture |
| ANTH 519 | Practical Anthropology |
| ANTH 676 | Archaeology of the Old World |
| ANTH 685 | Race and Culture |
| BIOL 320 | Economic Botany |
| ENGL 515 | Commonwealth Literature |
| GEOG 100 | World Regional Geography |
| GEOG 640 | Geography of Europe |
| HIST 582 | Modern Eastern Europe |
| POLSC 629 | Administration in Developing Nations |
| SOCIO 510 or | |
| SOCWK 510 | Social Welfare as a Social Institution |
| SOCIO 740 | Comparative Social Systems |

Asian

ANTH 505, ECON 505, GEOG 505, HIST 505,
POLSC 505, SOCIO 505

Introduction to the Civilizations of
South Asia I

ANTH 506, ECON 506, GEOG 506, HIST 506,
POLSC 506, SOCIO 506

Introduction to the Civilizations of
South Asia II

ANTH 545 Cultures of India and Pakistan
ART 420 History of South Asian Art
HIST 350 Gandhi and the Indian Revolution
HIST 504 History of Hinduism
POLSC 511 Contemporary Chinese Politics
POLSC 623 South Asian Politics
POLSC 625 Southeast Asian Politics
POLSC 652 International Politics of South Asia
SOCIO 742 Society and Change in South Asia

French

FREN 510 Modern French Culture
FREN 514 French Civilization

German

GRMN 530 German Civilization

Jewish

HIST 596 Holocaust: The Destruction of the
European Jews

Middle Eastern

POLSC 624 Middle Eastern Politics
POLSC 653 International Politics of the Middle East

Russian

GEOG 650 Geography of the Soviet Union
HIST 250, Russian Culture and Civilization
RUSSN 250
HIST 564 The Russian Revolution and the Soviet
System
HIST 591 History of Russia to 1801
POLSC 627 Soviet-Style Regimes

Credit and content

All courses regularly offered for American ethnic studies credit have at least 40 percent or a major focus of content concerned with American ethnic groups, their ancestral cultures, or American ethnicity. Instructors and students of courses not regularly included in the American ethnic studies program may petition for credit on the basis of the same criteria.

Examples of specific courses for which the granting of American ethnic studies credit may vary are the following:

ANTH 420 Ethnography of Language
SOCIO 541 Wealth, Power, and Privilege
SOCIO 741 Social Differentiation and Stratification

In addition, departments offer courses on special topics, seminars, pro seminars, honors seminars, and independent studies that may apply for credit.

Relevant KSU-validated courses of transfer students will be accepted for American ethnic studies credit upon validation by the American Ethnic Studies Governance Board.

Gerontology

The rapid growth of an older population in the United States is creating an increasing demand for personnel who possess specialized training in gerontology in a variety of occupations and professions.

Undergraduate secondary major

The secondary major in gerontology is a 24-hour program of study. It includes two required courses, Introduction to Gerontology and Senior Seminar in Gerontology, and 18 semester hours from the approved list of gerontology electives offered in participating departments in five colleges. Elective courses must be taken in a minimum of three separate departments. Along with the secondary major, students can take an emphasis in long-term care administration. This emphasis requires completing the secondary major in gerontology, Financial Accounting (ACCTG 211), Management Concepts (MANGT 420), an approved 480 clock-hour internship (6 credit hours, DAS or DHE 515), Long-Term Care Administration (SOCWK 610C), and at least one course in each of 10 training code areas as defined by the Kansas Board of Adult Care Administration. With planning, the emphasis can be completed within 27 credit hours and a 6-credit-hour internship. Courses listed below will carry credit in the gerontology studies program and new courses will be added to the program as the curriculum is updated.

Students taking the secondary major in gerontology should consult the Center for Aging staff, 1 Fairchild Hall, 532-5945.

Interdisciplinary courses

315. Introduction to Gerontology. (3) I. Multidisciplinary introduction to the field of aging. Examines social, psychological, developmental, organizational, and economic aspects of aging. Theoretical, methodological, and applied issues of aging related to contemporary American society. Pr.: None. 315-0-4900 (codes 7, 9)

415. Senior Seminar in Gerontology. (3) II. Integration of course work in gerontology with in-depth project in special interest area. Pr.: Completion of 15 hours of course work in gerontology secondary major. 415-0-4900 (code 10)

515. Long-Term Care Administration Internship. (6) II. Includes: (a) field experience in the general administration of long-term care programs and/or facilities: planning, budgeting, program management, and service delivery; (b) exposure to federal and state standards and regulations governing long-term care; and (c) professional leadership development. Concurrent enrollment in a 3-credit hour class in long-term care administration is also required. Pr.: Junior standing, 15 hours of gerontology, Financial Accounting (ACCT 211), Management Concepts (MANGT 420), completed or conc. enrollment in Long-Term Care Administration (SOCWK 610C), and GPA of 2.5 or above (3.0 or above in long-term care administration curriculum). DHE-515-0-1301

Departmental course electives

See the appropriate college sections of this catalog for further description.

College of Agriculture**Horticulture**

HORT 525 Horticulture for Special Populations
(code 7)

College of Architecture and Design**Architecture**

ARCH 730 Environment and Aging
(codes 1, 7, 9)

Regional and community planning

PLAN 315 Introduction to Planning
(Gerontology)
(codes 1, 2, 7, 9)
PLAN 761 Community Development
Workshop (var.)

College of Arts and Sciences

DAS 315 Introduction to Gerontology
(codes 7, 9)

DAS 415 Senior Seminar in Gerontology
(code 10)

DAS 515 Long-term Care Administration
Internship

Biology

BIOL 240 Structure and Function of the
Human Body (code 5)

(Only three of the six credits for this course count toward the secondary major in gerontology.)

BIOL 310 Biology and the Future of Man
BIOL 397A Topics in Biology: The Biology of
Aging (code 5)

English

ENGL 535 Literature of Aging

History

HIST 520 Death and Dying in History

Physical education and leisure studies

PE 335 Physiology of Exercise (codes 5, 7)
PE 796 Physical Activity and the Older
Adult: Psychological Perspectives

Recreation for Special Populations
(code 6)

LS 493 Therapeutic Recreation Services*
LS 501 Therapeutic Processes in
Rehabilitation Agencies*

LS 862 Leisure Counseling

Psychology

PSYCH 520 Life Span Personality Development
PSYCH 715 The Psychology of Aging
(codes 4, 6)

Social work

SOCWK 566 Social Work in Aging Services
(codes 5, 7)

SOCWK 610C Topics in Long Term Care
Administration (code 6)

Sociology

SOCIO 744 Social Gerontology: An Introduction
to the Sociology of Aging
(codes 6, 7)

SOCIO 944 Seminar in the Sociology of Aging

Speech

SPPAT 605 Communication Disorders and
Aging

THTRE 665 Theatre for Special Populations

College of Education**Administration and Foundations**

EDAF 862 Leisure Counseling

Adult and occupational education

EDAO 780 Educational Gerontology

College of Human Ecology

DHE 515 Long-term Care Administration Internship

Clothing, textiles, and interior design

ID 751 Designing for Exceptional Needs (codes I, 2, 7)

Human development and family studies

HDFS 510 Human Development and Aging (codes 4, 5, 6, 7)

HDFS 654 Death and the Family (codes 5, 7)

HDFS 704 Seminar in Human Development and Family Studies (var.)

HDFS 770 Economics of Aging

HDFS 845 Adult Development and Aging

Foods and nutrition

FN 132 Basic Nutrition (code 5)

FN 718 Physical Health and Aging (codes I, 2, 5)

FN 817 Nutrition and Aging

*Project approval from the Center for Aging needed.

For more information about the secondary major in gerontology, contact the Center for Aging, 1 Fairchild Hall, Manhattan, Kansas 66506-1102, (913) 532-5945.

See the Graduate School section for information on the graduate emphasis in gerontology.

Industrial and Labor Relations

The secondary major in industrial and labor relations provides students a valuable opportunity to obtain the academic background and skills pertinent to the negotiation and administration of labor contracts as well as those relating to dispute settlement in industrial, governmental, and institutional settings. There is an increasing demand for people with these skills in all sectors of the economy.

Undergraduate secondary major

The secondary major in industrial and labor relations is a 28-hour interdisciplinary program of study, offered jointly by the Department of Management in the College of Business Administration and the Departments of Economics, Psychology, and Sociology, Anthropology, and Social Work in the College of Arts and Sciences. Twenty-two of the hours must be taken outside the student's primary major area. MANGT 330 and five additional courses are required as shown in group I below. In addition, two elective courses must be chosen from each of groups II and III below.

Students interested in the secondary major in industrial and labor relations should contact the Department of Management in the College of Business Administration, 19 Calvin Hall, 532-6296, for additional information and counseling.

Required courses (16 hours)

ECON 620 Labor Economics
MANGT 330 Introductory Seminar
MANGT 530 Industrial and Labor Relations
MANGT 630 Labor Relations Law
PSYCH 560 Industrial Psychology
SOCIO 647 Sociology of Work

Restricted electives (6 hours)

Two courses from:

ECON 540 Managerial Economics
HIST 554 American Labor History
MANGT 637 Industrial Conflict Resolution
SOCIO 546 Bureaucracy in Modern Societies
PSYCH 550 Group Dynamics

Group electives

Two courses are to be selected from the following groups (only one course may be chosen from any group):

Group A
MANGT 531 Personnel and Human Resources Management
MANGT 622 Decision Analysis
MANGT 639 Advanced Labor Relations
ECON 627 Contemporary Labor Problems

Group B

PSYCH 563 Gender Issues in the Workplace
PSYCH 625 Engineering Psychology
PSYCH 564 Psychology of Organizations

Group C

SOCIO 550 Introduction to Social Interaction
SOCIO 570 Race and Ethnic Relations in the U.S.

Group D

POLSC 616 Discrimination and the Law

International Studies

The international studies program is designed to promote understanding of the international community and is characterized by a strong commitment to a multi- and interdisciplinary orientation. The program provides students not only a field of academic study, but also a background for those interested in training for various careers.

The international studies program encourages a substantial distribution of foreign and international course work under the direct, personal guidance of an interdisciplinary faculty committee. Students must enroll in another major before taking international studies as a secondary major.

Students who complete the secondary major in international studies are expected to include the following within their areas of knowledge or competency: (1) speaking capability in a foreign language; (2) basic geographic knowledge of the world; (3) ability to understand and analyze cultures other than their own; (4) some understanding of developmental processes; (5) some understanding of international relations and processes of interaction; (6) some integration of their program of study into a meaningful and coherent whole.

To accomplish the first of these objectives, students must complete the equivalent of four semesters of a modern foreign language. To accomplish the remaining objectives, they must complete 24 hours of course work, distributed as follows:

Geographic Knowledge

GEOG 100 World Regional Geography

Cultural Understanding

ANTH 200
or 201 Cultural Anthropology

Development

At least one course marked D in the approved course list.

International Relations

At least one course marked I in the approved course list.

Program Integration

DAS 425 Senior Research in International Studies or approved alternative.

During either semester of the senior year, the student will write a research paper or complete a project on an international topic. The research may be an honors thesis or design project in one of the participating colleges, or it may involve independent study. Students may enroll in DAS 425 or in an approved alternative course, such as GENAG 505 or ARCH 702. In all cases, the student must have the permission of a faculty member to supervise and evaluate the work. All students enrolled in "Senior Research in International Studies" must have their topics approved by the director of the secondary major in international studies.

Depending on the number of students enrolled in the course during any given semester, special class sessions may be scheduled for participants to discuss their work and to share their preliminary findings. As part of the course requirements, students will be expected to present their final paper or project, or a summary of the same, at a meeting of students and faculty in international studies.

The intent of "Senior Research in International Studies" is to provide a mechanism for students to explore in depth a significant problem or issue of international scope and importance. Students will be encouraged to consult faculty in various disciplines and to use skills and knowledge from previous international and area studies courses in their research.

Electives

The remaining 9 hours may be taken from the approved course listing. No more than 6 hours (of the 24) may be applied from a single discipline, and no more than 6 hours may be counted toward both a secondary major in an area studies program and in international studies. Students are encouraged to take courses in at least two of the following colleges: agriculture, architecture and design; arts and sciences, business, and human ecology. Students are encouraged to consult with their international studies

advisor on the design and coherence of their international studies program.

Courses listed below are those for which students may receive credit in the international studies program. Alternative courses may be approved by petition to the director of the international studies program.

Interdisciplinary

DAS 425. Senior Research in International Studies. (3) I, II. A research paper or project on an international topic. In order to complete supervised independent study, students will make presentation of the final paper or project report. Pr.: Completion of 15 hours of course work in international secondary major. DAS-425-0-4903.

College of Agriculture

AGRON 430 Tropical Agronomy 2
GENAG 505 Comparative Agriculture 1-4
AGEC 615 International Agricultural Development 3 D

College of Architecture and Design

ARCH 702 Architecture Design Studio VI 5
LAR 702 Landscape Architecture Design Studio VI 5
IAR 702 Interior Architecture Design Studio VI 5
ARCH 655 Foreign Seminar (var.)

College of Arts and Sciences

Anthropology

ANTH 200 Introduction to Cultural Anthropology 3
ANTH 201 Introduction to Cultural Anthropology, Honors 4
ANTH 220 Introduction to Linguistic Anthropology 3
ANTH 505 Introduction to the Civilization of S. Asia I 3
ANTH 506 Introduction to the Civilization of S. Asia II 3
ANTH 507 Folk Cultures 3
ANTH 511 Cultural Ecology and Economy 3
ANTH 512 Political Organization in Folk and Nonliterate Cultures 3
ANTH 532 Mexican and Central American Indians 3
ANTH 536 Black Cultures of the Americas 3
ANTH 545 Cultures of India and Pakistan 3
ANTH 550 Cultures of Africa 3
ANTH 604 Culture and Personality 3
ANTH 633 Gender, Power, and International Development 3
ANTH 634 Indian Cultures of South America 3
ANTH 685 Race and Culture 3
ANTH 736 Applied Agricultural and Rural Change 3

Economics

ECON 505 Introduction to the Civilization of S. Asia I 3
ECON 506 Introduction to the Civilization of S. Asia II 3
ECON 636 Capitalism and Socialism 3
ECON 681 International Trade 3 I
ECON 682 Economics of Underdeveloped Countries 3 I

Geography

GEOG 440 Geography of Natural Resources 3
GEOG 450 Geography of Economic Behavior 3
GEOG 460 Future Worlds 3
GEOG 620 Geography of Latin America 3
GEOG 640 Geography of Europe 3
GEOG 650 Geography of the Soviet Union 3

GEOG 710 Geography of Hunger 3 D
GEOG 715 World Population Patterns 3
GEOG 730 World Agricultural Systems 3 D

History

HIST 505 Introduction to the Civilization of S. Asia I 3
HIST 506 Introduction to the Civilization of S. Asia II 3
HIST 543 The U.S. and World Affairs, 1776-Present 3
HIST 544 History of U.S.-Soviet Relations Since 1917 3 I
HIST 560 Latin American Nations 3
HIST 573 Twentieth-Century Europe 3
HIST 574 Europe Since World War II 3
HIST 577 European Diplomatic History Since Napoleon 3 I
HIST 595 Modern European Culture 3

Journalism and Mass Communications

JMC 670 International Communications 3

Modern Languages

FREN 502 French Literature in Translation 3
GRMN 502 German Literature in Translation 3
RSSN 504 Russian Literature in Translation: The 19th Century 3
SPAN 505 Spanish Literature in Translation 3
MLANG 507 European Literature in Translation 3
RUSSN 508 Russian Literature in Translation: The Soviet Period 3
FREN 514 French Civilization 3
GRMN 530 German Civilization 3
SPAN 565 Spanish Civilization 3
SPAN 566 Hispanic-American Civilization 3

Political Science

POLSC 505 Introduction to the Civilization of S. Asia I 3
POLSC 506 Introduction to the Civilization of S. Asia II 3
POLSC 545 The Politics of Developing Nations 3 D
POLSC 621 European Politics 3
POLSC 622 Latin American Politics 3
POLSC 623 South Asian Politics 3
POLSC 624 Middle Eastern Politics 3
POLSC 625 Southeast Asian Politics 3
POLSC 626 African Politics 3
POLSC 627 Soviet-Style Regimes 3
POLSC 628 Comparative Security Establishments 3
POLSC 629 Administration in Developing Nations 3 D
POLSC 641 International Relations 3 I
POLSC 642 International Conflict 3 I
POLSC 645 International Politics of Europe 3 I
POLSC 647 International Law 3 I
POLSC 649 International Defense Strategies 3 I
POLSC 651 International Organization 3 I
POLSC 652 International Politics of S. Asia 3 I
POLSC 653 International Politics of the Middle East 3 I

Sociology

SOCIO 505 Introduction to the Civilization of S. Asia I 3
SOCIO 506 Introduction to the Civilization of S. Asia II 3
SOCIO 633 Gender, Power, and International Development 3 D
SOCIO 734 Sociology of Agricultural Development 3 D
SOCIO 736 Applied Agricultural and Rural Change 3
SOCIO 740 Comparative Social Systems 3
SOCIO 742 Society and Change in S. Asia 3

College of Business Administration

FINAN 554 International Financial Management 3
MANGT 690 International Management 3
MKTG 544 International Marketing 3 I

College of Human Ecology

FN 702 Nutrition in Developing Countries 3

For more information about the secondary major in international studies, contact Charles Bussing, Department of Geography, 202 Dickens Hall, Manhattan, Kansas 66506, 532-6327.

Latin American Studies

The secondary major in Latin American studies complements course work by students in their chosen majors. Course requirements in at least four disciplines provide a diverse introduction to Latin American culture. The senior seminar allows students to do independent study using information sources from different disciplines.

To complete the course requirements for the secondary major students must complete two years (four semesters) of Spanish or Portuguese or have equivalent competence in either language. Students must also select 21 hours of course work in a minimum of four departments. No more than 9 hours in any department may be counted as part of secondary major requirements. The senior seminar in Latin American studies is required.

The following courses are those for which students may receive credit for the secondary degree in Latin American studies. Courses not listed here may be approved as deemed appropriate by the Latin American studies committee, and could be accepted in addition to the approved list.

Language requirement

Two years of Spanish or Portuguese or equivalent competence in either language

Area courses

21 hours; in addition to the Senior Seminar, courses must be taken in a minimum of four departments

Interdisciplinary (required)

College of Arts and Sciences

DAS 407 Senior Seminar in Latin American Studies

College of Agriculture

GENAG 505 Comparative Agriculture: Latin America

College of Arts and Sciences**Anthropology**

| | |
|----------|---|
| ANTH 532 | Mexican and Central American Indians |
| ANTH 536 | Black Cultures of the Americas |
| ANTH 555 | Black Music of the Americas |
| ANTH 634 | Indian Cultures of South America |
| ANTH 673 | Pre-Columbian Civilizations of Mexico and Guatemala |

Geography

| | |
|----------|----------------------------|
| GEOG 620 | Geography of Latin America |
|----------|----------------------------|

History

| | |
|----------|---------------------------|
| HIST 560 | Latin American Nations |
| HIST 561 | Colonial Hispanic America |
| HIST 562 | Modern Mexico |

Modern languages

| | |
|----------|---|
| SPAN 563 | Introduction to the Literature of Spanish America |
| SPAN 566 | Hispanic-American Civilization |
| SPAN 751 | Spanish-American Narrative to 1950 |
| SPAN 752 | Contemporary Spanish-American Literature |
| SPAN 755 | Spanish-American Poetry and Drama |
| SPAN 772 | Hispanic World Today |

Political science

| | |
|-----------|-------------------------|
| POLSC 722 | Latin American Politics |
|-----------|-------------------------|

For more information about the secondary major in Latin American studies, contact Bradley Shaw, Department of Modern Languages, Eisenhower Hall, Manhattan, Kansas 66506.

South Asian Studies

Aruna Michie, Director

South Asian studies at KSU focus on the geographic, linguistic, and cultural regions of Afghanistan, Bangladesh, Pakistan, India, Nepal, Sri Lanka, Bhutan, and the Maldives Republic.

The basic South Asia courses at KSU are Introduction to South Asian Civilizations I and II, taught jointly by South Asia faculty from the Departments of History; Political Science; Geography; and Sociology, Anthropology, and Social Work. These courses may be taken by any undergraduate and credit may be received in any one of the participating departments. Advanced courses in South Asian studies and related subjects are taught in all of these departments and the Department of Economics. In addition, language training is offered in Urdu (the national language of Pakistan and a major language in India) and Hindi (the official language of India). Instruction also may be available, upon sufficient demand, in other South Asian languages. These languages may be used to satisfy requirements for the bachelor of arts and higher degrees.

Secondary major

Students completing a required number and distribution of language and area studies courses may earn a secondary major in South Asian studies. This secondary major is open to any student at KSU. A student receives, along with the primary major, a broad interdisciplinary education

concerning the Indian subcontinent, whose people constitute 20 percent of humanity and who are the inheritors of ancient and highly sophisticated civilizations famous in the West for their religions, philosophy, music, art, literature, architecture, and science. Students are prepared for graduate work on South Asia or may specialize in various careers.

This interdisciplinary program is administered through the South Asia Center. Students who wish to have a secondary major in South Asian studies file an academic data sheet with the center. All courses in the program are approved by South Asia faculty, who have the responsibility to decide which courses are to be included within the program. Transfer students should apply to the South Asia Center to have their course work validated for this major. If a course is accepted by KSU, it may then be applied to the South Asian studies major. The center faculty act as advisors to those students within this program. The advisory function, however, is limited to this program and does not replace the position of the student's first major advisor.

Course requirements for the secondary major in South Asian studies:

Language requirement

The first two years of Hindi/Urdu or equivalent competency in a South Asian language.

| | |
|----------|----------------|
| URDU 171 | Hindi/Urdu I |
| URDU 172 | Hindi/Urdu II |
| URDU 273 | Hindi/Urdu III |
| URDU 274 | Hindi/Urdu IV |

South Asian civilizations

One course required.

| | |
|---------|------------------------------|
| xxx 505 | South Asian Civilizations I |
| xxx 506 | South Asian Civilizations II |

(Cross-listed in the six participating departments: anthropology, economics, geography, history, political science, and sociology.)

Area course requirement

Four of the courses listed below in at least three fields. One of the four may be drawn from the auxiliary list with approval of the South Asia committee.

See appropriate college section of this catalog for further description.

Economics

| | |
|----------|----------------------------------|
| ECON 699 | Seminar in Economics: South Asia |
|----------|----------------------------------|

History

| | |
|----------|--|
| HIST 350 | Gandhi and the Indian Revolution |
| HIST 504 | History of Hinduism |
| HIST 598 | Topics in Non-Western History (South Asia) |

Political science

| | |
|-----------|--------------------------------------|
| POLSC 623 | South Asian Political Systems |
| POLSC 652 | International Politics of South Asia |

Sociology/Anthropology

| | |
|-----------|----------------------------------|
| SOCIO 742 | Society and Change in South Asia |
| ANTH 545 | Cultures of India and Pakistan |

Auxiliary courses

| | |
|-----------|--|
| AGEC 615 | International Agricultural Development |
| ECON 636 | Capitalism and Socialism |
| ECON 682 | Economics of Underdeveloped Countries |
| POLSC 545 | Politics of Developing Nations |
| POLSC 629 | Administration of Developing Nations |
| SOCIO 734 | Sociology of Agricultural Development |
| SOCIO 740 | Comparative Social Systems |
| ANTH 507 | Folk Cultures |
| ANTH 511 | Cultural Ecology and Economy |
| MKTG 544 | International Marketing |
| MANGT 690 | International Business |

Graduate work

See the Graduate School section of this catalog.

Cultural events

In addition to its on-campus instructional program, the center sponsors occasional cultural events, colloquia, visiting public speakers, a film series, and courses and public lectures at other institutions. It also provides audiovisual support, training, and consultation to elementary and secondary teachers interested in developing South Asia units in their curricula.

For further information on South Asian studies, contact the director, South Asia Center, 22 Eisenhower Hall, Manhattan, Kansas 66506, (913) 532-5738.

Women's Studies

Sandra Coyner, Director

Professors Bixler, Gray, McElroy, Oukrop, and Saal; Associate Professors Anderson, Benson, Coyner, Culley, Hausmann, and Scott; Assistant Professors Huff-Corzine and Zschoche.

The women's studies program focuses on women, whose changing roles and expectations are the most profound and widespread social phenomenon of our time. All social institutions, from politics and industry to the family and the arts, are affected by these changes, as are all individuals. Traditional expectations no longer hold, as an entire society adjusts to the fact that most women will work outside the family most of their lives and are entitled to equal opportunities with men in all spheres of life.

Courses in women's studies examine various aspects of women's lives, including not only the barriers and prejudices that still hold women back but also women's achievements against the odds. Some courses focus on the nature of sex differences and gender roles. Others focus on the interrelationships between women, gender roles, and the major institutions which shape our society. Humanities courses explore images and achievements of women in a wide range of creative media. History and anthropology discuss interrelationships of women and men in various cultural contexts across time and around the world.

Women's studies are direct preparation for many careers which serve, counsel, or communicate about women. A secondary major in women's studies combines especially well with such majors as journalism, any form of counseling, or pre-law. Women's studies is also an excellent liberal arts concentration, forming a firm basis for graduate work in any liberal professional field.

To complete the secondary major, a student must take two required courses (Introduction to Women's Studies and Senior Seminar in Women's Studies), and 18 semester hours in elective courses from the Colleges of Arts and Sciences, Education, or Human Ecology, for a total of 24 semester hours. Elective courses must be taken in at least two colleges. Courses in the women's studies program also may serve to meet general education and major requirements, and interdisciplinary courses may be counted as either humanities or social sciences. The courses listed below have been approved for credit toward the secondary major in women's studies.

For more information or advising in women's studies, contact Sandra Coyner, director, 22 Eisenhower Hall, (913) 532-5739.

Interdisciplinary courses

*xxx 105. **Introduction to Women's Studies.** (3) I, II. A systematic introduction to women's studies as an academic discipline, drawing research from humanities, social science, education, home economics, and management to analyze images of women, status of women, sex differences, gender roles and stereotypes, patterns of success, women and relationships, current controversial issues affecting women, and feminism as a social and historical movement. An academic perspective on issues of equality and justice for women, emphasizing scholarship on how women perceive their own lives. xxx-105-0-4903

*xxx 405. **Senior Seminar in Women's Studies.** (3) I. An intercollegiate, interdisciplinary course organized typically with students presenting papers which draw upon previous and concurrent academic experience and which approach a given topic with a consistent focus on the role of women. Provides supervised independent study and subsequent discussion, allowing students to integrate and order their perceptions about the unique roles, problems, and contributions of women. Pr.: Introduction to Women's Studies and 15 hours of women's studies courses. xxx-405-9-4903

*xxx 505. **Independent Study in Women's Studies.** (1-3) I, II. Independent, interdisciplinary, supervised studies in an area of women's studies which does not fall within the boundaries of a traditional department. May be repeated once for credit with change of topic. Pr.: Junior standing, consent of instructor(s), and approval of women's studies faculty. xxx-505-0-4903

*xxx 506. **Contemporary Feminist Frameworks.** (3) II. Surveys major contemporary U.S. theories of gender and their development, including impact of feminist movement on the development of theory, interactions of race and gender, women's culture and men's roles. Compares approaches of social sciences and humanities. Pr.: Six hours of women's studies. xxx-506-0-4903

*To enroll, use one of these prefixes: DAS, College of Arts and Sciences; DED, College of Education; DHE, College of Human Ecology; GENBA, College of Business Administration

Women's studies courses offered by departments

See appropriate college sections in this catalog for further description.

College of Arts and Sciences:

Anthropology

ANTH 508 Male and Female: Cross-Cultural Perspectives
ANTH 633 Gender, Power, and International Development

Art

ART 654 Women in Art
ART 695 Topics in Art History (when offered as "Women in Photography")

Biology

BIOL 397 Topics in Biology (when offered on "Science, Sex, and Society")

English

ENGL 515 Literature and Society (when offered on "Third World Women Writers")
ENGL 525 Women in Literature
ENGL 699 Special Studies (when offered as "American Women's Autobiographical Writings")

History

HIST 512 Women in European History
HIST 533 Topics in the History of the Americas (when offered as "Gender Roles, Sexuality, and the American Medical Profession, 1800-Present," "Women in Latin American History," or "Women and the Family, 1607-1870")
HIST 541 Women in American History
HIST 563 Topics in Comparative History (when offered as "Feminism: History and Theory")
HIST 598 Topics in Non-Western History (when offered as "Women in the Middle East")
HIST 928 Seminar in American History (when offered as "Women's History")
HIST 930 Seminar in Modern European History (when offered as "Female Domesticity in Preindustrial Europe")

Journalism and mass communication

JMC 612 Women and the Media

Philosophy

PHILO 150 Introduction to the Philosophy of Feminism
PHILO 665 Philosophy of Feminism

Physical education and leisure studies

PE 775 Issues of Women and Sports

Political science

POLSC 606 Sex and Politics
POLSC 799 Pro-Seminar in Political Science (when offered as "Women and Law")

Psychology

PSYCH 540 Psychology of Women
PSYCH 543 Women and Mental Health Issues
PSYCH 563 Gender Issues in the Workplace
PSYCH 790 Topics in Psychology (when offered as "Feminist Therapy" or "Nonsexist Psychology")
PSYCH 959 Seminar in Social Psychology (when offered as "Psychology of Women")

Social Work

SOCWK 543 Women and Mental Health Issues
SOCWK 610 Topics in Social Work (when offered as "Violence Against Women")

Sociology

SOCIO 545 The Sociology of Women
SOCIO 633 Gender, Power, and International Development

Speech and theatre

SPCH 630 Topics in Rhetoric and Communication (when offered as "Feminism and Rhetoric")
THTR 782 Women in Theatre

College of Education

Administration and foundations
EDAF 786 Topics in Education (when offered as "Programming for Women's Concerns")

Adult and occupational education

EDAO 750 Women, Education, and Work

Curriculum and instruction

EDCI 735 Curriculum Materials for Nonsexist Teaching

College of Human Ecology

Human development and family studies

HDFS 300 Problems in Family and Child Development (when offered as "The Mature Woman: Middle Age and Later Years")
HDFS 302 You and Your Sexuality
HDFS 350 Family Relationships and Sex Roles
HDFS 600 Economic Status of Women
HDFS 708 Topics in Family and Child Development (when offered as "The Legal Rights of Women")
HDFS 865 Human Sexuality

Honors Programs

Students at Kansas State University may enroll in honors programs in seven colleges: agriculture, architecture and design, arts and sciences, business administration, education, engineering, and human ecology.

Questions honors students often ask:

What is the purpose of KSU honors programs?

First, to identify gifted, enthusiastic, ambitious, highly imaginative students and to provide special courses that relate to but are different from regularly scheduled courses. Second, to provide this group of students with a sense of community by bringing them together in different academic situations so that they may benefit from both academic and social exchanges.

How do honors classes differ from regular classes?

Most honors classes are smaller in enrollment and depend more heavily upon student investigation and reporting than do regular classes. There is likely to be greater opportunity for students to set their own academic directions and to investigate issues and problems of their own particular interests. Honors classes are related to other classes in the University, however, in that they provide important basic introductions to various disciplines. The distinguishing characteristic of honors classes is the students themselves, who are typically more energetic, more critical, more inquisitive, and more committed to intellectual inquiry. Honors students love to learn.

What are the rewards of completing the honors program?

The real answer to this question is, of course, the intangible reward of having learned as much as one can in a course of study that has been challenging and exciting, whatever one's academic interests or professional goals. More specifically, the honors student may expect that critical skills will have been sharpened and investigative powers strengthened by the special projects which the honors program will have provided. The unique emphasis upon independent study and individualized curricular planning are other sources of academic growth for the honors student. Successful completion of the honors program is recorded on a student's transcript and diploma so that the effort made to complete the undergraduate degree in challenging circumstances will be clear to everyone who looks at an honors student's record.

What honors opportunities are available to me if I am enrolled in an honors program at KSU?

These opportunities may, perhaps, be best described by considering the individual honors programs of the University separately. All honors courses are open to all honors students, regardless of which college they enroll in.

Agriculture

The honors program in the College of Agriculture encourages students to recognize and respond to the challenges of scholarly inquiry in various areas of professional and scientific agriculture. It also enables students to investigate some of the related social, political, economic, and international issues which are of concern to agriculturists everywhere.

The program provides honors students with greater curriculum flexibility, which encourages breadth and depth of study in one or more specific areas. It also exposes honors students to various areas of interest in agriculture. Each student in the program has a committee of three faculty members who assist the student in developing a program of study and in planning for independent research activities.

Students who have attained a cumulative GPA of 3.5 or higher in 12 or more completed hours at Kansas State University will be invited to participate in the College of Agriculture honors program, typically at the end of their sophomore year. Community college transfers will be invited into the program following their first semester if they have met the GPA requirement.

Students seeking to enroll in the program will meet with the honors committee member from the department involved and, with an advisor, will develop an honors curriculum tailored to the student's particular goals. The student, with advice from the advisor, honors committee member, and other involved faculty member(s), will prepare a short proposal outlining the honors project. This proposal must be approved by the honors advisory committee of the College of Agriculture.

The honors advisory committee will review the proposals for possible scholarship funding priority. These honors project scholarships will be used exclusively for materials and supplies necessary for the completion of the student's honors project.

Architecture and Design

The honors program in the College of Architecture and Design is intended for those students who wish to be challenged by scholarly inquiry beyond the requirements of regular courses. Information can be obtained in the dean's office, 532-6846.

Arts and Sciences

The honors program in the College of Arts and Sciences is available to all students who enroll in the college. Freshmen register for the noncredit seminar, DAS 010, Introduction to the Honors Program in Arts and Sciences, which is offered every semester. In this seminar students become acquainted with the honors program and with the unique opportunities for them in the College of Arts and Sciences. They become acquainted with other students in the program, as well as with many members of the faculty in the college.

Students with high ACT scores may elect special honors sections of lower-division courses including English Composition I. Participants in the program are required to take ENGL 125, English Honors Composition II.

After completing both the orientation course and English Honors Composition II, achieving a grade point average of 3.5 in one semester and an overall grade point of 3.3 for the freshmen year, students are admitted to upper-level honors course work. Sophomore seminars, junior colloquia, and a senior research project provide a rich array of honors experiences.

Business Administration

The honors program in the College of Business Administration enables students to develop broad intellectual interests and investigate current issues and research related to business and industry. Seminars, lectures, and convocations on topics of interest to business students will be offered.

Education

The honors program in the College of Education is for those undergraduate students who have demonstrated high academic achievement. The major purpose of the honors program is to give selected students an opportunity to expand their knowledge of the teaching profession and to acquire a desire to be leaders in that profession. The program is designed for students in the College of Education and other students who are completing a teacher certification program through another college at Kansas State University.

Students in the education honors program will: explore at greater depth the professional education topics which are a part of the required program for teacher certification; encounter and pursue issues and special interests within the field of education; engage in forums which enable them to interact in challenging academic settings with faculty and other honor students within the University; and seek greater self-improvement as professional teachers.

Admission to the honors program in education will be granted after the student:

1. Presents a written statement of interest in the program.
2. Submits an ACT composite score of 28 or higher or evidence of a cumulative grade point average of 3.5 in a minimum of nine semester hours of college work.
3. Enrolls in the noncredit course, DED 010, Introduction to the Honors Program.
4. Has a satisfactory interview with a faculty member of the honors program coordinating committee.

The academic work in the program includes a special section of EDAF 315, Educational Psychology; DED 320, Honors Seminars; and DED 420, Honors Research. Honors seminars, offered each semester, focus on topics that broaden the knowledge of future teachers and give them insight into leadership responsibilities in their professions.

Honors Research, DED 420, provides the opportunity for students to work with professors having similar research interests. Research topics may be selected from a wide range and they may reflect the student's particular interests. Students are encouraged to develop creative approaches to problems pertinent to the educational process.

Engineering

The honors program in the College of Engineering is open to entering freshmen with high school averages or KSU entrance exam scores within the top five percent of students entering the college. Qualified transfer students and upperclassmen also may join the program, following individual evaluations of their academic records. Honors students are entitled to enroll in special sections of many basic courses that offer them opportunities for close association with faculty and with similarly gifted and motivated students.

In the freshman and sophomore years students participate in a variety of college seminars and colloquia, which enrich and broaden their educational experience. Recent seminar and colloquium titles include "Alternative Energy Sources," "Limits to Growth," "Priorities in the Use of Energy," and "Professionalism in Modern Society." Honors students also are encouraged to individualize their programs of study by a liberal course substitution policy, which helps to meet their individual interests.

In the junior and senior years students work on an independent research or design project carried out under the direction of a faculty member. These projects provide not only close association with the faculty advisors but the opportunity to express creative abilities and to complete an extended investigation into a topic of personal interest. Recent topics have included the location of new power plants, the development of a walking robot, and response measurements in nuclear detection equipment.

Human Ecology

Students in the College of Human Ecology are selected for membership in the honors program according to ACT scores or, in the case of transfer students and other students who have completed some college course work, achievement of a requisite grade point average.

The program recognizes students for outstanding academic achievement and encourages participation in and appreciation of research. Honors students have the opportunity to explore areas outside their major field of study and to interact with graduate students and faculty members at various events and activities.

In the junior or senior year, students complete honors projects on topics of their choice. They develop these projects with human ecology faculty advisors, and with the approval of the human ecology honors coordinator. This independent study may involve extensive reading in a selected area, field study, experience with a research project, or participation in an academic activity that will significantly increase the student's knowledge in an area of interest.

Academic Honoraries

Major academic honor societies at KSU include Phi Beta Kappa, the nation's oldest academic honorary, Golden Key, and Phi Kappa Phi. Honors students aspire to membership in these societies, as well as in many others which are more closely related to specific academic disciplines throughout the University.

Graduate School

Timothy R. Donoghue, Vice Provost for Research and Dean

Gerald R. Reeck, Associate Dean

Robert P. Lowman, Associate Dean

Bert R. Biles, Assistant Dean for Sponsored Programs

F. L. Lee O'Neill, Assistant to the Dean

K. Bobette McGaughey, Assistant to the Dean

John W. Walters, President, KSU Research Foundation

102 Fairchild Hall

532-6191

1-800-232-0133, ext. 6194

Graduate study

Graduate study requires high academic achievement, and it extends the student's experience and capabilities in advanced, specialized areas of the chosen field. With 60 master's programs and 42 doctoral programs, Kansas State University offers preparation for a variety of scholarly and research careers as well as for a wide range of professional positions.

A common objective of graduate programs is to develop the capacities needed for independent study and research. All doctoral programs and most master's programs develop such capacities by requiring students to carry out original research under the direction of faculty members who are experts in their fields. A crucial part of the process involves the preparation and publication of a research study in the form of a thesis or dissertation and a defense of the study before the faculty. In certain professional master's programs the emphasis is on preparation for professional practice, and, although a thorough understanding of research and research methodology is developed, the student may not have to complete a program of original thesis research in such cases.

Students who pursue graduate studies are enrolled in the Graduate School and are subject to the policies of the University's graduate faculty as well as the regulations of their specific programs.

Kansas State University has extensive resources for the conduct of graduate study and research, and the various programs are supported by a combination of state, federal, corporate, and private funding directed through the colleges, the Agricultural Experiment Station, the Engineering Experiment Station, and the Bureau of General Research.

Graduate degrees

Master of science

Agricultural economics
Agricultural engineering
Agronomy
Anatomy and physiology
Animal sciences and industry
Architectural engineering
Agricultural mechanization
Biochemistry
Biology
Chemical engineering
Chemistry
Civil engineering
Clothing, textiles, and interior design
Computer and information sciences
Education
 Adult, occupational, and continuing education
 Educational administration
 Elementary education
 Secondary education
 Special education
 Student counseling and personnel services
Electrical and computer engineering
Entomology
Food science
Foods and nutrition
Genetics
Geology
Grain science and industry
Horticulture
Human development and family studies
Industrial engineering
Institution management
Mass communications
Mathematics
Mechanical engineering
Microbiology
Nuclear engineering
Physical education and leisure studies
Physics
Plant pathology
Psychology
Statistics
Surgery and medicine
Veterinary laboratory medicine
Veterinary pathology

Master of arts

Economics
English
Geography
History
Modern languages
Political science
Sociology
Speech

Master of accountancy

Master of architecture

Master of business administration

Master of fine arts

Master of landscape architecture

Master of music

Master of public administration

Master of regional and community planning

Doctor of education

Adult, occupational, and continuing education
Curriculum and instruction
Educational administration
Educational psychology
Special education
Student counseling and personnel services

Doctor of philosophy

Agronomy
Animal sciences and industry
Biochemistry
Biology
Chemistry
Computer and information sciences
Economics
 Agricultural
 Arts and sciences
Education
 Adult, occupational, and continuing education
 Curriculum and instruction
 Student counseling and personnel services
Engineering
 Agricultural engineering
 Chemical engineering
 Civil engineering
 Electrical and computer engineering
 Industrial engineering
 Mechanical engineering
 Nuclear engineering
Entomology
Food science
Foods and nutrition
Genetics
Geology (Cooperative with University of Kansas)
Grain science and industry
History
Human ecology
Horticulture
Mathematics
Microbiology
Physics
Physiology
Plant pathology
Psychology
Sociology
Statistics
Veterinary pathology

Degree Requirements

Master's degree

Subject to the approval of the major department,* the candidate may choose one of the following program options: (1) a minimum of 30 semester hours of graduate credit including a master's thesis of 6 to 8 semester hours; (2) a minimum of 30 semester hours of graduate credit including a written report of 2 semester hours either of research or of problem work on a topic in the major field; or (3) a minimum of 30 semester hours of graduate credit in course work only, but including evidence of scholarly effort such as term papers or production of creative work, as determined by the student's supervisory committee. Candidates for the master of public administration must complete at least 42 hours, the master of regional and community planning degree a minimum of 48 hours, the master of business administration 33 hours, and the master of fine arts 60 hours.

The student's program of study is prepared with the assistance of a supervisory committee consisting of the major advisor and two other graduate faculty members. The program is subject to the approval of the dean of the Graduate School upon recommendation of the advisory committee and the appropriate department head or program chairman, and should be submitted to the Graduate School prior to the end of the candidate's second term. The program may be modified on further recommendation of the advisory committee and the approval of the graduate dean.

Three copies of theses and reports are required. All such reports and theses will be sent by the Graduate School to the KSU Library and bound in cloth in accordance with specifications for Class A binding of the Library Binding Institute. To cover the cost of binding, students must deposit with their reports or theses a money order made out to the KSU Library. If students desire to publish all or part of their theses before the degree is conferred, major professors should notify the Graduate School in advance by letter. If approved by the major professor, master's theses may be placed on file with University Microfilms, which will also publish an abstract in *Master's Abstracts*. The current fee is \$35. Since master's theses and reports are submitted as a part of degree requirements, the University retains the right to publish any portion as a contribution to knowledge. Patentable items created under University auspices are subject to the Regents' patent policy.

Successful completion of a final oral examination or comprehensive written examination or both shall be required of all master's degree candidates, the specific form being determined by individual departments. The final examination is administered by the advisory committee and may include a defense of the thesis or report, an interpretation of other scholarly products, or a testing of the student's understanding of the field(s) of study.

Doctoral degrees

Normally, students admitted to doctoral study hold the master's degree, but some programs allow highly qualified students to proceed directly from the bachelor's degree to the doctorate. Completing a master's degree at Kansas State University does not automatically lead to admission to doctoral study, and a separate application must be made to the department and approved by the graduate dean for those intending to continue to the Ph.D.

Award of a doctorate requires the successful completion of the equivalent of at least three years of full-time study beyond the baccalaureate as well as the completion of a major research study reported in a doctoral dissertation. Completion of the program involves more than the accumulation of credits, and its duration is variable because the time required to finish the research study cannot be anticipated. In completing research and the resulting dissertation, students must adhere to the enrollment requirements described in the later section on registration and enrollment.

During the first year of study beyond the master's degree or its equivalent, a supervisory committee is formed for each student. Committee members are proposed by the student and major advisor, subject to approval by the department head and the dean of the Graduate School. The committee consists of at least four members of the graduate faculty, one of whom is the major advisor. At least one member must be from a program different from that of the major advisor.

The committee aids the student in the preparation of the program of study (which must be approved by the dean of the Graduate School) and has charge of the preliminary examination. At least one semester before the preliminary examination is arranged, the student must have on file in the Graduate School a program of study approved by the supervisory committee.

Ordinarily, at the close of the second year of graduate study and at least seven months before the final examination, the student must have met the preliminary examination requirement, successful completion of which is a necessary condition for admission to doctoral candidacy. The supervisory committee is responsible for recommending

candidacy to the Graduate School. At this time the graduate dean appoints an outside chairperson. Early in the graduate work a dissertation subject is chosen in the major field and approved by the supervisory committee. The dissertation must represent original investigation that contributes new knowledge or understanding to the candidate's field. On completion of at least three years of graduate study as prescribed by the supervisory committee and on completion of a dissertation, the candidate must pass a final examination.

Final dissertation copies with abstracts must be submitted to the dean of the Graduate School as a last requirement to be met for award of the degree. Inasmuch as the dissertation is submitted to the University in satisfaction of degree requirements, the University retains the right to use or publish any portion thereof as a contribution to knowledge. Moreover, patentable items created under University auspices are subject to the Regents' patent policy.

If consistent with departmental policy, the format of theses and dissertations may be in a style suitable for submission to a professional journal. In such cases, additional introductory material, bibliographies, and other supplementary information not to be submitted with the journal manuscript should be included as appendices.

All dissertations will be bound in cloth in accordance with specifications for Class A binding of the Library Binding Institute. To cover the cost of binding, students must deposit with their dissertation copies a money order made payable to the KSU Library. Each dissertation is microfilmed and an abstract is published in *Dissertation Abstracts*. The current fee is \$45.

If publication of the dissertation, in whole or in part, is to be made before the degree is conferred, the major professor should notify the dean of the Graduate School by letter in advance of such publication. Publication of any part of a dissertation should show, through footnote or otherwise, that the material is from a dissertation presented in partial fulfillment of the requirements for the degree doctor of philosophy in the subject department at Kansas State University. The written approval of the major professor should be filed in the Graduate School office in the case of any student seeking to copyright a dissertation.

Doctor of education

The Ed.D. is offered through the College of Education. While many of the requirements are the same as those for the Ph.D. and are noted in another section of this catalog, the Ed.D. has some that are unique. Residence for the Ed.D. may be accomplished by one of the following patterns: four summers within a five-year

*As used in the Graduate School the term "department" refers to interdepartmental graduate groups as well as to departmental faculties in the usual sense.

period in which 27 hours of course work are completed; three summers within a four-year period in which 24 hours of course work are completed, with a minimum of 6 hours of course work completed in one intervening semester; 24 hours of course work within 12 calendar months.

A total of 94 semester hours must be completed. Up to 30 hours for a master's degree and at least 16 hours of dissertation research may be included as part of the total. See the College of Education section of this catalog for additional specific requirements for the Ed.D.

Doctor of philosophy

Students admitted to Ph.D. programs must complete a year of full-time study in residence at Kansas State University during which they must complete at least 24 hours of regular degree credit requirements. Furthermore, a minimum registration of 30 hours in research is required, not including work done toward a master's degree. Programs must include at least 90 semester hours.

The foreign language requirement for the Ph.D. is determined as a matter of policy by the graduate faculty in each department. There is no such requirement in the following programs: agronomy, animal sciences, economics, education, food science, foods and nutrition, genetics, grain science, human ecology, horticulture, pathology, plant pathology, psychology, and sociology. For all other programs the department should be consulted for details of the foreign language requirement.

Where a language is required, it is understood that "foreign language" refers to languages other than English and that the language(s) required would have a significant body of literature relevant to the field. Required foreign language examinations are administered by the Department of Modern Languages. The language requirement must be satisfied before the student is admitted to candidacy.

Student responsibility

Graduate students are held responsible for knowing all published academic policies and degree requirements. They are likewise held responsible for knowing the regulations concerning the degree they plan to take and any special requirements within the department or academic unit. In addition, it is the student's responsibility to be informed of the University's policies regarding the standard of work required for continued enrollment in the Graduate School. The Graduate School office should be consulted if additional information is needed.

Note to graduate students

Although it is customary for many graduate students to work continuously throughout the year, especially on thesis and disserta-

tion research, the major advisor or certain supervisory committee members may not be available during the summer months. This is especially the case for faculty members on nine-month appointments who may be pursuing other activities off campus during that time. Students should take such possibilities into account in scheduling various examinations and thesis or dissertation reviews.

Graduate credit

The course and research requirements for graduate degrees are expressed in terms of graduate credit. Graduate credit may not be earned by examination or by correspondence.

Grades

The following grades are used in the Graduate School: A, B, C, D, F, Credit, No Credit, Incomplete, and Withdrawn. A candidate for an advanced degree must have a 3.0 grade point average and make a grade of B or better in three-fourths of the credit hours attempted at KSU (excluding research). To count for graduate credit the grade in a course must be C or better and no course may be counted more than once. Retaken courses remain on the transcript and are considered as part of the record. A graduate student's record will be reviewed after the completion of each session.

Academic probation and dismissal

Admission to and continuation in the Graduate School depend upon a high level of achievement. Students who do not maintain satisfactory progress in their studies are subject to being placed on probation or denied the privilege of continued enrollment in the University or in a specific graduate curriculum. In either case, they will be so notified by the dean of the Graduate School. No student on probation may receive a graduate degree.

A graduate student may be denied continued enrollment in the University or in the graduate curriculum in the case of:

- (a) failure to satisfy conditions necessary for removal from probationary status;
- (b) the accumulation of 6 or more semester hours of work with grades of less than B, and/or a grade point average less than 3.0, exclusive of research;
- (c) failure to meet published departmental requirements or failure in qualifying examinations, preliminary examinations, or final degree examinations;
- (d) demonstrable lack of diligence in removal of assigned deficiency courses, in meeting published degree requirements, or in maintaining normal progress toward a graduate degree; and
- (e) failure to acquire mastery of the methodology and content of one's field sufficient to complete a successful thesis or dissertation. A student denied the privilege of continued enrollment may petition the graduate dean for reinstatement to the

same curriculum or for admission to a different curriculum.

Nongraded work

At the discretion of the graduate faculty of the department concerned, seminars or colloquia in which letter grading conflicts with the objectives intended may be offered on a Credit/No Credit or Pass/Fail basis rather than for a letter grade. The seminars and colloquia which are to be offered for Credit/No Credit or Pass/Fail shall be listed with the dean of the Graduate School. All courses on the program of study except research (report, thesis, or dissertation) and seminars or colloquia which have been approved for Credit/No Credit or Pass/Fail must be taken for letter grades. All research credit hours must be graded as Credit/No Credit. Independently of the program of study, additional courses may be taken on a Credit/No Credit or Pass/Fail basis with the approval of the major professor and the professor offering the course. These courses may not be applied toward a degree. No more than 3 hours of Credit/No Credit or Pass/Fail courses may appear on the program of study for the master's degree nor more than 6 for the Ph.D.

Validation of credits

Kansas State University credits which have been acquired more than six years prior to receiving a master's degree or seven years prior to receiving a Ph.D., require validation either by repeating the course, by passing an advanced course in the subject, or by successfully completing a validation examination. Credits transferred from other universities may not be validated. However, credits in a doctoral program which have been earned as part of a master's degree remain valid and require no further validation. Validation is to be completed at least one semester before the effective date of the degree. The preliminary examinations may not be used for validation.

Assistantships and Fellowships

In order to support research, scholarship, and the acquisition of advanced degrees, the University offers several kinds of financial aid for graduate students. These include fellowships, traineeships, teaching assistantships, and research assistantships. Applications for graduate teaching assistantships and graduate research assistantships should be made directly to the department concerned before March 15 for the following academic year.

Award of assistantships is based on the student's ability and promise and is usually

made for either nine or twelve months. The maximum appointment is for half time, but appointments for lesser fractions also may be made. Students are eligible for staff fees during each term in which they hold an appointment for at least 0.4 time. In addition, students who have been on appointments for at least 0.4 time during the spring term are eligible for staff fees during the following summer term even though they do not hold assistantships. The maximum enrollment for assistants is 10 hours for half-time and 12 hours for 0.4-time appointments; the minimum is 6 hours in the regular terms and 3 in the summer. The corresponding maximums for a summer term are 5 and 6 hours respectively. Students desiring such appointments may obtain application blanks from the head of the department concerned.

All prospective graduate teaching assistants who are non-native speakers of English shall be required to achieve a minimum score of 220 on the TSE to be eligible for employment. All prospective graduate teaching assistants shall have their spoken English competency assessed prior to any teaching assignment through an interview with not fewer than three institutional personnel. Any graduate teaching assistant having classroom or laboratory instructional responsibility and/or direct tutorial responsibilities, other than for courses or sessions conducted primarily in a foreign language, found to be potentially deficient shall be required to achieve a minimum score of 220 on the TSE even if such student has previously achieved such score prior to appointment.

In addition to assistantships the University has a number of fellowships and traineeships available. Several departments also have federally supported traineeships available under the programs of the National Institutes of Health and other agencies.

Admission

Admission to graduate study does not imply admission to candidacy for an advanced degree. For a doctoral degree such candidacy is confirmed only upon successful completion of preliminary examinations.

Correspondence regarding admission to the Graduate School should be addressed to the appropriate department, which will supply application blanks and supplementary information about its program. Applicants should see that each undergraduate or graduate institution previously attended sends official transcripts directly to the appropriate department head. The application and transcripts should be received by the department at least three months before the time the student expects

to enroll. All transcripts become part of the student's official file and may not be returned.

All new graduate students are required to fill out a medical history form for Lafene Health Center.

Entrance requirements

An application for admission to the Graduate School ordinarily implies the student's intention to work toward an advanced degree. To be considered for admission with full standing the applicant must have:

A bachelor's degree from an institution accredited by one of the regional accrediting associations.

Adequate undergraduate preparation in the proposed major field or equivalent evidence of an appropriate background for undertaking an advanced degree program.

An undergraduate average of B or better in the junior and senior years.

Applicants to the Graduate School at K-State must have a bachelor's degree substantially the same as the ones granted by K-State. These degrees regularly contain a broad range of courses representing the basic academic disciplines. In addition, a major portion of the courses included should be graded by a multilevel system, usually A, B, C, D, F.

Applicants holding degrees not meeting these standards may be denied admission to graduate degree programs at KSU. Admission will be denied to applicants possessing bachelor's degrees with a significant amount of credit awarded for work experience that was not supervised by a faculty member of an accredited university nor evaluated in units which identify the academic content. On the other hand, a limited amount of credit for experience, when awarded as an acceptable part of a bachelor's degree for internships, field experience, or the like, will not be cause for denial of admission, but it must be clearly delineated as graded work.

For those whose grades do not meet the above standards, probationary admission may be granted, provided there is other evidence that the applicant has the ability to do satisfactory graduate work. Such evidence might include an excellent record of postgraduate work at another institution, or high scores on the Graduate Record Examination or the Miller Analogies Test. Those who wish to take the Graduate Record Examination should apply to Educational Testing Service, Box 955, Princeton, New Jersey 08540. The fee for either test must be paid by the applicant.

Students may be admitted provisionally if there is uncertainty in evaluating transcripts, as in the case of some international

students, or if there are undergraduate deficiencies which must be removed.

Once admitted, probationary and provisional students will be advised of other conditions to be met to attain full standing. Full standing is attained automatically upon completion of at least 9 hours of course work for graduate credit with a grade of B or better, and upon the removal of any deficiency which was specified at the time of admission. Students admitted on probation may be denied continued enrollment if they do not achieve full standing or if they receive any grade less than a B.

Students who do not plan to work for an advanced degree may be admitted to the Graduate School as special students. Applications from such students should be sent to the department in which they plan to take courses or directly to the Graduate School together with a copy of the official transcript from the institution which granted the undergraduate degree. A special student who later wishes to enter a degree program must undergo the full review process. No more than 9 semester hours earned as a special student may be transferred into a regular degree program.

International students

International applicants for admission to Kansas State University must, in most cases, meet the same academic standards for admission as those required of native students. In addition, international applicants holding nonimmigrant visas are required by U.S. immigration regulations to be enrolled in a full course of study. University regulations require that international students and their dependents (if they are with the student) purchase or be in possession of a medical insurance policy or equivalent coverage. Medical insurance can be purchased on the campus or from other independent agencies.

The Graduate School requires each foreign applicant whose native language is not English to demonstrate facility in the English language by making a satisfactory score on the Test of English as a Foreign Language (TOEFL). This test is required in the interest of ensuring that the student's progress toward a degree is not jeopardized by language difficulties. A score of 550 is required for admission by the Graduate School and some units require higher scores. The TOEFL is offered several times a year in the student's home country through the Educational Testing Service, Princeton, New Jersey. Further information is available from the Graduate School office. Foreign students are advised to take the TOEFL as early as possible to avoid delays in processing their applications for admission.

In addition to the TOEFL all international students entering Graduate School will be required to demonstrate proficiency in written and oral English at the time of enrollment. Students who fail to meet this requirement must enroll in and satisfactorily complete ENGL 075, SPCH 065, or both, as appropriate. Those who are determined to need substantial extra work in English will be strongly advised to participate in the English Language Program.

A special orientation and advising program is conducted for new international students one week before the date of enrollment.

Registration and enrollment

Students who have been admitted to the Graduate School register and pay their fees during the regular registration period.

Students enrolled in short courses or workshops during the summer session may take regularly scheduled courses as long as they are able to attend all sessions of both. The enrollment should not exceed the maximum number of hours allowed in the summer session.

Not more than 16 hours, including those obtained in research, may be assigned in a single semester, nor more than 9 hours during a summer session. If a part of the assignment is for undergraduate credit, a student may be assigned to 17 hours during a semester or 10 hours during a summer session. Full-time staff members of the University may not be assigned to more than 6 hours in one semester, nor more than 3 hours in a summer session, and may enroll only with the permission of their supervisors. (See section on assistantships and fellowships for limitations applying to students holding assistantships.) These limitations apply to classes audited as well as classes for which credit is earned.

Any change in a student's enrollment should be carried out through the regular procedures and must be accompanied by the approval of the student's advisor and the dean of the Graduate School.

All graduate students who have matriculated at Kansas State University and are using faculty time and/or University facilities for research or other academic pursuits must be enrolled. The enrollment should reflect, as accurately as possible, the demands made on faculty time and use made of University facilities. Further, a graduate degree candidate must be enrolled during the semester in which the requirements for a degree are completed.

A student working for the Ph.D. must enroll during the session in which the preliminary examination is taken and subsequently in each semester (summer sessions excepted) until the degree requirements are met and the dissertation is accepted by the Graduate School. Failure

to enroll will result in loss of candidacy. To regain candidacy, the student will be re-examined over the areas covered in his preliminary examinations in a manner to be determined by the supervisory committee.

If it is necessary to interrupt progress toward the degree after the preliminary examination has been passed, the student (or the major professor) may petition for leave of absence for up to one year which subsequently may be renewed. Renewals for those who are meeting a military service requirement will be automatic. The petition must be submitted at least one month before the effective date of leave. Approval must be granted by the major professor, chair of the department or graduate group, and the dean of the Graduate School.

Candidates who have passed prelims and do not live in the vicinity of Manhattan, within 30 miles from campus, may make arrangements to enroll by mail but should request permission for doing so by writing the Graduate School office prior to the enrollment period.

Fees

See the Fees section in the front of this catalog for detailed information. Graduate teaching assistantships on regularly budgeted positions are eligible for reduction of the incidental fee in proportion to the level of their appointments.

Graduate study by seniors

Seniors at Kansas State University who have a B or better average on prior work and who are within two semesters of receiving a bachelor's degree may take up to 9 semester hours of course work numbered 500, 600, and 700 for graduate credit. Those wishing to take more than 9 semester hours must apply for admission and be accepted by the Graduate School.

Organizations, housing, loans

For information about student organizations, graduate student housing, and loans, see the appropriate sections of this catalog.

Interdepartmental Degree Programs

The Graduate School recognizes the importance of programs involving interrelationships between fields and has established graduate faculty groups to plan programs and supervise research in interdisciplinary fields. These programs are described in the following paragraphs. For information regarding these programs write to the chair of the appropriate program in care of the Graduate School.

Animal breeding

R. R. Schalles, Chair

Professors Craig, Kemp, Schalles, and Simms; Associate Professor W. Smith.

The major in animal breeding equips candidates for careers in animal genetics and breeding.

Degree candidates are expected to acquire training in genetics, animal breeding, and statistics. Additional courses may be required from other fields of biological and physical sciences. A typical program of study will include some of the following graduate-level courses: statistical and population genetics; poultry genetics; dairy cattle genetics; population genetics; animal breeding; statistics and experimental design; physiology; anatomy; and computer sciences.

Animal nutrition

L. H. Harbers, Chair

Professors Adams, Bolsen, Brent, Brethour, Deyoe, Frey, Harbers, Hines, Morrill, and Riley; Associate Professors Behnke, Harmon, Klopfenstein, Nagaraja, Nelssen, and Shirley; Assistant Professors Brandt, Cochran, and Hancock.

Course work for candidates specializing in animal nutrition will include graduate-level work in areas such as nutrition, biochemistry, physiology, microbiology, statistics, computer science, grain science, and others necessary to meet the specific needs of individual candidates.

Animal production and management

R. H. Hines, Chair

Professors Adams, Bolsen, Corah, Craig, Dikeman, Hines, Kiracofe, Morrill, Riley, and Schalles; Associate Professor Nelssen and Shirley; Assistant Professor Raub.

Graduate programs in this area qualify candidates for careers in research, teaching, or extension. Major emphasis is on development of expertise necessary for decision making in modern animal industries.

Minimum undergraduate preparation for the program is: two courses in chemistry; two courses in mathematics or computer science; two courses in biological science; three courses in economics and/or business administration; and two courses in animal production and management.

Candidates will acquire proficiency in statistics and in two of the following areas: animal nutrition, animal breeding, animal physiology, and animal products.

Courses to complete the program of study may be selected from the following suggested areas (departments) in accord with the interests of the student and upon approval of the student's supervisory committee: animal sciences, agricultural

engineering, agronomy, biology, business administration, communications, mathematics, computer sciences, economics, education, food sciences, and grain science.

Animal products

Donald Kropf, Chair

Professors Cunningham, Dikeman, Fung, Hunt, Kastner, and Kropf; Associate Professor Jeon; Assistant Professors Smith and Unruh.

The faculty offers a specialization in meat, dairy, and poultry products as related to their production. Course work will be required to meet the specific needs of students as determined by supervisory committees.

Animal reproduction

G. H. Kiracofe, Chair

Professors Corah, Craig, and Kiracofe; Associate Professors Davis, Blecha, Minton, Spire, and Stevenson; Assistant Professor Raub.

Degrees equip students for vocations in animal reproduction and related facets of animal physiology. Study will be in reproductive endocrinology, fertilization, the establishment of pregnancy, environmental effects on reproduction, reproductive behavior and related physiology, milk secretion, and applied reproductive physiology.

Degree candidates will receive supportive training in physiology, biochemistry, and statistics. Specific course work may be determined by the supervisory committee to meet the specific needs of individual candidates.

Animal sciences

Jack G. Riley, Chair

The interdepartmental graduate program in animal sciences is offered by faculty members in the Departments of Animal Sciences and Industry, Statistics, Anatomy and Physiology, Grain Science and Industry, and Surgery and Medicine.

Candidates for the master of science or doctor of philosophy degrees in animal sciences may specialize in animal breeding, animal nutrition, animal production and management, animal reproduction, or animal products. The following general requirements will be adhered to:

1. The chair of the student's supervisory committee will be a member of the animal sciences subdivision in which the student wishes to specialize.
2. The student's undergraduate background will include adequate basic courses in animal agriculture and biological and physical sciences. Students may be required to complete additional undergraduate courses in preparation for graduate study

when the student's supervisory committee believes it is necessary.

3. The student's supervisory committee will be responsible for development of a program of study which meets any specific requirements established for the subdivision in which the student specializes.

4. The chair of the supervisory committee will direct and advise the student in planning and executing research.

5. There is no foreign language requirement.

6. All requirements of the Graduate School must be met.

Facilities for both basic and applied research include large and small experimental animals, modern laboratories, pilot plants for dairy, poultry, and meat products, and adequate library resources.

Students desiring to specialize in any subdivision should consult the appropriate chair for that area.

Biochemistry

C. Hedgcoth, Chair

Professors Clarenburg, L. Davis, Denell, Hedgcoth, K. Kramer, Oehme, Reeck, Roche, Roufa, Seib, and L. Takemoto; Associate Professors Marchin, Mueller, Muthukrishnan, D. Rintoul, and D. Takemoto; Assistant Professors Krishnamoorthi, Ochs, and Welti.

The graduate biochemistry group has the responsibility for the graduate biochemistry program leading to the M.S. and Ph.D. degrees and is directly responsible to the dean of the Graduate School. The graduate biochemistry group consists of biochemists, regardless of department or college affiliation, who are approved for membership in the graduate biochemistry faculty. An executive committee composed of three members of the graduate biochemistry group and elected by the group serves an administrative function. One member of the executive committee serves as chairman of the group. Units of the University currently cooperating in the program are biochemistry, physiological sciences, grain science and industry, surgery and medicine, and the Division of Biology.

Entering graduate students must meet the entrance requirements of the Graduate School and must have completed one year of organic chemistry; differential and integral calculus; one semester of analytical chemistry; and a course in biology, including a laboratory. It is preferred that students entering the program have a year of physical chemistry but this requirement may be satisfied by including the year of physical chemistry as a part of the graduate program.

Center for Aging

George R. Peters, Director

Edith L. Stunkel, Assistant Director

The Center for Aging coordinates gerontology education, research, and service across six colleges: agriculture, architecture and design, arts and sciences, business administration, education, and human ecology. In addition, faculty and staff from the Division of Cooperative Extension, Division of Continuing Education, and the University for Man participate on the three center committees of education, research, and outreach. The education committee oversees the graduate emphasis in gerontology program and the undergraduate secondary major in gerontology.

Gerontology

The graduate emphasis in gerontology program provides students the opportunity to integrate knowledge received in their major professional disciplines with a program of academic study and field experience in gerontology. It is designed to be taken concurrently with, or in addition to, a disciplinary graduate degree program at either the master's or doctorate level. The total program requires 14 to 18 credit hours, some of which may overlap with degree requirements for the student's disciplinary degree. Specific requirements include:

One upper-level graduate gerontology course (700 or above) in the student's own discipline (3 credit hours).

Two graduate-level gerontology courses (500 or above) in disciplines other than the student's own (6 credit hours).

Practicum-colloquium in a gerontological setting (3 credit hours).

Gerontological focus integrated into a master's project, thesis, report, oral examination, or Ph.D. dissertation (2 to 6 credit hours).

Departmental course electives

Graduate courses currently offered at KSU included in this emphasis program are:

College of Agriculture

Horticulture

HORT 525 Horticulture for Special Populations

College of Architecture and Design

Architecture

ARCH 730 Environment and Aging

Regional and community planning

PLAN 761 Community Development Workshop (var.)

College of Arts and Sciences

DAS 515 Long-Term Care Administration Internship

English

ENGL 535 Literature of Aging

History

HIST 520 Death and Dying in History

Physical education and leisure studies

- LS 501 Therapeutic Processes in Rehabilitation Agencies*
 LS 862 Leisure Counseling
 PE 796 Physical Activity and the Older Adult: Psychological Perspectives

Psychology

- PSYCH 520 Life Span Personality Development
 PSYCH 715 The Psychology of Aging

Social work

- SOCWK 566 Social Work in Aging Services
 SOCWK 610C Topics in Long-Term Care Administration

Sociology

- SOCIO 744 Social Gerontology: An Introduction to the Sociology of Aging
 SOCIO 944 Seminar in the Sociology of Aging

Speech

- SPPAT 605 Communication Disorders and Aging
 THTRE 665 Theatre for Special Populations

College of Education**Administration and foundations**

- EDAF 862 Leisure Counseling

Adult and occupational education

- EDAO 780 Educational Gerontology

College of Human Ecology

- DHE 515 Long-Term Care Administration Internship

Clothing, textiles, and interior design

- ID 751 Designing for Exceptional Needs

Human development and family studies

- HDFS 510 Human Development and Aging
 HDFS 654 Death and the Family
 HDFS 845 Adult Development and Aging
 HDFS 704 Seminar in Human Development and Family Studies (var.)
 HDFS 770 Economics of Aging

Foods and nutrition

- FN 718 Physical Health and Aging
 FN 817 Nutrition and the Aging

*Project approval from Center for Aging needed.

Center for Aging programs

The Center for Aging also offers a range of educational services, including a newsletter, small gerontological library, seminar series, undergraduate assistantships, and programs for older adults. Inquiries about curricula or other programs should be directed to the Center for Aging, 1 Fairchild Hall, Manhattan, Kansas 66506-1102, (913) 532-5945.

Engineering

Albert N. Lin, Chair

Professors Akins, Appl, Azer, Ball, Best, Bissey, Burton,¹ Carpenter, Chung, Clark, Cogley, Cooper, Dahl, Donnert, S. A. Dyer, Eckhoff, Erickson, Fan, Faw, Gallagher, Glasgow, Gorton, Gowdy, D. L. Grosh, Harnett,¹ Hodges, Hu, Huang, Hummels, Hwang, Johnson, Jones, Kipp, Kirmser, Koelliker, Konz, Kyle, Lee, Lenhart, Lucas, Manges,¹ Mathews, Matthews, Merklin,¹ Miller,¹ Mingle, Rathbone, Russell, Shultis, Simons, Smith, Snell, Spillman, Steichen, Swartz, Thompson, Tillman, Turnquist, Walawender,¹ Walker, and Williams; Associate Professors Beck, Chang, Devore, R. A. Dyer, Eggeman, Fenton, Fowler, L. E. Grosh, Harms, Harner, Hayter, Heber, Knostman,

Kuhlman, Lin,¹ Pahwa, Rys, Schlup, Schrock, Slocombe, and Swenson; Assistant Professors Chandra,¹ Cottom, Krishnaswami, McCright, Morcos, and White.

¹Members of College of Engineering graduate committee

The graduate committee of the College of Engineering coordinates the graduate program leading to the Ph.D. in engineering. The committee consists of a representative from each academic department of the college, with the exception of engineering technology, which offers the B.S. degree only. The primary function of the committee is to administer the graduate program policies established by the College of Engineering graduate faculty and the Graduate School.

Within the doctoral program leading to the Ph.D. in engineering, the traditional areas of engineering are represented by the Departments of Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical and Computer Engineering, Industrial Engineering, Mechanical Engineering, and Nuclear Engineering, with emphases in systems engineering, materials science, energy processes, bioenvironmental engineering, and information processing.

Entering graduate students must meet the entrance requirements of the Graduate School and must have completed the B.S. degree in a field of engineering or a closely related area of science.

Food science

J. M. Faubion, Chair

Professors D. Allen, Bowers, Brent, Chung, F. Cunningham, Deyoe, Dikeman, L. Erickson, D. Eustace, Fan, B. Fryer, O. Fung, D. Fung, L. Harbers, Hosene, Hunt, Iandolo, Kastner, Kropf, Kyle, Mugler, P. Nordin, Paulsen, Ponte, Reeck, Seib, Setser, Spears, C. Walker, and Zayas; Associate Professors Canter, J. Faubion, K. Grunewald, Jeon, C. Harbers, C. Klopfenstein, J. Pederson, E. Posner, Roach, M. Smith; Assistant Professor E. Chambers.

Graduate work leading to the degrees M.S. and Ph.D. in food science is offered in the Departments of Agricultural Economics; Agricultural Engineering; Agronomy; Animal Sciences and Industry; Biochemistry; Chemical Engineering; Dietetics, Restaurant and Institutional Management; Grain Science and Industry; Foods and Nutrition; Horticulture; and the Division of Biology.

Requirements for entering graduate study in food science are: (1) mathematics, including college algebra; (2) analytical and organic chemistry; (3) a course in physics; (4) an introductory course in microbiology;

and (5) a course in botany, zoology, or biology. When the student's committee believes it necessary, the student will be required to take additional undergraduate courses to prepare more completely for the individual program.

Candidates for degrees are expected to select courses that provide adequate coverage in several food areas, with primary emphasis in one or more areas.

The M.S./Ph.D. program of study shall be expected to include courses in biochemistry, statistics, food microbiology, food chemistry, and food processing/food engineering. No more than 6 credit hours at the 500 level will be accepted. One credit of Food Science Colloquium (FN 981) for the M.S. degree and 2 credits of Food Science Colloquium for the Ph.D. degree shall be included. There is no foreign language requirement.

Course requirements will be evaluated by the student's supervisory committee, which will include at least one member of the food science coordinating committee. The chairman of the coordinating committee must approve members of the student's advisory committee and the program of study.

Facilities are available for a comprehensive range of teaching and research activities including pilot plants for milling, baking, dairy products, poultry products, meats, and quantity food production. Laboratories are equipped for research involving food processing, sensory evaluation of food, biochemistry, heat transfer, fluid flow, filtration, evaporation, microbiology, rheology, freeze drying, and nutrition.

Graduate students may select courses from the following lists. See your advisor for details.

Agricultural Engineering

- AGE 650 Agricultural Systems Engineering
 AGE 700 Agricultural Process Engineering

Animal Sciences and Industry

- ASI 502 Principles of Dairy Foods Processing
 ASI 550 Dairy Bacteriology
 ASI 606 Instrumental Analysis of Food and Agricultural Products
 ASI 635 Poultry Meat Technology
 ASI 630 Egg Science
 ASI 671 Meat Selection and Utilization
 ASI 694 Food Plant Management
 ASI 695 Quality Assurance of Food Products
 ASI 711 Food Fermentation
 ASI 713 Rapid Methods and Automation in Microbiology
 ASI 715 Chemistry of Foods
 ASI 725 Meat Packing Plant Operation
 ASI 777 Meat Technology
 ASI 818 Fundamentals of Meat Processing and Preparation
 ASI 850 Analytical Techniques in Animal Sciences and Industry
 ASI 930 Advanced Meat Science

Biochemistry

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| BIOCH 655 | Biochemistry I |
| BIOCH 656 | Biochemistry I Laboratory |
| BIOCH 670 | Principles of Animal Nutrition |
| BIOCH 790 | Physical Biochemistry |
| BIOCH 830 | Animal Nutrition Techniques |
| BIOCH 840 | Intermediary Metabolism |
| BIOCH 910 | Lipids |
| BIOCH 930 | Proteins |
| BIOCH 940 | Chemistry of Carbohydrates |
| BIOCH 950 | Enzyme Chemistry |
| BIOCH 960 | Advanced Animal Nutrition |

Biology

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| BIOL 520 | Microbiology of Foods |
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Chemical Engineering

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| CHE 530 | Transport Phenomena |
| CHE 550 | Chemical Reaction Engineering |
| CHE 715 | Biochemical Engineering |
| CHE 725 | Biotransport Phenomena |
| CHE 805 | Selected Topics in Biochemical Engineering |

Engineering Technology

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| ET 640 | Food Processing Operations |
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Foods and Nutrition

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| FN 501 | Food Science |
| FN 502 | Principles of Nutrition |
| FN 610 | Nutrition Throughout the Life Cycle |
| FN 612 | Principles of Food Product Development and Control |
| FN 630 | Clinical Nutrition |
| FN 700 | Community Nutrition |
| FN 702 | Nutrition in Developing Countries |
| FN 721 | Sensory Analysis of Foods |
| FN 750 | Nutritional Aspects of Food Processing and Preparation |
| FN 760 | Fundamentals of Food Flavor Analysis |
| FN 790 | Food Research Techniques |
| FN 816 | Application of Food Flavor Analysis |
| FN 817 | Nutrition and Aging |
| FN 710 | Bionutrition |
| FN 720 | Food Systems |
| FN 906 | Proteins in Food Systems |
| FN 907 | Food Dispersions |
| FN 908 | Carbohydrates in Food Systems |
| FN 910 | Advanced Nutrition: Carbohydrates and Lipids |
| FN 911 | Advanced Nutrition: Proteins and Amino Acids |
| FN 912 | Advanced Nutrition: Minerals |
| FN 913 | Advanced Nutrition: Vitamins |
| FN 981 | Food Science Colloquium |

Grain Science and Industry

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| GRSC 500 | Milling Technology I |
| GRSC 602 | Cereal Science |
| GRSC 625 | Flour and Dough Testing |
| GRSC 634 | Bakery Technology |
| GRSC 635 | Baking Science I |
| GRSC 651 | Food and Feed Plant Sanitation |
| GRSC 661 | Qualities of Feed and Food Ingredients |
| GRSC 710 | Fundamentals of Grain Storage |
| GRSC 711 | Principles of Food Analysis |
| GRSC 715 | Fundamentals of Processing Grains for Food |
| GRSC 730 | Milling Technology II |
| GRSC 737 | Baking Science II |
| GRSC 801 | Enzyme Applications |
| GRSC 810 | Advanced Cereal Chemistry |

Horticulture

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| HORT 700 | Vegetable Crop Physiology |
| HORT 792 | Handling and Processing Fruits and Vegetables |

Hotel, Restaurant, Institution Management and Dietetics

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| HRIMD 635 | Foodservice Equipment and Layout |
| HRIMD 805 | Food Production Management |
| HRIMD 890 | Foodservice Administration |

Genetics

G. H. Liang, Chair

Professors Barnett, Brent, Clayberg,¹ Craig,¹ Davis,¹ Denell, Gill,¹ Hatchett, Liang,¹ Manney,¹ Nassar,¹ Reeck, Schalles, Sears, and Wassom; Associate Professors Browder, Muthukrishnan, Schapaugh, and Tomb; Assistant Professors Black, Eversmeyer, Heaton, Hulbert, Leslie, White, and Williams.

¹Members of the genetics coordinating committee

Graduate work leading to the M.S. and Ph.D. degrees in genetics is administered through an interdepartmental program. The program is supervised by a genetics coordinating committee of faculty from participating departments that sets the academic requirements for degrees and assigns one or more of its members to the supervisory committee of each student. A graduate student is associated with the department to which the major professor belongs, but the graduate degree is awarded in genetics.

In addition to the general entrance requirements set up by the Graduate School, students in genetics should have two courses of inorganic chemistry, one course of organic chemistry, an introductory course in genetics, and 6 additional hours of biological sciences. Students who do not meet these requirements may make up these deficiencies either by examination or by enrolling in the necessary courses during the first year of graduate study. Although the program of study is determined by each student's supervisory committee, the genetics coordinating committee has outlined certain specific requirements. Depending on the area of specialization, a student should fulfill the minimum course requirements in either of the following broad categories:

Genetics Option 1**Master's degree**

A statistics course (700 level)
A course in molecular biology or molecular genetics
Two additional genetics courses from those listed below
A minimum of 1 hour of graduate-level seminar

Ph.D. degree

A statistics course (700 level)
A course in molecular biology or molecular genetics
A biochemistry course (500 level or above)
Four additional genetics courses from those listed below
A minimum of 3 hours of graduate-level seminar

Genetics Option 2**Master's degree**

A statistics course (500 level or above)
A course in classical genetics or breeding (crops and animals)
Two additional genetics courses from those listed below
A minimum of 1 hour of graduate-level seminar

Ph.D. degree

A statistics course (500 level or above)
A course in classical genetics or breeding (crops and animals)
A biochemistry course (700 level)
Four additional genetics courses from those listed below
A minimum of 3 hours of graduate-level seminar

Selected genetics courses**Agronomy**

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| AGRON 770 | Plant Genetics |
| AGRON 860 | Applied Plant Breeding |
| AGRON 830 | Quantitative Genetics in Relation to Plant Breeding |
| AGRON 910 | Topics of Plant Breeding |
| AGRON 940 | Genetic Manipulation of Crop Plants |
| AGRON 970 | Advanced Plant Breeding |

Animal sciences and industry

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|---------|------------------------------|
| ASI 655 | Behavior of Domestic Animals |
| ASI 749 | Advanced Animal Breeding |

Biochemistry

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| BIOCH 521 | General Biochemistry |
| BIOCH 522 | General Biochemistry Lab |
| BIOCH 755 | Biochemistry I |
| BIOCH 765 | Biochemistry II |

Biology

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| BIOL 540 | Molecular Biology |
| BIOL 615 | Cytogenetics |
| BIOL 651 | Molecular and General Genetics |
| BIOL 675 | Genetics of Microorganisms |
| BIOL 750 | Molecular and Cellular Biology |
| BIOL 858 | Regulation of Gene Expression |

Entomology

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| ENTOM 845 | Insect Control by Host Plant Resistance |
| ENTOM 910 | Insect Genetics |

Horticulture

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| HORT 740 | Horticultural Plant Breeding |
| HORT 910 | Topics in Plant Breeding |
| HORT 930 | Topics in Plant Genetics |

Plant pathology

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| PLPTH 711 | Plant Tissue Culture and Regeneration |
| PLPTH 735 | Plant Virology |
| PLPTH 740 | Plant Bacteriology |
| PLPTH 815 | Advanced Techniques in Plant Cytogenetics |
| PLPTH 860 | Host Plant Resistance to Diseases |
| PLPTH 927 | Fungal Genetics |

Statistics

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| STAT 950 | Statistical Genetics (taught on demand) |
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Descriptions of these courses can be found in the departmental sections of this catalog.

The participating departments are agronomy, animal sciences and industry, biochemistry, horticulture, physics, plant pathology, statistics, and the Division of Biology.

No foreign language is required; however, if the supervisory committee believes a reading knowledge of foreign languages is essential to a particular research problem, it may be required.

Human ecology

Elizabeth A. McCullough, Chair

Professors Bollman, Jurich, McCullough, Murray, Reagan, Russell, Setser, and Spears; Associate Professors Bergen, Canter, Gregoire, Murray, Peterson, Poresky, Roach, Scheidt, Schumm, Wanska, and White; Assistant Professors Balk, Barnes, Huck, Miller, Munson, and Wright.

The Ph.D. program in human ecology presents the opportunity for specialized study in one of five areas. Interdisciplinary studies within a specialization may be developed in the College of Human Ecology, and with other supporting disciplines at Kansas State University. The

Ph.D. program is offered by the graduate faculty members of the Departments of Clothing, Textiles, and Interior Design; Hotel, Restaurant, Institution Management and Dietetics; and Human Development and Family Studies. A separate Ph.D. program is offered by the Department of Foods and Nutrition. Each student must identify an approved specialization when applying.

The following specializations are offered:

Family life education and consultation

The family life education and consultation specialization prepares candidates to conduct, administer, and evaluate programs for enhancing the quality of family life. This specialization requires course work in human development, family studies, family life education, research methods, evaluation, and applied practice in family and community service organizations. Graduates are qualified for positions in colleges and universities, cooperative extension, human service agencies, and similar professions.

Institution management

The institution management specialization focuses on the systems approach for providing quality food and service at a reasonable cost. Graduates are prepared with a knowledge base and skills to assume leadership roles in foodservice and hospital-ity management education, research, and practice.

Life span human development

The life span human development specialization emphasizes the growth and development of the individual over the course of a lifetime, the varying contexts of human development, and the processes underlying development throughout the life cycle. The program encompasses theory and research in child and adolescent development, adult development, gerontology, family studies, and thanatology. Graduates may prepare for careers in research, applied human services, or academic positions.

Marriage and family therapy

The marriage and family therapy specialization prepares professionals to conduct and critically evaluate therapy with marital and family groups. Students pursue a program of study that includes human development, family studies, marital and family therapy, statistics, and research methods. The doctoral program in marriage and family therapy is accredited by the Commission on Accreditation for Marriage and Family Therapy Education.

Textiles and apparel

The textiles and apparel specialization focuses on the historic, sociopsychological, economic, chemical, or functional design aspects of textiles and apparel. Research problems are approached from a systems perspective incorporating human and environmental factors. The specialization prepares students for positions in higher education, business, industry, extension, museums, and/or government.

Programs of study

Each student, with the guidance of an advisor and a graduate committee, prepares an individualized program of study to meet the student's goals, as well as program requirements. Programs of study include a minimum of 90 credit hours beyond the bachelor's degree, with at least 30 hours course work in the major area, 30 hours in dissertation research, and the remainder in supporting courses. Inquiries should be directed to: Chair, Ph.D. Coordinating Committee, 119 Justin Hall, College of Human Ecology, Kansas State University, Manhattan, Kansas 66506-1401.

International trade studies

Ali Fatemi, Committee Chair

Professors Bussing, Deyoe, Fatemi, Frey, Goodwin, Gormely, Hadja, and Murray.

International trade has grown more rapidly since World War II than the world's output of goods and services. As a result, the world's economy has become increasingly internationalized. Foreign trade has become progressively important both for U.S. industry and agriculture.

Kansas State University's mission as a land-grant university is irrevocably linked to this internationalization and its impact on economic, political, and social processes. Recognizing that the whole character of the modern world is influenced by past and present international trade, the University provides students with the opportunity to broaden their knowledge and understanding in this important area. KSU offers a full range of academic programs reflecting the notion that international trade exchanges goods, capital, and services and fosters the transmission of ideas about technological advance and scientific achievement, standard of living and ways of life, and political, diplomatic, and economic arrangements. Several departments focus on developing appropriate skills and interests at the graduate level. Students desiring to develop a proficiency in international trade can choose from the following master's programs:

Agricultural economics

The master of science in agricultural economics offers students opportunities for careers in international trade. Students interested in such careers may include in their programs of study trade-related elective courses in agricultural economics, economics, and other departments. The courses listed below are suggested for consideration.

Business administration

The master of business administration (M.B.A.) degree offers students strong preparation for careers in international trade and international business management. Most courses in the M.B.A. program are carefully structured to contain the worldwide dimension required by the AACSB accreditation standards. Additionally, students are allowed to choose international trade as their area of concentration in the M.B.A. program. The program consists of 33 hours, 24 hours of which are specified. The other 9 hours can be taken from courses which relate to the student's area of concentration. Those concentrating in international trade can take ECON 823, Advanced International Economics; FINAN 820, Advanced International Financial Management; ECON 681, International Trade; MKTG 844, Advanced International Marketing; and MGMT 690, International Management.

Economics

The master of arts in economics offers students opportunities for careers in international trade. Students interested in such careers may include in their programs of study trade-related elective courses in agricultural economics, economics, and other departments. The courses listed below are suggested for consideration.

Geography

The master of arts in geography offers students an opportunity to prepare for a career in international trade. Students must complete all requirements for the M.A. degree as set forth in the geography section of this catalog. The following courses are required: GEOG 740, Geography of Transportation; a 600-level regional geography course; and a minimum of 6 hours of trade-related courses from outside the department from those listed below.

Grain science

The master of science in grain science may prepare students for a career in international trade. Required departmental courses give students a background in grain quality and processing. In addition students should take AGEC 623, Export Marketing and Agricultural and Food Products, and additional hours from the following list that are directly related to international trade.

Political science

The master of arts in political science and the master in public administration degrees prepare students for careers in international trade. Students working on the M.A. degree should take the required courses in political science. In addition, they may take a minimum of 6 hours from trade-related courses outside the department, such as ECON 681, International Trade, and ECON 823, Advanced International Economics. Students in the M.P.A. program may focus on international trade by taking a minimum of 12 hours from among illustrative courses listed below.

Sociology

The master of arts in sociology may prepare a student for a career in international trade when based upon undergraduate work in basic economics, sociology, and other social sciences. In addition to those required for a master's degree, courses may be selected from those listed below.

Selected courses dealing with international trade:

| | |
|-----------|--|
| AGEC 615 | International Agricultural Development |
| AGEC 623 | Export Marketing of Agricultural and Food Products |
| AGEC 631 | Principles of Transportation |
| AGEC 710 | Quantitative Methods in Agricultural Marketing Firms |
| AGEC 840 | Marketing Strategies and Policies in International Grain Markets |
| ANTH 511 | Cultural Ecology and Economy |
| ECON 681 | International Trade |
| ECON 823 | Advanced International Economics |
| FINAN 554 | International Financial Management |
| FINAN 820 | Advanced International Financial Management |
| GEOG 740 | Geography of Transportation |
| MANGT 690 | International Management |
| MKTG 544 | International Marketing |
| MKTG 844 | Advanced International Marketing |
| POLSC 541 | International Relations |
| POLSC 543 | American Foreign Policy |
| POLSC 647 | International Law |
| SOCIO 951 | Social and Institutional Dynamics |

A minimum of 12 hours of study of a modern language is recommended.

South Asian Studies

Aruna Michie, Director

South Asian studies focus on the geographic, linguistic, and cultural regions of Afghanistan, Bangladesh, Pakistan, India, Nepal, Sri Lanka, Bhutan, and the Maldivian Republic.

Specialization in South Asian studies is possible at the master's level in history, political science, and sociology, and in selected instances, for Ph.D. students in history and sociology.

For more information contact the South Asia Center, 22 Eisenhower Hall, Manhattan, Kansas 66506, (913) 532-5738.

Veterinary pathology and laboratory medicine

B. W. Fenwick, Chair

Professors Anderson, Bailie, Coffman, Cook, Dennis, Keeton, Kennedy, Kruckenberg, Leipold, Leland, Lorenz, Minocha, Moore, Mosier, Oehme, Phillips, Smith, Straffuss, and Vestweber; Associate Professors Blecha, Fenwick, Ridley, and Schoning; Assistant Professors Hall, McVey, and Troyer.

Graduate programs are offered by the Departments of Pathology, Laboratory Medicine, Surgery and Medicine, and Veterinary Diagnosis in the College of Veterinary Medicine leading to the degree(s) of master of science and doctor of philosophy.

Areas of study include veterinary microbiology, virology, parasitology, public health, toxicology, and clinical and anatomic pathology. Requirements for entering graduate study in pathology and clinical pathology are completion of the degree of doctor of veterinary medicine or equivalent and/or approval of the executive committee of the pathology group and the dean of the Graduate School.

Agriculture

Walter Woods, Dean and Director of the Kansas Agricultural Experiment Station and the Kansas Cooperative Extension Service

114 Waters Hall
532-7137

David J. Mugler, Associate Dean and Director of Resident Instruction
Lawrence H. Erpelding, Associate Director
John B. Riley, Assistant Director

117 Waters Hall
532-6151

The College of Agriculture offers one associate of agriculture degree, 14 bachelor of science degree programs, 10 master of science programs, and nine programs leading to the Ph.D. In addition there are pre-forestry and pre-veterinary medicine programs. Some of the B.S. programs have four options, such as business and industry, production, science, and communications. Other curricula such as milling science and management and food science and industry offer three options. The many programs and options provide flexibility to meet the needs of students who will be entering the many careers in the food chain and related agribusinesses. All programs are designed to bring about changes in students in the following areas:

Objectives

Knowledge and understanding

Help students to master one or more important areas of scientific agriculture, and to gain knowledge and understanding of supporting academic areas, so they will be able to understand and assimilate new technological developments and apply new knowledge to problem solving.

Skills

Help students to develop appropriate skills and abilities to perform tasks efficiently and expertly in various areas of professional agriculture.

Professional attitudes and orientation

Help students to identify with and understand the ethics and goals of professional agriculture and to continue learning throughout their lives.

Personal and leadership development

Develop in students an appreciation of present-day civilization; demonstrate that an understanding of many subjects is required to solve problems; help students develop and understand a philosophy of life and values; and help students develop their abilities to work with others.

The profession

Professional agriculture is the application of the physical, biological, and social sciences and the principles of management to food production, food preservation and processing, crop and livestock marketing, culture of flowers and ornamentals, life processes of plants and animals, natural resources management, economic development, and related fields.

Faculty

More than 95 percent of the instructional faculty of the College of Agriculture have Ph.D. degrees. All are actively involved in research and publish their findings regularly in scientific journals. They work closely with extension specialists. This integration of teaching, research, and extension helps insure that courses are current and relevant.

Facilities

Effective instruction in the application of basic sciences to modern agricultural industries requires land, buildings, livestock, and equipment. More than 4,000 acres of land are used for experimental work and for instruction.

A feed mill, flour mill, and bakery include modern equipment from eight countries. Well-equipped drafting rooms are used by milling students. Greenhouses and field plots provide plants for horticulture courses.

Modern animal industry and dairy and poultry buildings contain some of the latest equipment for teaching and research in nutrition, genetics, and food processing (meat, milk, eggs). Livestock of many breeds, plus various soil types, field crops, fruits, vegetables, and ornamentals are used in teaching and research.

Professional programs in agriculture

Agribusiness—B.S.
Agricultural economics—B.S., M.S., Ph.D.
Agricultural education (teaching)—B.S.
Agricultural journalism—B.S.
Agricultural mechanization—B.S., M.S.
Agronomy (crops and soils)—B.S., M.S., Ph.D.
Animal sciences and industry—B.S., M.S., Ph.D.
Bakery science and management—B.S.
Crop protection—B.S.
Entomology—M.S., Ph.D.
Feed science and management—B.S.
Food science—M.S., Ph.D.
Food science and industry—B.S.
Genetics—M.S., Ph.D.
Grain science—M.S., Ph.D.
Horticultural therapy—B.S.
Horticulture—B.S., M.S., Ph.D.

Milling science and management—B.S.
Park resource management—B.S.
Plant pathology—M.S., Ph.D.
Pre-forestry—two years
Pre-veterinary medicine—three years
Retail floriculture—two years, associate of agriculture degree

General Requirements

Selection of a major

Students usually select a curriculum or major at the time they enter the college. They are provided academic advisors in their major fields. Students enroll in general agriculture if they want to enter some part of professional agriculture but are not yet ready to identify a particular major. They are assigned an academic advisor in the resident instruction office or an advisor in one of the academic departments. These students are urged to choose majors before the close of the freshman year.

The curriculum or major may be changed at almost any time and with relative ease, though a change after the sophomore year may delay graduation.

Electives permit adaptation of the program to the student's goals. The student should work with an advisor to develop the most beneficial and effective academic program.

Many students work part time in KSU laboratories, and greenhouses, and on the farms. This experience adds greatly to students' learning and understanding.

Selection of an option

Most major fields of study in agriculture provide for selection of groups of courses known as options. Some typical options include:

Business and industries

A business and industries option prepares students to enter off-farm agribusiness. Many students should take courses to prepare them to compete in industry. Suggested course areas include accounting, labor relations, corporation law, sales psychology, and journalism.

Production

A production option is for students who plan to go into farming or ranching. Those who plan to enter these areas should consider their future community responsibilities and the changing characteristics of farming as they select their courses. Farmers need to understand state and local government, principles of taxation, and

corporation law as applied to farms, in addition to the technology of crop and livestock production.

Scholarly/professional

A science/professional option prepares students for research and graduate study. About 20 percent of recent graduates are in graduate school, aiming for M.S. or Ph.D. degrees. Graduate students will do best if their undergraduate programs were strong in the basic sciences (mathematics, botany, biology, physics, chemistry, statistics, computer science, and economics) and in communications.

Communication

A communication option provides students with some professional skills in journalism and mass communications. These courses give students an introduction to news writing and editing. Students may select more advanced communications courses according to interests and needs. Such additional skills and abilities will make students more effective in active citizenship roles and more proficient in their professions.

Additional options are available in certain curricula or majors to allow students to develop specific strengths or specializations.

Suggested humanities and social science electives (must be taken from more than one department):

College of Architecture and Design—any course in history or appreciation of architecture

Art—courses in appreciation and theory

Economics—above ECON 110, Economics I

English—any except courses in composition

Geography—any except GEOG 220, Environmental Geography I and GEOG 221, Environmental Geography II

History—any course

Human development and family studies—any course

Modern languages—any course

Music—any course in theory or appreciation of music

Philosophy—any course

Political science—any course

Psychology—any course

Sociology, anthropology, and social work—any course

Speech—any course in theater and interpretation

Suggested additional communications courses

| | | |
|-----------|--|---|
| GENAG 410 | Agricultural Student Magazine | 1 |
| ENGL 200 | Intermediate Composition | 3 |
| ENGL 516 | Written Communications for the Sciences | 3 |
| SPCH 311 | Business and Professional Speaking | 3 |
| SPCH 321 | Public Speaking II | 2 |
| SPCH 325 | Argumentation and Debate | 3 |
| SPCH 726 | Seminar in Persuasion | 3 |
| JMC 275 | News and Feature Writing | 3 |
| RTV 240 | Audio I | 3 |
| RTV 250 | Video I | 3 |
| MKTG 442 | Sales Communications | 3 |
| EDAO 706 | Principles of Teaching Adults in Extension | 3 |

Program Choices

General agriculture

Students who are undecided regarding the selection of a major in agriculture may want to enroll in general agriculture. Courses taken in this area are selected with the help of an advisor to be applicable to any major in agriculture and to most other programs offered at the University. Examples of course selections for first semester follow:

Example I

| | | |
|-----------|--------------------------------|----|
| ENGL 100 | English Composition I | 3 |
| GENAG 101 | Ag Orientation | 1 |
| ASI 102 | Principles of Animal Science | 3 |
| MATH 100 | College Algebra | 3 |
| HORT 200 | Plant Science | 4 |
| PE 101 | Principles of Physical Fitness | 1 |
| | | 15 |

Example II

| | | |
|-----------|--------------------------------------|-------|
| AGEC 100 | Principles of Agricultural Economics | 3 |
| GENAG 101 | Ag Orientation | 1 |
| CHM 110 | General Chemistry | 5 |
| | or | |
| CHM 210 | Chemistry I | 4 |
| MATH 010 | Intermediate Algebra | 3 |
| GRSC 100 | Principles of Milling | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| | | 15-16 |

Example III

| | | |
|-----------|-----------------------------------|----|
| SPCH 105 | Public Speaking IA | 2 |
| GENAG 101 | Ag Orientation | 1 |
| ECON 110 | Economics I | 3 |
| EDAO 319 | Agricultural Education Colloquium | 2 |
| AGRON 220 | Crop Science | 4 |
| ASI 302 | Introduction to Food Science | 3 |
| | | 15 |

Various general education and agriculture courses can be substituted in the examples above, depending on the student's interest.

Natural resource management

Students interested in natural resource management can pursue programs in park resource management, range management, and soil and water conservation.

A bachelor of science degree in agriculture under the park resource management curriculum can be earned in the Department of Forestry.

Range management and soil and water conservation options are available through the Department of Agronomy.

These programs provide training for individuals interested in interpretation and application of ecological principles to environmental problems involving natural resources. Each program contains courses in the social sciences and humanities to help students become sensitive to the interactions between humans and their environmental surroundings. Courses in the physical and biological sciences help students understand and solve environmental problems, and courses in communications assist them in interpreting, conveying, and employing solutions.

Park resource management

The park resource management program prepares students for a wide range of positions working directly with the public and using natural resources for recreation. Positions include ranger, naturalist, recreation planner, park director, and other recreation resource specialists. For additional information, refer to the park resource management curriculum in the Department of Forestry.

Range management

Studies in range management prepare students for careers in ranch operation, consulting, industry, and service in governmental agencies such as the Soil Conservation Service, Forest Service, and Bureau of Land Management.

Courses in biological, physical, and animal sciences support the major courses in range science. For additional information, refer to the range management option in the Department of Agronomy.

Soil and water conservation

The soil and water conservation program prepares students for careers related to conservation of soil and water resources, environmental impact analysis, soil erosion, and land use. For additional information, refer to the soil and water conservation option in the Department of Agronomy.

Pre-veterinary medicine program

Students who satisfactorily complete the pre-veterinary medicine program and the first two years of the curriculum in veterinary medicine will be eligible for a bachelor of science degree in the College of Agriculture. Pre-veterinary medicine requirements may also be completed in the College of Arts and Sciences.

| | | |
|-----------|--------------------------------------|----|
| GENAG 101 | Ag Orientation | 1 |
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Laboratory | 2 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 455 | Microbiology (with lab) | 4 |
| BIOL 510 | Embryology | 3 |
| BIOL 511 | Embryology Laboratory | 1 |
| ASI 102 | Principles of Animal Science | 3 |
| ASI 104 | Poultry Science | 1 |
| ASI 103 | Dairy Science | 1 |
| ASI 105 | Animal Sciences and Industry | 1 |
| ASI 200 | Fundamentals of Nutrition | 3 |
| ASI 500 | Genetics | 3 |
| | Humanities and/or social science | 12 |

Dual degrees/dual majors

The agribusiness complex of industries (processing, preservation, distribution, and retailing of farm-produced food, and manufacture and sale of farm equipment, feeds, and agricultural chemicals) employs

a variety of professionally trained personnel. The type of education required varies with the nature of the work performed. A dual degree or a dual major may be appropriate, depending on the student's occupational objectives.

Dual degrees may be earned by a student who desires a B.S. degree in some discipline in agriculture along with a B.S. degree in some other college at KSU. To earn two B.S. degrees, the student must complete the requirements of each degree and a minimum of 150 semester hours.

Dual majors are completed by students who wish to complete two different programs of study in agriculture while earning a bachelor of science degree in agriculture. This approach would allow the student to select two majors to give greater depth and breadth to the educational program. The student is required to complete the requirements for both majors and would earn a bachelor of science degree in agriculture.

Secondary major in gerontology

Certain departmental courses have been approved for credit toward the secondary major in gerontology. A listing of the approved courses may be found in the Secondary Majors section of this catalog.

Agriculture honors program

Agriculture students with high academic records are invited into the honors program. It encourages students to recognize and respond to the challenges of scholarly inquiry into aspects of professional and scientific agriculture as well as to investigate some of the related social, political, economic, and international issues.

The honors program is a method of intensive self-directed study. The student wishing to enter the program should have fairly definite educational goals.

Objectives

Program objectives are to increase the scope of educational attainment by providing a program in greater breadth and depth; to provide special recognition for outstanding scholastic achievement; and to foster a sustained interest in advanced education and research.

Eligibility

Students who have attained a cumulative GPA of 3.5 or higher in 12 or more completed hours at Kansas State University will be invited to participate in the College of Agriculture Honors Program, typically at the end of their sophomore year. Community college transfers will be invited into the program following their first semester if they have met the GPA requirement.

The program provides honors students with greater curriculum flexibility, which encourages breadth and depth of study in one or more specific areas. It also exposes

honors students to various areas of interest in agriculture. Each student in the program has a committee of three faculty members who assist the student in developing a program of study and in planning for independent research activities.

Students seeking to enroll in the program will meet with the honors committee member from the department involved and, with an advisor, will develop an honors curriculum tailored to the student's particular goals. The student, with advice from the advisor, honors committee member, and other faculty member(s), will prepare a short proposal outlining the honors project. This proposal must be approved by the honors advisory committee of the College of Agriculture.

The honors advisory committee will review the proposals for possible scholarship funding priority. These honors project scholarships will be used exclusively for materials and supplies necessary for the completion of the student's honors project.

Students will enroll in the agriculture honors program (GENAG 000) each semester. Students will also enroll for up to 8 credits in a "special problems" course in the appropriate department to receive credit for the honors project. In the senior year, students will enroll in GENAG 515, Honors Seminar for the presentation of their projects.

Completion of the honor's project requires presentation of a summary of the project in an honors seminar and a report written in a style suitable for publication in a referred journal in an appropriate field.

Agricultural Economics

Marc A. Johnson, Head
Barry L. Flinchbaugh, Program Leader—
Extension
Arlo Biere, Undergraduate Program
Coordinator
Orlan Buller, Graduate Program
Coordinator

Professors Barnaby, Barton, Biere,*
Buller,* Erickson,* Fausett, Flinchbaugh,
Johnson,* L. Langemeier,* Maxon,
Norman,* Orazem,* Phillips,* Pretzer,
Riley,* Schlender, Schurle,* Sorenson,*
and Williams;* Associate Professors
Burton,* Darling, Grunewald,* Kiser, and
Tierney; Assistant Professors Ables-Alli-
son, Barkley, Carriker, DeLano, Diebel,
Duncan, Featherstone,* Goodwin,* Hugo,
Lea, M. Langemeier, Mintert, Neils,
Nelson, Schroeder,* Vandever, Worman,
and Young; Instructor Beech; Emeriti:
Professors Dunbar, Figurski, Hess,*
Kelley,* Knight,* Koudele,* Manuel,*

McCoy,* McReynolds, Parker, Pine,*
Schruben,* Sjo,* Sobering, Thomas, and
Walker.

Undergraduate study

Bachelor of science in agribusiness—
127 semester hours

Bachelor of science in agriculture—
127 semester hours

Agribusiness

Agribusiness is the study of the economics and management of agribusiness firms with attention given to the aspects unique to agribusiness. Some of those aspects are the risks and uncertainties of agricultural production, the heavy reliance on natural resources, the uniqueness of the institutions that govern food and agriculture, the competitive structures within the agribusiness sector, the technology of commercial agriculture and food processing, and the international dimensions of food and agriculture. The agribusiness curriculum emphasizes agribusiness courses in agricultural economics and foundation courses in business administration.

Suggested schedule for first two years:

| First Semester | | |
|----------------|---|--------------|
| ENGL 100 | English Composition I | 3 |
| MATH 100 | College Algebra | 3 |
| AGEC 100 | Agricultural Economics and Agribusiness | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| | Agricultural science elective* | 3-4 |
| | | 15-16 |

Second Semester

| | | |
|----------|-----------------------------|-----------|
| ENGL 120 | English Composition II | 3 |
| MATH 205 | Calculus and Linear Algebra | 3 |
| ECON 110 | Economics I | 3 |
| CHM 110 | General Chemistry | 5 |
| SPCH 105 | Public Speaking IA | 2 |
| | | 16 |

Third Semester

| | | |
|-----------|---|-----------|
| AGEC 490 | Computer Applications in Agricultural Economics | 3 |
| POLSC 110 | Introduction to Political Science | |
| | or | |
| POLSC 325 | United States Politics | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| BIOL 198 | Principles of Biology | 4 |
| | Humanities elective** | 3 |
| | Communications elective | 3 |
| ENGL 200 | Intermediate Composition | |
| ENGL 516 | Written Communications for the Sciences | |
| SPCH 321 | Public Speaking II | |
| SPCH 325 | Argumentation and Debate | |
| | English course numbered 250 or above | |
| | | 17 |

Fourth Semester

| | | |
|-----------|--------------------------------|--------------|
| AGEC 500 | Production Economics | 3 |
| PSYCH 110 | General Psychology | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| | Agricultural science elective* | 3-4 |
| | Humanities electives** | 3 |
| | | 15-16 |

*Select from the agricultural and food science electives below.

**Approved humanities electives are any course in history, English literature, and philosophy and any non-performance course in theatre and music.

Agricultural and food science electives

| | | |
|-----------|---|---|
| AGRON 220 | Crop Science | |
| | or | |
| HORT 200 | Plant Science | 4 |
| AGRON 305 | Soils | 4 |
| AGRON 330 | Weed Management | 3 |
| ATM 300 | Engineering in Agriculture | 4 |
| ASI 102 | Principles of Animal Science | 3 |
| | and | |
| ASI 103 | Dairy Science | |
| | or | |
| ASI 104 | Poultry Science | |
| | or | |
| ASI 105 | Animal Science and Industry | 1 |
| ASI 300 | Principles of Livestock Feeding | 3 |
| ENTOM 300 | Economic Entomology | 3 |
| PLPTH 500 | Principles of Plant Pathology | 3 |
| FOR 285 | Introduction to Forestry | 3 |
| HORT 520 | Fruit Production | 3 |
| HORT 560 | Vegetable Crop Ecology | 3 |
| AGRON 340 | Grain Grading | 2 |
| ASI 350 | Meat Science | 2 |
| ASI 361 | Meat Processing | 2 |
| ASI 302 | Introduction to Food Science | 3 |
| GRSC 305 | Fundamentals of Food Processing | |
| | or | |
| ASI 305 | Fundamentals of Food Processing | 3 |
| GRSC 100 | Principles of Milling | 3 |
| GRSC 120 | Introductory Bakery Technology | 2 |
| GRSC 121 | Introductory Bakery Technology Laboratory | 1 |
| FN 132 | Basic Nutrition | 3 |
| FN 301 | Trends in Food Products | 3 |

Additional requirements for B.S. in agribusiness

| | | |
|---|---|-----------|
| ACCTG 221 | Managerial Accounting | 3 |
| AGEC 505 | Agricultural Market Structures | 3 |
| AGEC 518 | Agribusiness Management | 3 |
| AGEC 515 | Marketing of Agricultural and Food Products | 3 |
| Four of the following, including two marked* | | 12 |
| AGEC 510 | Agricultural Policy | |
| AGEC 512* | Farm Management | |
| AGEC 513 | Agricultural Finance | |
| AGEC 516 | Agricultural Law and Economics | |
| AGEC 517 | Rural Banking | |
| AGEC 520 | Grain Marketing | |
| | or | |
| AGEC 521 | Livestock Meat Marketing | |
| AGEC 522 | Commodity Futures Markets | |
| AGEC 525 | Natural Resource Economics | |
| AGEC 605* | Price Analysis and Forecasting | |
| AGEC 615 | International Agricultural Development | |
| AGEC 623* | Export Marketing of Agricultural and Food Products | |
| AGEC 631 | Principles of Transportation | |
| AGEC 632 | Agribusiness Logistics | |
| AGEC 710* | Advanced Agribusiness Management | |
| AGEC 712* | Linear Programming Applications in Agricultural Economics | |
| AGEC 736 | Natural Resource Policy | |

| | | |
|-----------------------------|---------------------|----------|
| Two of the following | | 6 |
| FINAN 450 | Business Finance | |
| MANGT 420 | Management Concepts | |
| MKTG 400 | Marketing | |

| | |
|--------------------------------------|-------|
| Business elective | 3 |
| Agricultural science elective(s)** | 3-6 |
| Statistics*** | 3-6 |
| Public economic policy electives**** | 6 |
| General electives | 13-17 |

Total including first 4 semesters 127

Either AGECE 513 or FINAN 450 must be included in the program of study.

**Select from agricultural and food science electives listed above. At least 11 credits required, including those taken in the first two years.

***Either STAT 330 or STAT 350 and 351.

****Two courses from AGECE 510, AGECE 525, AGECE 736, ECON 510, and ECON 530, with at least one from ECON 510 and ECON 530.

Agricultural economics

Agricultural economics is the study of the economic factors affecting agricultural production, food consumption, commodity marketing, farm management, natural resource use and management, and agricultural finance and trade.

Farm management option

This option includes course work in livestock and crop production, agricultural mechanization, and in agricultural economics applied to farm management.

The suggested schedule for the first two years is the same as that for the agribusiness degree except that ASI 102 and a laboratory and AGRON 220 are the required agricultural science courses. The additional requirements are below.

| | | |
|---|---|-----------|
| AGEC 505 | Agricultural Market Structures | 3 |
| AGEC 512 | Farm Management | 3 |
| AGEC 513 | Agricultural Finance | 3 |
| Four of the following, including one marked* | | 12 |
| AGEC 510 | Agricultural Policy | |
| AGEC 515 | Marketing of Agricultural and Food Products | |
| AGEC 516 | Agricultural Law and Economics | |
| AGEC 517 | Rural Banking | |
| AGEC 518 | Agribusiness Management | |
| AGEC 520 | Grain Marketing | |
| | or | |
| AGEC 521 | Livestock Meat Marketing | |
| AGEC 522 | Commodity Futures Markets | |
| AGEC 525 | Natural Resource Economics | |
| AGEC 605* | Price Analysis and Forecasting | |
| AGEC 615 | International Agricultural Development | |
| AGEC 623* | Export Marketing of Agricultural and Food Products | |
| AGEC 631 | Principles of Transportation | |
| AGEC 632 | Agribusiness Logistics | |
| AGEC 710* | Advanced Agribusiness Management | |
| AGEC 712* | Linear Programming Applications in Agricultural Economics | |
| AGEC 736 | Natural Resource Policy | |
| AGRON 305 | Soils | 4 |

| | | |
|----------------------------|--------------------------------------|----------|
| Select 9 hours from | | 9 |
| AGRON 330 | Weed Management | |
| AGRON 375 | Soil Fertility | |
| AGRON 501 | Range Management | |
| ASI 300 | Principles of Livestock Feeding | |
| ASI 318 | Fundamentals of Nutrition | |
| ASI 400 | Farm Animal Reproduction | |
| ASI 515 | Beef Science | |
| ASI 535 | Swine Science | |
| ATM 324 | Tillage-Planting Machinery | |
| ATM 325 | Crop Harvesting and Handling Systems | |
| ATM 351 | Engine and Tractor Power | |
| ATM 563 | Electrical Systems and Controls | |
| ATM 571 | Agricultural Building Systems | |
| ENTOM 300 | Economic Entomology | |
| PLPTH 500 | Principles of Plant Pathology | |

| | | |
|--------------------------|---------------------------------|------------|
| Select one course | | 3-4 |
| ATM 300 | Engineering in Agriculture | |
| ATM 351 | Engine and Tractor Power | |
| ATM 511 | Agricultural Building Systems | |
| ATM 563 | Electrical Systems and Controls | |

| | |
|------------------------------------|-------|
| Statistics** | 3-6 |
| Public economic policy elective*** | 6 |
| General electives | 12-16 |

Total including first 4 semesters 127

**Either STAT 330 or STAT 350 and STAT 351.

***Two courses from AGECE 510, AGECE 525, AGECE 736, ECON 510, and ECON 530, with at least one from ECON 510 and ECON 530.

Specialty option

This option allows students to combine agricultural economics with a specialty of 15 hours in any other department or field in the University.

Requirements for the first two years are the same as for the agribusiness degree. Additional requirements are below.

| | | |
|---|---|-----------|
| AGEC 505 | Agricultural Market Structures | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| Select six courses, two from those marked* | | 18 |
| AGEC 510 | Agricultural Policy | |
| AGEC 512* | Farm Management | |
| AGEC 513 | Agricultural Finance | |
| AGEC 515 | Marketing Agricultural and Food Products | |
| AGEC 516 | Agricultural Law and Economics | |
| AGEC 517 | Rural Banking | |
| AGEC 518 | Agribusiness Management | |
| AGEC 520 | Grain Marketing | |
| | or | |
| AGEC 521 | Livestock and Meat Marketing | |
| AGEC 522 | Commodity Futures Markets | |
| AGEC 525 | Natural Resource Economics | |
| AGEC 605* | Price Analysis and Forecasting | |
| AGEC 615 | International Agricultural Development | |
| AGEC 623* | Export Marketing of Agricultural and Food Products | |
| AGEC 631 | Principles of Transportation | |
| AGEC 632 | Agribusiness Logistics | |
| AGEC 710* | Advanced Agribusiness Management | |
| AGEC 712* | Linear Programming Applications in Agricultural Economics | |
| AGEC 736 | Natural Resource Policy | |

| | |
|--|-------|
| Statistics** | 3-6 |
| Public economic policy electives*** | 6 |
| Specialization in a second department or field, at least 6 credit hours at 500 level or higher | 15 |
| General electives | 13-16 |

Total including first 4 semesters 127

**Either STAT 330 or STAT 350 and 351.

***Two courses from AGECE 510, AGECE 525, AGECE 736, ECON 510, and ECON 530, with at least one from ECON 510 and ECON 530.

Professional option

This option requires additional mathematics, statistics, or computer science to prepare the student for advanced degree studies in agricultural economics.

Requirements for the first two years are the same as for the agribusiness degree. Additional requirements are below.

| | | |
|---|---|-----------|
| AGEC 505 | Agricultural Market Structures | 3 |
| Select six courses, two from those marked* | | 18 |
| AGEC 510 | Agricultural Policy | |
| AGEC 512* | Farm Management | |
| AGEC 513 | Agricultural Finance | |
| AGEC 515 | Marketing of Agricultural and Food Products | |
| AGEC 516 | Agricultural Law and Economics | |
| AGEC 517 | Rural Banking | |
| AGEC 518 | Agribusiness Management | |
| AGEC 520* | Grain Marketing | |
| | or | |
| AGEC 521 | Livestock and Meat Marketing | |
| AGEC 522 | Commodity Futures Markets | |
| AGEC 525 | Natural Resource Economics | |
| AGEC 605* | Price Analysis and Forecasting | |
| AGEC 615 | International Agricultural Development | |
| AGEC 623* | Export Marketing of Agricultural and Food Products | |
| AGEC 631 | Principles of Transportation | |
| AGEC 632 | Agribusiness Logistics | |
| AGEC 710* | Advanced Agribusiness Management | |
| AGEC 712* | Linear Programming Applications in Agricultural Economics | |
| AGEC 736 | Natural Resource Policy | |

| | | |
|-----------|--|------------|
| ACCTG 221 | Managerial Accounting | 3 |
| STAT 350 | Business and Economic Statistics I | 3 |
| STAT 351 | Business and Economic Statistics II | 3 |
| MATH 551 | Applied Matrix Theory | 3 |
| | Public economic policy elective** | 3 |
| ECON 510 | Intermediate Macroeconomics | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| | Computer programming laboratory | 2 |
| | General electives | 20 |
| | Total including first 4 semesters | 127 |

**Select one course from AGECE 510, AGECE 525, AGECE 736, and ECON 530.

Graduate study

Master's and doctoral programs are offered in agricultural economics. Students take course work in agricultural economics, general economics, and statistics. Research interest areas include marketing, farm management, agricultural finance, prices, production economics, taxation, agricultural policy, international development, and agricultural business and industry.

Courses in agricultural economics

Undergraduate credit

AGECE 100. Agricultural Economics and Agribusiness. (3) I, II. A course suggested for all students interested in the agricultural economy. A study of economic principles, with emphasis on their application to the solution of farm, agribusiness, and agricultural industry problems in relationship to other sectors of the United States economy and foreign countries. No prerequisite. Three hours lec. a week. AGECE-100-0-0111

AGECE 441. Agricultural Economics and Agribusiness Seminar. (Var.) Seminars of special interest will be offered upon sufficient demand in selected areas relating to agricultural economics and agribusiness or competitive teams qualifying for academic credit. AGECE-441-0-0111

AGECE 445. Agribusiness Internship. (1-3) I, II, S. Approved and supervised work-study programs in various areas of agribusiness. Project reports required. Pr.: Junior standing and prior departmental approval. AGECE-445-2-0111

AGECE 490. Computer Applications in Agricultural Economics. (3) I, II. Application of microcomputers to problems in agricultural economics. Emphasis on budgeting, cash flow, record keeping, financial analysis, and information analysis. Two hours rec. and three hours lab a week. Pr.: AGECE 100 or ECON 120, and MATH 100. AGECE-490-1-0111

Undergraduate and graduate credit in minor field

AGECE 500. Production Economics. (3) I, II. Application of economic principles to problems of agriculture. Economic structure and aspects of American agriculture; analysis of demand, supply, production of agricultural products with particular reference to the firm. AGECE 505 is a continuation of this course and they are intended to be taken in consecutive semesters. Three hours rec. a week. Pr.: AGECE 100 or ECON 120. AGECE-500-0-0111

AGECE 505. Agricultural Market Structures. (3) I, II. Theory and application of economic principles to marketing problems in agriculture. Pricing of agricultural output and productive services under various forms of economic organization and competition; regional specialization, location, and trade; determinants of economic change; evaluation of economic and consumer welfare. Three hours rec. a week. Pr.: AGECE 100 or ECON 120. AGECE-505-0-0111

AGECE 508. Farm and Ranch Management. (3) I. Organization and management of a farm and ranch; selection of livestock or crop system; economies of size of business; financial management of the business. Intended for nonmajors. Two hours rec. and two hours lab a week. Pr.: AGECE 100. AGECE-508-1-0111

AGECE 510. Agricultural Policy. (3) I. Analytical treatment of recent and current economic problems and governmental policies and programs affecting American agriculture; includes price and income, rural development, and rural poverty problems. Pr.: Junior standing. AGECE-510-0-0111

AGECE 512. Farm Management. (3) II. Principles and practices of organization and management; nature and structure of business; functions and operations; management tools; decision-making processes. Three hours rec. a week. Pr.: AGECE 500. AGECE-512-1-0111

AGECE 513. Agricultural Finance. (3) I. Analysis of capital investments, interpretation of financial statements, capital structure considerations for agricultural firms, and farm real estate pricing. Three hours rec. a week. Pr.: ECON 110, AGECE 100 or ECON 120, ACCTG 211. AGECE-513-0-0111

AGECE 515. Marketing of Agricultural and Food Products. (3) I. A broad view of marketing; food markets and consumption; marketing functions and institutions; prices, competition, and marketing costs; functional and organizational issues; food marketing regulations; commodity marketing. Three hours rec. a week. Pr.: AGECE 100 or ECON 120. AGECE-515-0-0111

AGECE 516. Agricultural Law and Economics. (3) I. The legal framework for decision making by farm firms, families, and individuals; liabilities, real and personal property, contracts, uniform commercial code, organization of farm firms, intergenerational property transfers, water law, fence law, federal and state regulatory power, insurance, income tax, and social security. Three hours rec. a week. Pr.: ECON 110 and junior standing. AGECE-516-0-0111

AGECE 517. Rural Banking. (3) II. Management of banks in rural areas including organization and personnel, sources and uses of funds, credit, and services, particularly to farmers and agricultural businesses; role of rural banks in the U.S. banking system. Two hours rec. and two hours lab a week, including field trips and guest bankers. Pr.: ECON 110, ACCTG 211, and junior standing. AGECE-517-1-0111

AGECE 518. Agribusiness Management. (3) I, II. A study of the concept of agribusiness and its relationship to the economy as a whole. Particular attention is given to the application of economic principles in the management of marketing and farm supply firms. Three hours rec. a week. Pr.: AGECE 100 or ECON 120 and ACCTG 211. AGECE-518-0-0111

AGECE 520. Grain Marketing. (3) I. Price influences and relationships, market structure, buying and selling problems, domestic and export trade; grain trade organization and regulation. Three hours rec. a week, including field trips. Pr.: ECON 110. AGECE-520-0-0111

AGECE 521. Livestock and Meat Marketing. (3) II. A study of the market structure and organization of the livestock meat economy, with emphasis on factors affecting prices, changing competitive market arrangements, and marketing problems of farmers and ranchers, market agencies, and processing firms. Three hours rec. a week. Pr.: ECON 110. AGECE-521-0-0111

AGECE 522. Commodity Futures Markets. (3) II. The evaluation, function, mechanics, analysis, and application of the commodity futures markets are discussed. Topics include fundamental commodity price analysis; technical analysis; hedging and forward pricing applications; and sources, uses, and interpretation of commodity market information. Three hours rec. a week. Pr.: AGECE 100 or ECON 120. AGECE-522-0-0111

AGECE 524. Agricultural Cooperatives. (3) I. A study of the nature and role of cooperatives and other types of group action with emphasis on agricultural cooperatives. Particular attention to the unique economic decision problems in organization, finance, and marketing. Three hours rec. a week. Pr.: AGECE 100 or ECON 120, and ACCTG 211. AGECE-524-0-0111

AGECE 525. Natural Resource Economics. (3) I. Emphasis on the application of welfare economics concepts in the study of current natural resource uses, policies, and problems. Introductory course for students interested in problems of natural resource use and environmental quality. Three hours rec. a week. Pr.: ECON 110 and junior standing. AGECE-525-0-0111

AGECE 541. Agricultural Economics and Agribusiness Seminar. (Var.) Seminars of special interest will be offered upon sufficient demand in selected areas relating to agricultural economics and agribusiness. AGECE-541-0-0111

Undergraduate and graduate credit

AGECE 605. Price Analysis and Forecasting. (3) II. The analysis of selected agricultural prices; application of regression analysis to price analysis, the role of futures markets and market efficiency, optimal hedging strategies, commodity option pricing, and price forecasting. Three hours rec. a week. Pr.: STAT 330 or 351; AGECE 490; AGECE 505 or ECON 520. AGECE-605-0-0111

AGECE 615. International Agricultural Development. (3) II. A study of principles of economic development and national and international policies that will stimulate development. Individual study is encouraged to meet student interests for understanding the problems and policies for agricultural development and the influence of such development on international policies of the United States. Three hours rec. a week. Pr.: ECON 110. AGECE-615-0-0111

AGECE 623. Export Marketing of Agricultural and Food Products. (3) II. Applied economics of export marketing. Emphasis on international trade in agricultural products and understanding the international marketing system within which export sales of agricultural and food products take place. Three hours rec. a week. Pr.: AGECE 505. AGECE-623-0-0111

AGECE 631. Principles of Transportation. (3) II, some S. The historical development and economic importance of rail, motor, air, water, and pipeline transportation in the United States—routes, services, rates, public regulation. Pr.: ECON 110. AGECE-631-0-0111

AGECE 632. Agribusiness Logistics. (3) I. Planning for efficient use of transportation, storage and processing facilities in the handling of raw materials and products for agribusiness firms, controlling shipments and inventory in coordination with warehouse and handling operations, and scientific selection of routes, schedules, and equipment. Pr.: ECON 110 and junior standing. AGECE-632-0-0111

AGECE 641. Agricultural Economics and Agribusiness Seminar. (Var.) Seminars of special interest will be offered upon sufficient demand in selected areas relating to agricultural economics and agribusiness. Pr.: Junior standing and consent of the instructor. AGECE-641-0-0111

AGECE 710. Advanced Agribusiness Management. (3) I. Application of quantitative long-range planning tools for agribusiness. Two hours rec. and two hours lab a week. Pr.: AGECE 518 or graduate standing. AGECE-710-1-0111

AGECE 712. Linear Programming Applications in Agricultural Economics. (3) II. Application of linear programming and related topics for decision analysis in agricultural firms. Pr.: AGECE 500. AGECE-712-0-0111

AGECE 736. Natural Resource Policy. (3) II. Economic evaluation of resource use policies and impact of those policies on welfare economics. Applications of welfare economics concepts. Externalities are emphasized. For intermediate-level, upper-division undergraduates with a strong economics background, beginning graduate

students in economics, and other graduate students. Pr.: Six credit hours in agricultural economics and economics, and junior standing. AGEC-736-0-0111

AGEC 740. Seminar in Agricultural Economics Analysis. (Var.) Seminar on methods of economic analysis will be offered upon sufficient demand. Pr.: Consent of instructor. AGEC-740-1-0111.

AGEC 750. Agricultural Economics and Agribusiness Problems. (Var.) I, II, S. Pr.: Junior standing and consent of the instructor. AGEC-750-3-0111

Graduate credit

AGEC 805. Agricultural Marketing. (3) S. The study of the demand for supply of agricultural commodities, alternative market structures, the dynamics of marketing institutions that affect market structures, governmental intervention in agricultural markets, futures markets in agriculture, and international agricultural commodities trade. Three hours rec. a week. Pr.: AGEC 505 or ECON 520. AGEC-805-0-0111

AGEC 810. Price and Income Policies for Agriculture. (3) I. A study of the effects of government price, regulatory, and tax policies on (1) farm income levels and variability, (2) farm productivity and output, (3) economic structure of farming, and (4) performance of agricultural markets. Three hours rec. a week. Pr.: AGEC 500 or ECON 520, ECON 510. AGEC-810-0-0111

AGEC 812. Advanced Farm Economics. (3) I. A study of managerial techniques and processes applied to farm firms involved in production and marketing of agricultural products. This study includes managerial planning, evaluation, and control of farm businesses. Three hours rec. a week. Pr.: AGEC 512. AGEC-812-0-0111

AGEC 823. Production Economics II. (3) I. Economic theories of choice under conditions of imperfect knowledge (i.e., under risk and uncertainty) and the application of these theories to production decisions. Pr.: AGEC 500 or consent of instructor. AGEC-823-0-0111

AGEC 831. Agricultural Marketing Management and Analysis. (Var.) I, II, S. Marketing problems of firms that market or process farm products or handle farm supplies, with special emphasis on tools of analysis for solving marketing problems. Supervision of students' internship programs. Pr.: Consent of instructor. AGEC-831-0-0111

AGEC 840. Marketing Strategies and Policies in International Grain Markets. (3) I. Modeling price information processes in imperfect world food and feed grains markets with special reference to structure, government policies, and international exchange rate effects. Reaction strategies of firms and nations considered. Resulting domestic agricultural price and trade policies of major trading nations explored. Three hours rec. a week. Pr.: ECON 815 and ECON 861. AGEC-840-0-0111

AGEC 898. Agricultural Economics Master's Report. (Var.) I, II, S. Master's report. AGEC-898-4-0111

AGEC 899. Agricultural Economics Master's Research. (Var.) I, II, S. Research for master's thesis. AGEC-899-4-0111

AGEC 901. Research Methods in Economics. (3) I. A study of scientific methodology in economic research including the history of various debates regarding methodology in economics. The course also deals with problem definition, formulation of hypotheses, listing of hypotheses, and presentation of research results. Three hours rec. a week. Pr.: Graduate standing. AGEC-901-0-0111

AGEC 905. Agricultural Demand and Price Analysis. (3) II. A study of the demand for and supply of farm products, price formation and markets, the causes of price variation and instability, the dynamic analysis of agricultural prices. Three hours rec. a week. Pr.: ECON 730, AGEC 805, ECON 945. AGEC-905-0-0111

AGEC 922. Seminar in Agricultural Marketing. (Var.) On sufficient demand. Analysis of special problems and current developments faced by firms and agencies associated with the marketing process for agricultural products. Pr.: Consent of instructor. AGEC-922-0-0111

AGEC 923. Economics of Agricultural Production. (3) 1. A study of agricultural production response to prices; methods of estimating supply response and price expectations; the effects of government and institutions on agricultural supply and the role of risk, technical change, and the number and size of farms on agricultural supply. Three hours rec. a week. Pr.: ECON 730, AGEC 823, ECON 945. AGEC-923-0-0111

AGEC 936. Quantitative Topics in Agricultural Economics. (3) II, in even years. A study of recent developments reported in the literature concerning quantitative methods of analysis in agricultural economics and economics. The study will include assigned projects to apply selected techniques of analysis. Three hours rec. a week. Pr.: ECON 935. AGEC-936-0-0111

AGEC 940. Seminar in Agricultural Economics. (Var.) On sufficient demand. Problems and current developments in agricultural economics. Pr.: Consent of instructor. AGEC-940-0-0111

AGEC 955. Independent Study of Advanced Topics in Agricultural Economics. (Var.) I, II, S. Advanced independent study of an agricultural economics topic based upon a student proposal approved by the student's supervisory committee. Pr.: Completion of 24 credits of graduate study. AGEC-955-0-0111

AGEC 999. Agricultural Economics Ph.D. Research. (Var.) I, II, S. Research for Ph.D. dissertation. AGEC-999-4-0111

Agricultural Education

Advisors—Harbstreit, Parmley, and Welton

Undergraduate study
Bachelor of science in agriculture—
130 semester hours

Agricultural education is designed primarily for those who are interested in teaching agriculture. However, because of their overall background and well-rounded education in agriculture, agricultural education graduates are employed in fields other than education. Agricultural education prepares graduates for these and other positions: high school agricultural education teacher, community college agriculture teacher, farm and ranch manager, extension agricultural or 4-H agent, agricultural finance, agribusiness sales, soil conservation services, and international agriculture.

Freshman

| First semester | |
|----------------|---|
| BIOL 198 | Principles of Biology 4 |
| EDAO 319 | Agricultural Education Colloquium 2 |
| ENGL 100 | English Composition I 3 |
| MATH 100 | College Algebra 3 |
| PE 101 | Principles of Physical Fitness 1 |
| | Agricultural science elective* 4 |
| | 17 |

| Second semester | |
|-----------------|------------------------------------|
| CHM 110 | General Chemistry 5 |
| ENGL 120 | English Composition II 3 |
| PSYCH 110 | General Psychology 3 |
| HORT 200 | Plant Science 4 |
| | or |
| AGRON 220 | Crop Science 4 |
| | 15 |

Sophomore

| First semester | |
|----------------|--|
| AGEC 100 | Agricultural Economics and Agribusiness 3 |
| ATM 151 | Agricultural Mechanics Practices 2 |
| ECON 110 | Economics I 3 |
| EDAF 215 | Educational Implications of Growth and Development 3 |
| SPCH 105 | Public Speaking IA 2 |
| | General electives 2 |
| | Humanities electives 2 |
| | 17 |

Second semester

| | |
|-----------|--------------------------------------|
| AGRON 305 | Soils 4 |
| ATM 351 | Engine and Tractor Power 3 |
| | Agricultural management 3 |
| | Social science electives 3 |
| | Humanities electives 3 |
| | 16 |

Junior

| First semester | |
|----------------|--|
| EDAF 315 | Educational Psychology 3 |
| EDAF 323 | Exceptional Students in the Secondary School 2 |
| | Social science electives 3 |
| | Humanities electives 3 |
| | Agricultural science electives* 4 |
| | 15 |

Second semester

| | |
|----------|--|
| EDAO 620 | Principles of Vocational Education 3 |
| EDAO 621 | Program Planning in Vocational Education 3 |
| EDCI 318 | Instructional Media and Technology 2 |
| EDCI 477 | Middle Level/Secondary Reading 2 |
| | Agricultural science electives* 2 |
| | Agricultural engineering electives 3 |
| | 15 |

Senior

| First semester | |
|----------------|--|
| ATM 659 | Agricultural Mechanics Methods 3 |
| EDAF 525 | Interpersonal Relations in the Schools 1 |
| EDAO 500 | Methods of Teaching Agriculture 2 |
| EDAO 576 | Professional Development Seminar 2 |
| EDAO 586 | Teaching Participation in Secondary School 8 |
| EDCI 455 | Teaching in a Multicultural Society 1 |
| | 17 |

Second semester

| | |
|---------|--|
| ATM 323 | Tillage, Plant, Crop Harvest Systems 3 |
| | or |
| ATM 324 | Tillage Plant Machines** 2 |
| | or |
| ATM 325 | Crop Harvest Handling Systems** 2 |
| | Agricultural science electives* 8 |
| | Agricultural engineering electives 2 |
| | General electives 5 |
| | 18 |

*A minimum of 3 hours of animal science course work must be completed as part of the 18 hours of agricultural science electives.

**One additional hour of agricultural mechanics will be required if this class is selected.

Specialty certification

Special certification is available. The combination of 16 required and elective credit hours in agricultural sciences from one of the following areas is required: animal sciences; crops and soils; horticulture; agricultural mechanics; agribusiness (credit from AGECE and business administration). A minimum of 3 hours of animal science course work must be completed in 23 hours required for speciality certification.

Eight weeks during the first or second semester of the senior year are devoted to full-time student teaching. On-campus courses meet during the first eight weeks of the semester. When student teaching is taken in the spring, fall semester courses are moved to spring semester.

Because state certification requirements are currently being revised, completion of degree requirements as listed for agricultural education may not meet state certification requirements to teach vocational agriculture as specified by the Kansas Department of Education.

See the College of Education section of this catalog.

Agricultural Journalism

Advisor—Erpelding

Undergraduate study

Bachelor of science in agriculture—127 semester hours

The major in agricultural journalism prepares students for various communications positions in newspaper, magazine, radio-television, public relations, and agricultural information. Students in agricultural journalism have access to the Associated Press wire service, FM radio facilities, television studio and portable equipment, modern electronic editing terminals, photographic equipment and laboratory, computer-operated typesetting equipment, and desktop publishing facilities.

Students majoring in this curriculum take the following courses:

General requirements

| | | |
|-----------|-----------------------------------|----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| GENAG 101 | Ag Orientation | 1 |
| MATH 100 | College Algebra | 3 |
| ECON 110 | Economics I | 3 |
| CHM 110 | Chemistry I | 4 |
| | or | |
| CHM 210 | General Chemistry | 5 |
| PE 101 | Principles of Physical Fitness | 1 |
| | Humanities and/or social sciences | 12 |

Department course requirements

Students must complete a total of 30 credit hours in agricultural courses. Area requirements are:

Agriculture core

Any four courses from the following:

| | | |
|-----------|---|---|
| AGRON 305 | Soils | 4 |
| HORT 200 | Plant Science | 4 |
| | or | |
| AGRON 220 | Crop Science | 4 |
| ASI 102 | Principles of Animal Science | 3 |
| AGEC 100 | Agricultural Economics and Agribusiness | 3 |

Any course in agricultural engineering

| | | |
|-----------|---|---|
| ENTOM 300 | Economic Entomology | 3 |
| | or | |
| ENTOM 305 | Livestock Entomology | 2 |
| | or | |
| ENTOM 320 | Horticultural Entomology | 3 |
| PLPTH 500 | Principles of Plant Pathology | 3 |
| FOR 375 | Introduction to Natural Resource Management | 3 |
| ASI 302 | Introduction to Food Science | 3 |

Biological sciences

Required:

| | | |
|----------|-----------------------|---|
| BIOL 198 | Principles of Biology | 4 |
| | or | |
| BIOL 210 | General Botany | 4 |

One of the following:

| | | |
|----------|-----------------------------------|---|
| ASI 500 | Genetics | 3 |
| BIOL 201 | Organismic Biology | 5 |
| BIOL 220 | Bacteriology and Man | 3 |
| BIOL 303 | Ecology of Environmental Problems | 3 |

Statistics and computer science

One course from the following:

| | | |
|----------|---|---|
| CIS 110 | Introduction to Personal Computing | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| | and | |
| | Computer Language Lab (200 level) | 2 |
| STAT 340 | Biometrics I | 3 |
| STAT 350 | Business and Economic Statistics I | 3 |
| | or | |
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |

Physical science

One course from the following:

| | | |
|-----------|---|---|
| BIOCH 120 | Introductory Organic and Biological Chemistry | 5 |
| BIOCH 201 | Elementary Biochemistry | 3 |
| BIOCH 521 | General Biochemistry | 3 |
| CHM 190 | Elementary Organic Chemistry | 3 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 531 | Organic Chemistry I | 3 |
| GEOL 100 | Introductory Geology | 3 |
| GEOG 220 | Environmental Geography I | 4 |

Business administration and agricultural economics:

Required:

| | | |
|-----------|---|---|
| ACCTG 211 | Financial Accounting | 3 |
| | One of the following: | |
| ACCTG 221 | Managerial Accounting | 3 |
| AGEC 518 | Agribusiness Management | 3 |
| ECON 530 | Money and Banking | 3 |
| ECON 631 | Principles of Transportation | 3 |
| MANGT 202 | Small Business Operation | 3 |
| MANGT 390 | Business Law I | 3 |
| MANGT 420 | Management Concepts | 3 |
| MKTG 400 | Marketing | 3 |
| MKTG 542 | Sales Management | 3 |
| | All other courses in AGECE with a 500 or higher course number | |

Agricultural specialization

In consultation with the advisor, the student will decide to study one area of agriculture in depth. The student

will take two courses above the introductory level (advanced courses are defined as those with a prerequisite in that agriculture department).

Agricultural electives

Students may choose any other courses in the College of Agriculture to complete the 30 hours of agriculture.

Journalism

Students must complete a minimum of 30 hours in journalism and mass communications courses. Maximum journalism hours allowed is 36.

Journalism core

These 18 hours are required of all students.

| | |
|---------|--|
| JMC 235 | Introduction to Mass Communications |
| JMC 275 | News and Feature Writing |
| JMC 280 | Editing and Design |
| JMC 380 | Advanced News and Feature Writing |
| JMC 665 | Law of Mass Communications |
| JMC 660 | History of Journalism |
| | or |
| JMC 685 | The Mass Communicator: Ethics and Issues |

Journalism electives—remaining 12 to 18 hours in journalism may be chosen by the student in consultation with the faculty advisor.

Agricultural Technology Management

Faculty—Baugher, Chung,* Clark,* Heber,* Manges,* Schrock,* Slocombe,* Spillman,* and Steichen.*

Undergraduate study

Bachelor of science in agriculture—127 semester hours

Agricultural technology management emphasizes the application and integration of agricultural/biological sciences, agricultural engineering systems, and business to manage human and natural resources in the production and processing of food and agricultural products. It prepares men and women for technical management positions in food and agricultural industries which require an understanding of both technology and management. Agricultural technology management graduates are typically employed in technical sales, agricultural product and food processing, manufacturing technology, and technical services.

The technological courses are applications-oriented, and focus on practical experience in food processing systems, soil and water management, power and machinery systems, electrical systems and electronics, and agricultural building systems. Business courses include accounting, marketing, management, law and finance, along with courses in economics. Supporting courses provide a foundation of mathematics, chemistry, and computer and communication skills. Technical electives are available to develop a degree program that meets personal career objectives.

The curriculum is administered by the Department of Agricultural Engineering and leads to the bachelor of science degree in agriculture with a major in agricultural technology management.

General requirements

| | | |
|-----------|--|-------|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| PE 101 | Principles of Physical Fitness | 1 |
| GENAG 101 | Ag Orientation | 1 |
| ECON 110 | Economics I | 3 |
| AGEC 100 | Agricultural Economics and Agribusiness | 3 |
| | or | |
| ECON 120 | Economics II | 3 |
| MATH 100 | College Algebra | 3 |
| MATH 150 | Plane Trigonometry | 3 |
| MATH 205 | General Calculus and Linear Algebra | 3 |
| CHM 110 | General Chemistry | 5 |
| | or | |
| CHM 210 | Chemistry I | 4 |
| BIOL 198 | Principles of Biology | 4 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| ME 212 | Engineering Graphics I | 2 |
| BIOCH 120 | Introduction to Organic and Biological Chemistry | 5 |
| ACCTG 211 | Financial Accounting | 3 |
| HORT 200 | Plant Science | 4 |
| | or | |
| AGRON 220 | Crop Science | 4 |
| AGRON 305 | Soils | 4 |
| | | 59-60 |

Departmental requirements

| | | |
|---------|---|----|
| ATM 340 | Computer Applications in Agricultural Technology Management | 2 |
| ATM 351 | Engine and Tractor Power | 3 |
| ATM 440 | Introduction to Food Engineering Technology | 3 |
| ATM 450 | Functional Components of Machinery | 3 |
| ATM 511 | Agricultural Building Systems | 3 |
| ATM 558 | Soil Erosion and Sediment Pollution Control | 3 |
| ATM 563 | Electrical Systems and Controls | 3 |
| | | 20 |

Humanities and social science electives

Humanities and social science electives 12

Free electives

Free electives 2-3

Communication elective

Choose one of the following:

| | | |
|----------|--|---|
| ENGL 415 | Written Communication for Engineers | 3 |
| ENGL 516 | Written Communication for the Sciences | 3 |
| MKTG 442 | Sales Communication | 3 |

A second semester of modern language can substitute for the communication elective.

Option requirements

A specific option requires a minimum of 6 hours of additional agricultural technology management course work.

A total of 30 hours is required. Requirements for the various options are listed below.

Production option

| | | |
|---------|---|---|
| ASI 102 | Principles of Animal Science | 3 |
| | ATM electives (other than ATM 300 and required courses) | 9 |
| | An additional course in biology, plant pathology, entomology, or genetics | 3 |
| | Business administration or agricultural economics elective | 3 |
| | Technical elective | 3 |

Choose at least 9 hours from one of these three groups: animal sciences, crop and soil sciences, or agricultural economics

| | | |
|------------------------|--|----|
| | | 9 |
| | | 30 |
| Animal sciences | | |
| ASI 300 | Principles of Livestock Feeding | 3 |
| ASI 318 | Fundamentals of Nutrition | 3 |
| ASI 320 | Principles of Feeding (cannot take 300 and 320) | 3 |
| ASI 500 | Genetics | 3 |
| ASI 515 | Beef Science | 3 |
| ASI 524 | Sheep Science | 2 |
| ASI 535 | Swine Science | 3 |
| ASI 545 | Range Livestock Management | 2 |
| ENTOM 305 | Livestock Entomology | 2 |
| | Other ASI courses may be selected with consent of the advisor. | |

Crop and soil sciences

| | | |
|-----------|---|---|
| AGRON 330 | Weed Management | 3 |
| AGRON 375 | Soil Fertility | 3 |
| AGRON 385 | Soil Fertility Lab | 2 |
| AGRON 501 | Range Management | 3 |
| AGRON 520 | Grain Production | 3 |
| AGRON 525 | Crop and Soil Management | 3 |
| AGRON 635 | Soil Conservation | 3 |
| AGRON 746 | Physical Properties of Soils | 3 |
| ENTOM 300 | Economic Entomology | 3 |
| PLPTH 500 | Principles of Plant Pathology | 3 |
| | Other agronomy, horticulture, entomology and plant pathology courses may be selected with consent of the advisor. | |

Agricultural economics

Any agricultural economics course numbered 400 or above.

Business and industry option

| | | |
|-----------|---|---|
| ASI 102 | Principles of Animal Science | 3 |
| | or | |
| ASI 302 | Introduction to Food Science | 3 |
| | ATM electives (other than ATM 300 and required courses) | 6 |
| | Agricultural economics electives (400 and above) | 9 |
| | Choose two of the following: | |
| ACCTG 221 | Managerial Accounting | 3 |
| MKTG 400 | Marketing | 3 |
| MANGT 420 | Management Concepts | 3 |

Choose at least 6 hours from this list:

| | | |
|-----------|-----------------------------|---|
| ACCTG 221 | Managerial Accounting | 3 |
| MKTG 400 | Marketing | 3 |
| MKTG 450 | Consumer Behavior | 3 |
| ECON 390 | Business Law I | 3 |
| MANGT 420 | Management Concepts | 3 |
| FINAN 450 | Business Finance | 3 |
| ECON 510 | Intermediate Macroeconomics | 3 |
| ECON 530 | Money and Banking | 3 |
| ECON 681 | International Trade | 3 |
| IE 501 | Industrial Management | 3 |
| IE 502 | Industrial Management II | 3 |

Any AGECE course 400 and above.

30

Other economics or business administration courses may be selected with consent of the advisor.

Process operations option

| | | |
|-----------|---|---|
| ASI 302 | Introduction to Food Science | 3 |
| ATM 441 | Introduction to Food Engineering Technology Lab | 1 |
| | ATM electives (other than ATM 300 and required courses) | 9 |
| ASI 411 | Introductory Food Chemistry | 3 |
| ASI 694 | Food Plant Management | 2 |
| | or | |
| MANGT 420 | Management Concepts | 3 |

Choose 11 or 12 hours from this list:

| | | |
|----------|---|---|
| ATM 651 | Managing Farm Grains and Forage | 3 |
| AGEC 515 | Marketing of Agricultural and Food Products | 3 |
| | Food Products Evaluation | 3 |
| ASI 430 | Principles of Dairy Foods Processing | 4 |
| ASI 502 | | 4 |

| | | |
|----------|---|----|
| ASI 606 | Instrumental Analysis of Food and Agricultural Products | 2 |
| ASI 694 | Food Plant Management | 3 |
| ASI 725 | Food Analysis | 3 |
| GRSC 500 | Milling Technology I | 4 |
| GRSC 505 | Cereal and Feed Analysis | 3 |
| GRSC 602 | Cereal Science | 3 |
| GRSC 651 | Food and Feed Plant Sanitation | 4 |
| GRSC 655 | Flour and Feed Mill Construction | 3 |
| GRSC 710 | Fundamentals of Grain Storage | 2 |
| GRSC 715 | Fundamentals of Processing Grains for Food | 3 |
| | | 30 |

Other food or process related courses may be selected with consent of advisor.

Graduate study

Graduate study is offered leading to the master of science degree. Prerequisite is the completion of an undergraduate curriculum substantially equivalent to requirements for one of the options shown above.

Undergraduate credit

ATM 020. Agricultural Technology Management Assembly. (0) I, II. Presentation of professional problems and practices by students, faculty, and professionals associated with agricultural technology and systems. One hour lec. a month. ATM-020-0-0998

ATM 151. Agricultural Mechanics Practices. (2) I, II. An introduction to mechanics practices and skills basic to the repair, maintenance, and construction of tools and equipment. Includes arc, mig, and oxyacetylene welding, soldering, tool conditioning, and hot and cold metal work. Six hours lab a week. ATM-151-1-0998

ATM 300. Engineering in Agriculture. (4) I, II. An introduction to the application of basic engineering principles concerning agricultural power and machinery, soil and water conservation and irrigation, agricultural structures, and the use of electricity when applied to circuits, controls, motors, and crop conditioning, handling, and storage systems. Three hours rec. and two hours lab a week. Pr.: MATH 100. ATM-300-0-0998

ATM 323. Tillage, Planting, and Crop Harvesting Systems. (3) I, II. Recitation *only* of ATM 324 and ATM 325 to include operation, adjustment, and maintenance of primary and secondary tillage machinery; planting, herbicide, and fertilizer equipment; grain and forage harvesting machinery. Emphasis on tillage, planting, and crop harvesting systems. Student cannot receive credit for ATM 323 and ATM 324 or ATM 325. Three hours rec. a week. Pr.: AGRON 305. ATM-323-0-0998

ATM 324. Tillage and Planting Machinery. (2) I, II. Primary and secondary tillage machinery power requirements and field operations; planting equipment, herbicide placement and incorporation, fertilizer application, tillage-planting systems, and cost analysis. Three hours rec. and two hours lab a week for first half of semester. Pr.: AGRON 305. ATM-324-0-0998

ATM 325. Crop Harvesting and Handling Systems. (2) I, II. Grain harvesting machinery, fundamentals of operation, adjustment, and maintenance. Hay, forage, and crop residue handling systems; machine components, machine operation and maintenance, system selection and cost. Three hours rec. and two hours lab a week for second half of semester. ATM-325-1-0998

ATM 340. Computer Applications in Agricultural Technology Management. (2) I. Introduction to problem solving in agricultural technology management. Emphasis will be on using the computer to prepare reports, solve problems, and analyze data related to agricultural systems. Four hours lab a week. Pr.: MATH 100. ATM-340-1-0998

ATM 351. Engine and Tractor Power. (3) I, II. Operating principles of the internal combustion engine, ignition, fuel and lubricating systems, engine cooling, hydraulics, tune-up, maintenance, and tractor efficiency. Small engine power units and farm tractors receive greatest emphasis. Two hours rec. and three hours lab a week. Pr.: MATH 100. ATM-351-1-0998

ATM 440. Introduction to Food Engineering Technology. (3) I. Material and energy balances with application to food processing. Fluid flow and heat transfer in food processing. Thermodynamic properties and laws. Conc. enrollment in ATM 441 is urged. Three hours rec. a week. Pr.: PHYS 113 or 115, BIOCH 120 or CHM 190, MATH 210 or 205. ATM-440-0-0925

ATM 441. Introduction to Food Engineering Technology—Laboratory Exercises. (1) I. Laboratory experiments supplementing ATM 440. Three hours lab a week. Pr. or conc.: ATM 440. ATM-441-1-0925

ATM 450. Functional Components of Machinery. (3) II. Components used to transmit power on machinery and to perform functional operations. Major emphasis will be given to the fundamentals of operation and maintenance of bearings and hydraulic systems; gear, chain, belt and power take-off drives. Three hours rec. a week. Pr.: MATH 100. ATM-450-0-0998

Undergraduate and graduate credit in minor field

ATM 511. Agricultural Building Systems. (3) II. Concepts, fundamentals, and construction practices related to farmstead building systems including concrete mixtures, material selection, forces on structures causing failures, environmental control, insulation levels, ventilation fans, roofing, water and sewage, and farmstead layouts. Two hours rec. and three hours lab a week. Pr.: MATH 100 and junior standing. ATM-511-1-0998

ATM 526. Agricultural and Industrial Hydraulics. (2) I. This course is concerned with hydraulics and pneumatics as applied to agricultural and industrial equipment. Major emphasis is given to operating principles, components, accessories, fluids, circuits, and system maintenance. Two hours rec. a week. Pr.: MATH 100. ATM-526-0-0998

ATM 527. Agricultural and Industrial Hydraulics Lab. (1) I. Laboratory experiences supplementing ATM 526. Two hours lab a week. Pr. or conc.: ATM 526. ATM-527-1-0998

ATM 552. Agricultural Building Construction. (3) I. Selection and use of agricultural building materials including concrete and masonry, lumber, plywood, finishes, and fasteners. Application of hand and power tools and procedures in agricultural construction. Two hours rec. and three hours lab a week. Pr.: MATH 100. ATM-552-1-0998

ATM 555. Dairy Mechanics. (3) On sufficient demand. Installation, adjustment, and operation of dairy plant equipment; boilers, engines, motors, pumps, refrigeration machinery, water supply, and waste disposal. Two hours rec. and three hours lab a week. Pr.: Junior standing. ATM-555-1-0998

ATM 558. Soil Erosion and Sediment Pollution Control. (3) II. Water and wind erosion; estimating soil loss; estimating runoff rate and volume; laying out and checking terraces, waterways and farm ponds; agricultural surveying; and conservation planning. Two hours rec. and three hours lab a week. Pr.: MATH 100 and AGRON 305. ATM-558-1-0998

ATM 563. Electrical Systems and Controls. (3) I, II. The application of electricity to agriculture. Emphasis on principles of electricity, distribution and types of electric power, electrical load determination, wiring electrical circuits and controls, and the selection, operation, and maintenance of electric motors and controls. Two hours rec. and three hours lab a week. Pr.: MATH 100. ATM-563-1-0998

Undergraduate and graduate credit

ATM 615. Problems in Agricultural Technology Management. (Var.) I, II, S. Problems in the application of technical principles to agricultural technology management. Pr.: Approval of instructor. ATM-615-3-0998

ATM 630. Agricultural Machinery Management. (3) II. Considerations related to selection, operation, repair, maintenance, and replacement of agricultural machinery. Emphasis on effective use of computers for decision support. Two hours rec. and three hours lab a week. Pr.: ATM 340 or equivalent. ATM-630-1-0998

ATM 651. Managing Farm Grain and Forage. (3) I. Principles of grain and forage conditioning and storage. Structures and equipment for quality preservation. Two hours rec. and three hours lab a week. Pr.: MATH 100 and junior standing. ATM-651-1-0998

ATM 652. Soil and Water Conservation Practices. (3) II. The hydrological cycle; rainfall-runoff relationships; structural conservation practices for conserving water and controlling erosion; and drainage of agricultural lands. Two hours rec. and three hours lab a week. Pr.: AGRON 305, ATM 300, or ATM 558. ATM-652-1-0998

ATM 653. Irrigation Practices. (3) I. Principles and practices of irrigation involved in the setup and operation of various irrigation systems on the farm. Two hours rec. and three hours lab a week. Pr.: AGRON 305. ATM-653-1-0998

ATM 654. Agricultural Facilities and Machinery Management. (2) Analytic study of functional and economic feasibility when matching farm production operations and labor-saving facilities and equipment; special emphasis on selection of equipment. Six hours lab a week. Pr.: AGECE 100 and ATM 651. ATM-654-1-0998

ATM 659. Agricultural Mechanic Methods. (3) I, II. Methods of teaching agricultural mechanics at the high school level. This includes management procedure, curriculum planning, facilities, and organization of equipment and tools. The preparation of exercise sheets, organization, and presentation of class lessons is emphasized. Three hours rec. and four hours lab a week for first half of semester. Pr.: Conc. enrollment in student teaching. ATM-659-1-0998

ATM 660. Farm Animal-Waste Management. (3) II. Current practices, knowledge, and problems relating to disposal or use of farm animal wastes. Attention is given to environmental, ecological, and socio-economic consequences of alternative ways in which such wastes are accumulated, handled, and cycled back into the environment. Three hours rec. a week. Pr.: CHM 110 or 210. ATM-660-0-0998

ATM 670. Private Water Supply and Waste Management. (2) I. Principles of water supply development, pressurized systems, distribution systems, water treatment, and domestic sewage disposal. Two hours rec. a week. Pr.: CHM 110 or 210. ATM-670-0-0998

ATM 702. Topics in Agricultural Technology Management. (1) S. The selection, operational theory, repair, maintenance, adjustment, and application of equipment and materials for agricultural systems. This course will include a series of subjects covering timely topics and may be repeated as needed. Instructional materials, teaching aids and advanced methodology will be developed with respect to the topic. Pr.: ATM 659. ATM-702-1-0998

Graduate credit

ATM 810. Research in Agricultural Technology Management. (Var.) I, II, S. Research problems in agricultural technology management. Pr.: Approval of department head. ATM-810-4-0998

ATM 815. Graduate Seminar in Agricultural Technology Management. (1) I, II. Presentation and discussion of research philosophies, procedures, and results. One hour rec. a week. Required of all graduate students in agricultural technology management. ATM-815-0-0998

ATM 896. Internship. (1-4) I, II, S. Creative technical work at an appropriate educational level with agriculturally related sponsoring industries under faculty supervision. Training projects are selected by mutual agreement among the student, the sponsor, and the student's advisory committee. Pr.: ATM 630, ATM 651, or ATM 653. ATM-896-2-0998

ATM 898. Master's Report. (Credit arranged.) I, II, S. Topics selected with approval of major professor and department head. ATM-898-4-0998

ATM 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. ATM-899-4-0998

Agronomy

(Crops, soils, range management, soil and water conservation)

G. L. Posler,* Acting Head
G. L. Posler,* Assistant Head—Teaching
D. A. Whitney,* Extension State Leader

Professors Barnett,* Kilgore, Kirkham,* Liang,* Owensby,* Paulsen,* Posler,* Sears,* Skidmore,* Stone,* Swallow, Thien,* Vanderlip,* Wassom,* and Whitney;* Associate Professors Armbrust,* Cox,* Ehler,* Fick,* Fjell, Lamond,* Maddux, Mikesell, Moshier,* Ohlenbusch, Regehr,* Schapaugh,* Schwab,* Shroyer, and Walter; Assistant Professors Bramel-Cox,* Brotmarkle, Burchett, Claassen, Cole, Devlin, Greenland, Hagen,* J. Ham, Havlin,* Heer, Janssen, Kluitenberg, Kok, Long, Mosier, Peterson, Pierzynski,* Ransom,* Rice,* and TenEyck; Assistant Agronomist Schaffer; Emeriti: Professors Anderson,* Bidwell,* Bieberly, Bohannon, Casady,* Dicken, Edelblute, Heyne,* Hobbs,* Jones,* Lind, Lyles,* Mader,* Nilson, Russ,* Smith,* Sorenson,* Withee,* and Woodruff;* Associate Professors Atkinson, Harper, and Overley; Assistant Professors Lundquist and Moore; Instructor Dickerson.

Undergraduate study

Bachelor of science in agriculture—
127 semester hours

Agronomy includes crop, soil, and range sciences. Students in agronomy have diverse interests including crop production and physiology; crop breeding; soil management, fertility, and conservation; physical and chemical properties of soils; forages; and range management.

Students majoring in agronomy are required to complete the following basic courses, plus those in the option below that the student selects.

| | | |
|-----------|------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| GENAG 101 | Ag Orientation | 1 |
| MATH 100 | College Algebra | 3 |
| ECON 110 | Economics I | 3 |
| AGRON 220 | Crop Science | 4 |
| AGRON 305 | Soils | 4 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |

AGRON 430. Tropical Agronomy. (2) Intersession. A study of the soils and plant materials of tropical areas and the production of principal crops. Systems of agriculture and problems of agricultural production in tropical regions. Pr.: AGRON 220 or HORT 200 and AGRON 305. AGRON-430-0-0103

AGRON 455. Computer Applications in Agronomy. (3) I, II. Application of computer technology to plant and soil science. Emphasis on use of current software in managing data and knowledge useful to crop production. Three hours lec. a week. Pr.: AGRON 220 and AGRON 305. AGRON-455-0-0102

Undergraduate and graduate credit in minor field

AGRON 501. Range Management. (3) I. Fundamental ecological principles of production, conservation, and use of grasslands. Application of these fundamental principles to range management. Three hours rec. a week. AGRON-501-0-0102

AGRON 515. Soil Genesis and Classification. (3) II. Study of the factors and processes of soil formation, classification of soils according to soil taxonomy, and use of soil survey information. Required field trips. Two hours rec. and three hours lab a week. Pr.: GEOL 100 and AGRON 305 or consent of instructor. AGRON-515-1-0103

AGRON 520. Grain Production. (3) I. An upper-level course for those interested in grain production in the Central Plains. Pest control, limiting factors, and planting factors will be considered in view of climatic conditions and crop plant growth habit. From this, a crop production strategy will be developed for each crop. Pr.: AGRON 220 and AGRON 375. AGRON-520-0-0102

AGRON 550. Forage Management and Utilization. (3) II. Production and utilization of forage crops. Development of forage programs for livestock production, including pasture and stored forages. Three hours rec. a week. Pr.: AGRON 220 and junior standing. AGRON-550-0-0102

AGRON 551. Forage Management and Utilization Laboratory. (1) II. Identification of forage species, techniques for estimating forage quality, forage physiology, and field trips. One two-hour lab a week. Pr.: Completion of or conc. enrollment in AGRON 550. AGRON-551-1-0102

AGRON 560. Field Identification of Range and Pasture Plants. (1) I. Offered fall 1991 and alternate years. Identification of range pasture plants through exposure to them in their natural environment. Pr.: AGRON 220 or BIOL 210 or consent of instructor. AGRON-560-1-0102

AGRON 599. Agronomy—The Profession. (1) II. An overview of opportunities, responsibilities, and challenges for the professional agronomist. Discussion of current topics and important issues in crops and soils, range management, and soil and water resources. Open only to seniors. AGRON-599-0-0102

Undergraduate and graduate credit

AGRON 600. Crop Problems. (Var.) I, II, S. Studies may be chosen in: genetics, crop improvement, forages, ecology, weed control, plant physiology, or crop production. AGRON-600-3-0102

AGRON 615. Soil Problems. (Var.) I, II, S. Studies may be chosen in: chemistry, physics, conservation, fertility, genesis, morphology, or classification. AGRON-615-3-0103

AGRON 630. Principles of Crop Improvement. (3) II. Basic plant breeding techniques used to genetically improve crops for use by man and procedures to increase, distribute, and maintain breeding stocks and varieties. Two lec. and one two-hour lab a week. Pr.: AGRON 220 and ASI 500. AGRON-630-1-0102

AGRON 635. Soil Conservation and Management. (3) I. Principles, mechanics, and prediction of water and wind erosion. Influence of soil erosion on soil productivity and environmental quality. Conservation

management technologies for erosion control and sustaining soil productivity. Legislation and land-use planning for soil conservation. Course requires microcomputer skills. Two hours rec. and 1 three-hour lab a week. Pr.: AGRON 305. AGRON-635-1-0103

AGRON 645. Soil Microbiology. (4) I. The nature and function of soil microorganisms in the soil ecosystem. The role of soil microbial activity to soil organic matter, mineral transformations, plant nutrition, and environmental quality. Three hours rec. and two hours lab a week. Pr.: AGRON 305 or BIOL 455. AGRON-645-1-0103

AGRON 660. Range Research Techniques. (3) I. Offered fall 1990 and alternate years. Discussion of quantitative and qualitative procedures used to study vegetation. Includes application, advantages, and disadvantages of these methods. Use of statistical techniques for sampling, analysis, and presentation of data. Two hours rec. and one three-hour lab a week. Pr.: AGRON 501 and STAT 320. AGRON-660-1-0102

AGRON 670. Range Management Problems. (Var.) I, II, S. AGRON-670-3-0102

AGRON 681. Range Ecology. (3) II. Offered spring 1992 and alternate years. Application of ecological principles to range ecosystem management. Study of plant-soil-animal interactions with rangelands, and discussion of plant succession, environmental influences, and ecological concepts. Two hours rec. a week and one lab credit consisting of field trips to representative range areas. Pr.: AGRON 501 and BIOL 529. AGRON-681-1-0102

AGRON 705. Chemical Properties of Soils. (3) I. A study of soils as a chemical and colloidal system, including their chemical and mineralogical composition and reactions occurring in them. Three hours rec. a week. Pr.: AGRON 305, GEOL 100. AGRON-705-0-0103

AGRON 716. Herbicide Interactions. (3) II. A study of systems and physiological processes in plants and soils as they affect herbicide fate and activity and are affected by herbicides. Research methodology and literature will also be discussed and evaluated. Pr.: AGRON 330 and BIOL 500 or equiv. AGRON-716-0-0102

AGRON 735. Chemical Fertilizers. (3) II. A study of the processes involved in the formulation of chemical fertilizers, the physical and chemical properties of various fertilizer materials, and the technology of fertilizer use. Three hours rec. a week plus a field trip to inspect fertilizer manufacturing facilities. Pr.: AGRON 220, 305, and 375. AGRON-735-0-0103

AGRON 746. Physical Properties of Soils. (3) II. The properties of soils as affected by their physical environment, including water content, temperature, soil structure, and aeration. Two hours rec. and two hours lab a week. Pr.: AGRON 305. AGRON-746-1-0103

AGRON 760. Field Course in Range Management. (2) S. A summer field and lecture course dealing with the principles of range ecology as applied to range management practices; emphasis on field techniques for range plant identification and mensuration, range site evaluation, range condition classification, plant succession, and the impact of various range management practices. Two-week field course given jointly by Kansas State University and Fort Hays State University. Pr.: AGRON 501, BIOL 529. Suitable field experience may be substituted for these prerequisites with consent of instructor. AGRON-760-2-0102

AGRON 762. Range Grasses. (2) I. Offered fall 1990 and alternate years. Field and laboratory study of range and pasture plants, with special emphasis on grasses and their distinguishing characteristics. One hour rec. and two hours lab a week. Pr.: BIOL 198 or 210. AGRON-762-3-0102

AGRON 770. Plant Genetics. (3) I. Concepts and application of basic genetic principles in higher plants. Probability, linkage, chromosome aberrations, aneuploidy analysis, gene transfer in wide crosses, tissue culture and crop improvement, and genetics of disease resistance. Three hours rec. a week. Pr.: ASI 500. AGRON-770-0-0102

AGRON 790. Range Management Planning. (3) II. Offered spring 1991 and alternate years. Inventory and analysis of rangeland resources and development of detailed management plan. Emphasizes range management principles and practices useful in maximizing production from rangelands. Two hours rec. a week and one lab credit including field trips to ranch operations. Pr.: AGRON 501. AGRON-790-1-0102

Graduate credit

AGRON 810. Agronomy Seminar. (1) I, II. A discussion of agronomic developments. Pr.: Graduate standing. AGRON-810-0-0102

AGRON 815. Soil-Root Environment. (2) I. A study of plant roots and the soil influenced by them; with emphasis on their chemical, microbiological, and physical interactions in the rhizosphere. Pr.: AGRON 375 and BIOL 500. AGRON-815-0-0103

AGRON 820. Plant-Water Relations. (3) II. Properties of water, terminology in plant and soil water relations, environmental aspects of plant-water relations, soil as a water reservoir, water as a plant component, water movement through the plant, special aspects of transpiration, development and significance of internal water deficits, drought resistance mechanisms, water consumption by crop plants. Pr.: AGRON 220 and 305, BIOL 500. AGRON-820-0-0102

AGRON 825. Soil and Plant Analysis. (3) I. Offered fall 1991 and alternate years. Theories and procedures for the chemical analysis of soils and plant materials. Applications of analysis in soil fertility evaluations and in research work are discussed. One hour rec. and six hours lab a week. Pr.: AGRON 305, CHM 271. AGRON-825-1-0103

AGRON 830. Quantitative Genetics in Relation to Plant Breeding. (3) I. Offered fall 1991 and alternate years. Application of statistical principles to biological populations in relation to gene and zygotic frequencies, mating systems, and effects of mutation, migration, and selection on equilibrium populations; partitioning of genetic variance, concept and methods of estimating heritability, theoretical basis of heterosis, diallel cross and combining ability, genotype by environment interaction, genetic advance under selection, models on phenotypic expression of various crops; genetics of autopolyploids. Pr.: AGRON 770, STAT 703, 704, and 705 or equiv. AGRON-830-0-0102

AGRON 840. Crop Physiology. (3) II. Offered spring 1991 and alternate years. Principles of nitrogen metabolism, mineral nutrition, photosynthesis, growth substances, and hardness applied to crop production. Three hours rec. a week. Pr.: BIOL 500. AGRON-840-0-0102

AGRON 860. Applied Plant Breeding. (3) II. This course considers in detail the mechanics of an applied plant breeding program for agronomic crops. Pr.: AGRON 630 or HORT 740, AGRON 770, and STAT 703. AGRON-860-0-0102

AGRON 895. Nutrient Cycling Models. (2) I. Offered fall 1991 and alternate years. This course examines several computer simulation models that describe individual nutrient cycling processes and a crop model incorporating several process models. The models examined will deal primarily with cycling of nitrogen and phosphorus. Pr.: AGRON 375 and 705 and one introductory computer programming course. AGRON-895-0-0103

AGRON 898. Master's Report. (2) I, II, S. Preparation of a written report either of research or of problem work on a topic in the major field. AGRON-898-4-0102

AGRON 899. Master's Research. (Var.) I, II, S. Research on a problem which may extend throughout the year and furnish data for a master's thesis. AGRON-899-4-0102

AGRON 905. Soil Physical Chemistry. (3) I. Offered fall 1990 and alternate years. Application of physical chemistry to soils; cation and anion equilibria, cation activities, electrokinetics, sorption, and other physicochemical reactions in soils. Two hours rec. and three hours lab a week. Pr.: AGRON 705, 746, and CHM 585. AGRON-905-1-0103

AGRON 910. Topics in Plant Breeding. (Var.) I, II, S. Discussion and lectures on important papers and contributions in this field. Pr.: Consent of instructor. Joint listing with Department of Horticulture. See HORT 910. AGRON-910-0-0102

AGRON 916. Advanced Soil Physics. (3) II. Offered spring 1991 and alternate years. An advanced study of prominent theories concerning the physical behavior of soils. Three hours rec. a week. Pr.: AGRON 746, MATH 222, PHYS 211. AGRON-916-0-0103

AGRON 920. Agricultural Climatology. (2) II. Offered spring 1992 and alternate years. Concepts and applications of basic atmospheric principles governing the climate near the ground and the interrelationships between the physical environment and living organisms. Includes discussions on the implications of modifying the microclimate by management practices, plant-water relations, and remote sensing. Two hours rec. a week. Pr.: PHYS 193, MATH 222, AGRON 746. AGRON-920-0-0102

AGRON 925. Advanced Soil Genesis and Classification. (2) II. Offered spring 1991 and alternate years. An advanced study of processes of soil formation and systems of soil classification including soil taxonomy. Two hours rec. a week. Pr.: AGRON 515. AGRON-925-0-0103

AGRON 930. Topics in Plant Genetics. (Var.) I, II, S. Discussion and lectures on important papers and contributions in this field. Pr.: Consent of instructor. Joint listing with Department of Horticulture. See HORT 930. AGRON-930-0-0102

AGRON 935. Topics in Soils. (Var.) I, II, S. Discussion and lectures on important papers and contributions in this field. Pr.: Consent of instructor. AGRON-935-0-0103

AGRON 940. Genetic Manipulation of Crop Plants. (3) I. Offered fall 1990 and alternate years. Crop evolution, gene pools and origin of species, genetic distance, use of exotic germplasm, breeding techniques, genome organization in plants, and use of biotechnology in plant breeding. Three hours rec. a week. Pr.: BIOL 540; AGRON 770, 830. AGRON-940-0-0102

AGRON 945. Soil Mineralogy. (4) I. Offered fall 1991 and alternate years. Theory and application of methods for analyzing minerals in soil environments, including x-ray, electron optical, thin section, and wet chemical techniques. Two hours rec. and six hours lab a week. Pr.: AGRON 705. AGRON-945-1-0103

AGRON 950. Advanced Crop Ecology. (3) II. Offered spring 1992 and alternate years. Principles of growth and development of crops in relation to the environment. Three hours rec. a week. Pr.: BIOL 500, 529, and STAT 704, 705. AGRON-950-0-0102

AGRON 960. Topics in Crop Physiology and Ecology. (Var.) I, II, S. Discussion and lectures on important papers and contributions in this field. Pr.: Consent of instructor. AGRON-960-0-0102

AGRON 970. Advanced Plant Breeding. (3) II. Offered spring 1992 and alternate years. Single and multiple trait selection, mating designs, recurrent and single-cycle selection theory, stability analyses, resource allocation theory, breeding for host plant resistance. Pr.: AGRON 785 and AGRON 830. AGRON-970-0-0102

AGRON 999. Ph.D. Research. (Var.) I, II, S. Research on a problem which may extend throughout the year and furnish data for a doctoral dissertation. AGRON-999-4-0102

Animal Sciences and Industry

Jack G. Riley,* Head
Curtis L. Kastner,* Research Coordinator
Larry R. Corah,* State Leader Extension
Miles McKee, Teaching Coordinator

Professors Able,* Adams,* Bolsen,* Brent,* Call, Corah,* Craig,* Cunningham,* Dikeman,* Drake, Dunham, Fung,* Harbers,* Henderson, Hines,* Hunt,* Kastner,* Kiracofe,* Kropf,* McKee, Morrill,* Riley,* Schafer, Schalles,* and Zoellner; Associate Professors Brazle, Davis,* Harmon,* Jeon,* Kuhl, Minton,* Nagaraja,* Nelssen,* Nichols, Roberts, Shirley, Simms,* W. Smith,* Spaeth, and Stevenson;* Assistant Professors Arns, Blasi, Brandt,* Cochran, Frye, Hancock,* Hoover, Houghton, Kreikemeier, Martin, Michaels, Raub,* S. Smith, and Unruh;* Instructors K. E. Anderson, Heikes, W. Jackson, and Lewis; Assistant Instructors K. P. Anderson, Goetsch, Johnson, Mee, Scheele; Emeriti: Professors Bassette, Bonewitz, Claydon, Farmer, Francis, Good, M. Jackson, Kahrs, Koch, McAdams, McCormick, Moyer, Norton, Orwig, Richardson, E. Smith, Ward, and Wheat.

Undergraduate study

Bachelor of science in agriculture—
127 semester hours

Courses in the department give instruction in selection, breeding, feeding, management, and marketing of beef and dairy cattle, horses, poultry, sheep, and swine, as well as instruction in the processing and use of the products these animals and birds provide. Options of study are available in animal products, business, communications, pre-veterinary/science, and production-management.

In addition to classrooms, office space, and laboratories located in Weber and Call Halls, the department maintains several animal and poultry units within easy access to the campus that house the beef and dairy cattle, horses, swine, sheep, and poultry used for teaching and research.

General requirements

| | | |
|-----------|------------------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| GENAG 101 | Ag Orientation | 1 |
| MATH 100 | College Algebra | 3 |
| ECON 110 | Economics I | 3 |
| CHM 210 | Chemistry I | 4 |
| | or | |
| CHM 110 | General Chemistry | 5 |
| PE 101 | Principles of Physical Fitness | 1 |
| BIOL 198 | Principles of Biology | 4 |
| ASI 102 | Principles of Animal Science | 3 |
| ASI 318 | Fundamentals of Nutrition | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| | Humanities and/or social sciences* | 9 |

| | |
|-----------------------|---|
| Communications* | 3 |
| ASI seminar elective* | 1 |

* To be selected from the approved list in consultation with advisor.

Additional courses required for specific options:

Animal products option

| | | |
|-----------|---|-----|
| ASI 302 | Introduction to Food Science | 3 |
| ASI 500 | Genetics | 3 |
| | or | |
| ASI 533 | Anatomy and Physiology | 4 |
| BIOL 455 | Microbiology | 4 |
| CHM 230 | Chemistry II | 4 |
| BIOCH 120 | Introductory Organic and Biological Chemistry | 5 |
| | Agriculture electives | 4-8 |
| | Agricultural economics or business electives | 6 |
| | Mathematics/statistics/computer science electives | 6 |
| ASI 103 | Dairy Science | 1 |
| | or | |
| ASI 104 | Poultry Science | 1 |
| | or | |
| ASI 105 | Animal Sciences and Industry | 1 |
| ASI 311 | Introductory Food Chemistry | 3 |
| ASI 550 | Dairy Bacteriology | 4 |
| ASI 695 | Quality Assurance of Food Products | 3 |

Select 17 hours from the following:

| | | |
|---------|--------------------------------------|---|
| ASI 305 | Fundamentals of Food Processing | 3 |
| ASI 315 | Livestock and Meat Evaluation | 3 |
| ASI 350 | Meat Science | 3 |
| ASI 361 | Meat Processing | 2 |
| ASI 370 | Principles of Meat Evaluation | 2 |
| ASI 405 | Fundamentals of Milk Processing | 3 |
| ASI 430 | Food Products Evaluation | 3 |
| ASI 502 | Principles of Dairy Foods Processing | 4 |
| ASI 599 | Animal Science Internship/Meats | 2 |
| ASI 630 | Egg Science | 2 |
| ASI 635 | Poultry Meat Technology | 2 |
| ASI 694 | Food Plant Management | 2 |
| ASI 777 | Meat Technology | 4 |

Select one of the following:

| | | |
|---------|-------------------------|---|
| ASI 515 | Beef Science | 3 |
| ASI 524 | Sheep Science | 3 |
| ASI 535 | Swine Science | 3 |
| ASI 621 | Dairy Cattle Management | 3 |
| ASI 645 | Poultry Management | 3 |

Business option

| | | |
|-----------|--|------|
| AGEC 100 | Agricultural Economics and Agribusiness | 3 |
| ASI 500 | Genetics | 3 |
| ASI 533 | Anatomy and Physiology | 4 |
| ACCTG 221 | Managerial Accounting | 3 |
| | Agriculture electives | 6-12 |
| | Business electives | 6 |
| | Agricultural economics electives | 12 |
| | Mathematics/statistics/computer science elective | 3 |
| ASI 103 | Dairy Science | 1 |
| | or | |
| ASI 104 | Poultry Science | 1 |
| | or | |
| ASI 105 | Animal Sciences and Industry | 1 |
| ASI 320 | Principles of Feeding | 3 |
| ASI 400 | Farm Animal Reproduction | 4 |

Select one of the following:

| | | |
|---------|-----------------|---|
| ASI 350 | Meat Science | 3 |
| ASI 361 | Meat Processing | 2 |
| ASI 601 | Milk Secretion* | 3 |
| ASI 630 | Egg Science** | 2 |

Select one of the following:

| | | |
|---------|---|---|
| ASI 315 | Livestock and Meat Evaluation | 3 |
| ASI 405 | Fundamentals of Milk Processing* | 3 |
| ASI 502 | Fundamentals of Dairy Foods Processing* | 4 |
| ASI 550 | Dairy Bacteriology* | 4 |
| ASI 635 | Poultry Meat Technology** | 2 |

Select two of the following:

| | | |
|---------|--------------------------|---|
| ASI 515 | Beef Science | 3 |
| ASI 521 | Horse Science | 3 |
| ASI 524 | Sheep Science | 3 |
| ASI 535 | Swine Science | 3 |
| ASI 621 | Dairy Cattle Management* | 3 |
| ASI 645 | Poultry Management** | 3 |

Required for dairy students*:

| | | |
|---------|----------------------------|---|
| ASI 396 | Dairy Cattle Judging | 2 |
| ASI 510 | Animal Breeding Principles | 3 |
| ASI 609 | Dairy Cattle Nutrition | 2 |

Required for poultry students**:

| | | |
|---------|-----------------------------|---|
| ASI 310 | Poultry Judging | 2 |
| ASI 614 | Swine and Poultry Nutrition | 2 |

Communications option

| | | |
|--|-------------------------------------|------|
| ASI 500 | Genetics | 3 |
| ASI 533 | Anatomy and Physiology | 4 |
| Agriculture electives | | 8-16 |
| Agricultural economics or business elective | | 3 |
| Mathematics/statistics/computer science elective | | 3 |
| JMC 235 | Introduction to Mass Communications | 3 |
| JMC 275 | News and Feature Writing | 3 |
| JMC 300 | Editing and Design | 3 |
| JMC 380 | Advanced News and Feature Writing | 3 |
| JMC 665 | Law of Mass Communications | 3 |
| RTV 300 | Radio-Television and Society | 3 |
| Communications electives | | 6 |
| ASI 103 | Dairy Science | 1 |
| or | | |
| ASI 104 | Poultry Science | 1 |
| or | | |
| ASI 105 | Animal Sciences and Industry | 1 |
| ASI 300 | Principles of Livestock Feeding | 3 |
| ASI 400 | Farm Animal Reproduction | 4 |

Select one of the following:

| | | |
|---------|-----------------|---|
| ASI 350 | Meat Science | 3 |
| ASI 361 | Meat Processing | 2 |
| ASI 601 | Milk Secretion | 3 |
| ASI 630 | Egg Science | 2 |

Select one of the following:

| | | |
|---------|---------------------------------|---|
| ASI 315 | Livestock and Meat Evaluation | 3 |
| ASI 405 | Fundamentals of Milk Processing | 3 |
| ASI 550 | Dairy Bacteriology | 4 |
| ASI 635 | Poultry Meat Technology | 2 |

Select one of the following:

| | | |
|---------|--|---|
| ASI 510 | Animal Breeding Principles | 3 |
| ASI 655 | Behavior of Domestic Animals | 3 |
| ASI 735 | Environmental Physiology of Farm Animals | 3 |

Select two of the following:

| | | |
|---------|-------------------------|---|
| ASI 515 | Beef Science | 3 |
| ASI 521 | Horse Science | 3 |
| ASI 524 | Sheep Science | 3 |
| ASI 535 | Swine Science | 3 |
| ASI 621 | Dairy Cattle Management | 3 |
| ASI 645 | Poultry Management | 3 |

Pre-veterinary/science option

| | | |
|---|--------------------------------------|---|
| ASI 103 | Dairy Science | 1 |
| ASI 104 | Poultry Science | 1 |
| ASI 105 | Animal Sciences and Industry | 1 |
| ASI 320 | Principles of Feeding | 3 |
| ASI 400 | Farm Animal Reproduction | 4 |
| Agriculture electives | | 9 |
| Agricultural economics or business elective | | 3 |
| Select 7 hours from the following: | | |
| ASI 500 | Genetics | 3 |
| ASI 533 | Anatomy and Physiology | 4 |
| BIOL 510 | Embryology | 4 |
| BIOL 455 | Microbiology | 4 |
| Select 12 hours from the following: | | |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| BIOCH 201 | Elementary Biochemistry | 3 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Laboratory | 2 |

Select two of the following:

| | | |
|----------|-------------------------------------|---|
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| STAT 340 | Biometrics I | 3 |
| MATH 205 | General Calculus and Linear Algebra | 3 |
| MATH 210 | Technical Calculus I | 3 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |

Select one of the following:

| | | |
|---------|-----------------|---|
| ASI 350 | Meat Science | 3 |
| ASI 361 | Meat Processing | 2 |
| ASI 601 | Milk Secretion | 3 |
| ASI 630 | Egg Science | 2 |

Select one of the following:

| | | |
|---------|---------------------------------|---|
| ASI 315 | Livestock and Meat Evaluation | 3 |
| ASI 405 | Fundamentals of Milk Processing | 3 |
| ASI 550 | Dairy Bacteriology | 4 |
| ASI 635 | Poultry Meat Technology | 2 |

Select one of the following:

| | | |
|---------|--|---|
| ASI 510 | Animal Breeding Principles | 3 |
| ASI 655 | Behavior of Domestic Animals | 3 |
| ASI 735 | Environmental Physiology of Farm Animals | 3 |

Select two of the following:

| | | |
|---------|-------------------------|---|
| ASI 515 | Beef Science | 3 |
| ASI 521 | Horse Science | 3 |
| ASI 524 | Sheep Science | 3 |
| ASI 535 | Swine Science | 3 |
| ASI 621 | Dairy Cattle Management | 3 |
| ASI 645 | Poultry Management | 3 |

Production-management option

| | | |
|--|---|------|
| AGEC 100 | Agricultural Economics and Agribusiness | 3 |
| ASI 500 | Genetics | 3 |
| ASI 533 | Anatomy and Physiology | 4 |
| BIOCH 120 | Introductory Organic and Biological Chemistry | 5 |
| Agriculture electives | | 6-12 |
| Agricultural economics or business electives | | 12 |
| Mathematics/statistics/computer science elective | | 3 |
| ASI 103 | Dairy Science | 1 |
| or | | |
| ASI 104 | Poultry Science | 1 |
| or | | |
| ASI 105 | Animal Sciences and Industry | 1 |
| ASI 320 | Principles of Feeding | 3 |
| ASI 400 | Farm Animal Reproduction | 4 |
| ASI 510 | Animal Breeding Principles | 3 |

Select one of the following:

| | | |
|---------|-----------------|---|
| ASI 350 | Meat Science | 3 |
| ASI 361 | Meat Processing | 2 |
| ASI 601 | Milk Secretion* | 3 |
| ASI 630 | Egg Science** | 2 |

Select one of the following:

| | | |
|---------|---------------------------------------|---|
| ASI 315 | Livestock and Meat Evaluation | 3 |
| ASI 405 | Fundamentals of Milk Processing* | 3 |
| ASI 502 | Principles of Dairy Foods Processing* | 4 |
| ASI 550 | Dairy Bacteriology* | 4 |
| ASI 635 | Poultry Meat Technology** | 2 |

Select three of the following:

| | | |
|---------|------------------------------|---|
| ASI 515 | Beef Science | 3 |
| ASI 521 | Horse Science | 3 |
| ASI 524 | Sheep Science | 3 |
| ASI 535 | Swine Science | 3 |
| ASI 621 | Dairy Cattle Management* | 3 |
| ASI 645 | Poultry Management** | 3 |
| ASI 655 | Behavior of Domestic Animals | 3 |

Required for dairy students*:

| | | |
|---------|------------------------|---|
| ASI 396 | Dairy Cattle Judging | 2 |
| ASI 609 | Dairy Cattle Nutrition | 2 |

Required for poultry students**:

| | | |
|---------|-----------------------------|---|
| ASI 310 | Poultry Judging | 2 |
| ASI 614 | Swine and Poultry Nutrition | 2 |

*For students pursuing dairy interest

**For students pursuing poultry interest

Graduate study

Graduate study leading to the M.S. and Ph.D. degrees in animal sciences is offered in the fields of animal breeding, animal production and management, animal products, animal reproduction, animal nutrition, and genetics. Prerequisites to major graduate work in these fields are completion of a four-year curriculum substantially equivalent to that required of undergraduate students majoring in animal sciences and industry and acceptance by the department and the Graduate School.

Undergraduate credit

ASI 061. Concepts and Practices in Animal Science. (1-3) I, II, S. Individual work in the various fields of study available in animal sciences and industry. ASI-061-3-0104

ASI 102. Principles of Animal Science. (3) I, II. Basic principles which apply to animal agriculture; survey of the industry; types, purposes, and products of livestock; principles of breeding, selection, nutrition, lactation, reproduction, management, and marketing. Three hours rec. a week. ASI 103, 104, and 105 are companion courses. ASI-102-0-0104

ASI 103. Dairy Science. (1) I, II. Application of basic principles of animal agriculture to dairying. Two hours lab a week. Pr.: ASI 102 or conc. enrollment. ASI-103-1-0105

ASI 104. Poultry Science. (1) I, II. Application of basic principles of animal agriculture to the poultry industry. Two hours lab a week. Pr.: ASI 102 or conc. enrollment. ASI-104-1-0106

ASI 105. Animal Sciences and Industry. (1) I, II. A study of the breeding and market types and classes of livestock including a comparison of the live animal and carcass evaluation. Two hours lab a week. Pr.: ASI 102 or conc. enrollment. ASI-105-1-0104

ASI 110. Bovine Artificial Insemination. (1) On sufficient demand. Designed to make student proficient in artificially inseminating the cow. ASI-110-1-0104

ASI 235. Principles of Animal Disease Control. (3) II. A study of the factors that influence animal health and disease control. For students majoring in agriculture and other fields. Three hours lec. a week. Pr.: ASI 102, ASI 533, and sophomore standing. Same as SM 235. ASI-235-0-0104

ASI 300. Principles of Livestock Feeding. (3) II. Practical application of nutritional principles to the feeding of livestock; feedstuff evaluation; nutritive requirements; basic ration formulation and evaluation. Not open to ASI majors other than communication option. Student cannot apply credit for both ASI 300 and 320 toward a B.S. degree. Pr.: CHM 110 or equiv. ASI-300-0-0104

ASI 301. Farrier Science. (2) II. Application of farrier's principles and practices. The anatomy and physiology of the lower leg and hoof are thoroughly studied and basic static and dynamic biomechanics of the horse are addressed. Corrective, therapeutic and performance, and specific shoeing and trimming techniques are practiced. One hour lecture and four hours lab a week. Pr.: Consent of instructor. ASI-301-1-0104

ASI 302. Introduction to Food Science. (3) I, II. This course is the beginning course in food science designed to acquaint the student with the breadth and scope of the food industry and the role of science in the preservation, processing, and utilization of foods. Three hours lec. a week. ASI-302-0-0101

ASI 305. Fundamentals of Food Processing. (3) II. The study of some basic ingredients used in food processing, principles of preserving and processing of foods, and food packaging. Food science and industry majors should take before the senior year. Taught in cooperation with the Departments of Horticulture, and Grain Science and Industry. Pr.: A course in chemistry. ASI-305-0-0104

ASI 310. Poultry and Poultry Product Evaluation. (2) I, in even years. Apply knowledge of physical and anatomical characteristics for evaluating poultry for egg and meat production. Evaluation of ready-to-cook poultry products as well as eggs on their exterior, interior, and broken-out appearance according to the latest USDA standards. Two two-hour labs a week. Pr.: ASI 104. ASI-310-1-0106

ASI 315. Livestock and Meat Evaluation. (3) I, II. Evaluation of slaughter livestock and their carcasses as related to economically efficient production of red meat. Evaluation of breeding livestock on visual appraisal and performance records. A study of growth and the effects of nutrition, environment, and hormones on growth patterns. Breeds of livestock and performance programs will be studied. One hour lec. and four hours lab a week. Pr.: ASI 102 and 105; or consent of instructor. ASI-315-1-0104

ASI 318. Fundamentals of Nutrition. (3) I, II. Elementary principles of comparative nutrition of farm animals. Three hours rec. a week. Pr.: BIOCH 120 or CHM 350. ASI-318-0-0104

ASI 320. Principles of Feeding. (3) I, II. Application of basic nutrition principles to the feeding of beef cattle, sheep, and swine; feedstuff evaluation; nutrient requirements; ration formulation and practical feeding problems. Two hours rec. and two hours lab a week. Pr.: ASI 318. ASI-320-0-0104

ASI 325. Aptitude and Performance Appraisal of Horses. (2) II. Evaluation of athletic performance capabilities of horses including influence of heredity, and conformation, training, and other environmental effects; use of records and visual appraisal for selection; industry trends in breeding and showing; oral and written defense of judgments. Four hours of lab a week. Pr.: ASI 105. ASI-325-1-0104

ASI 340. Principles of Meat Science. (2) I, II, S. An overview of the meat industry for off-campus students using a videotaped format. Food science and animal science majors cannot substitute this course for ASI 350. Pr.: A course in biology is recommended. ASI-340-0-0104

ASI 350. Meat Science. (3) I, II. An introduction to the red meat industry relating the fundamental properties of muscle structure, chemistry, and physiology to meat quality, composition, processing, nutritional value, and marketing. The laboratory will demonstrate the conversion of animals to meat and by-products, and meat processing technology. Two hours lec. and two hours lab a week. Pr.: BIOL 198. ASI-350-0-0104

ASI 361. Meat Processing. (2) I, II. A student participation course in processing live animals into meat and by-products. Interrelates all phases of modern slaughter techniques, inspection, and related operations. Pr.: ASI 350. ASI-361-1-0104

ASI 370. Principles of Meat Evaluation. (2) I. The use of subjective and objective standards to evaluate beef, lamb, and pork carcasses and wholesale cuts for both quality and yield of edible portion as they relate to value and consumer acceptance. ASI-370-1-0104

ASI 385. Wool Grading and Evaluation. (1) I. A study of factors determining the commercial grades of wool and the desired fleece qualities of sheep, practice in judging and grading wool. Three hours lab a week. Pr.: ASI 102. ASI-385-1-0104

ASI 395. Classification, Grading, and Selection of Meats. (2) I. Advanced study in the evaluation and classification of carcasses and wholesale cuts of beef, lamb, and pork. Application of grade standards to beef, lamb, and pork carcasses. Three hours lab a week. Pr.: ASI 370. ASI-395-1-0104

ASI 396. Dairy Cattle Judging. (2) II. An introduction to the principles of evaluating dairy cattle on the basis of their physical characteristics. Interpretation of the official dairy cow unified score card. Training includes preparation and presentation of oral defense on one's placing of four cow classes. Pr.: ASI 102 and 103. ASI-396-1-0104

ASI 399. ASI Quadrathlon. (1) II. Active participation in the ASI Quadrathlon involving oral presentations, written exams, practical application of animal knowledge, and a quiz bowl. Fifteen hours for presentations will be designated each spring. No more than 2 credits earned in this course may apply towards graduation. ASI-399-2-0104

ASI 400. Farm Animal Reproduction. (4) I. Basic reproductive anatomy and physiology of cattle, horses, pigs, poultry, and sheep during the first half of the semester provides a solid basis for reproduction management topics which occupy the second half of the course. Three hours rec. and three hours lab a week. Pr.: ASI 102. ASI-400-0-0104

ASI 405. Fundamentals of Milk Processing. (3) II, in odd years. A study of fundamentals of processing, quality assurance, inspection, and marketing of fluid milk and related products in a modern market milk enterprise. Two hours lec. and one three-hour lab a week. Pr.: One course in microbiology. ASI-405-1-0105

ASI 411. Introductory Food Chemistry. (3) II. The basic composition, structure, and properties of foods and the chemistry of changes occurring during processing, storage, and utilization. Two hours lec. and three hours lab a week. Pr.: BIOCH 120 or 201. ASI-411-1-0105.

ASI 420. Advanced Dairy Cattle Judging. (1) I. Three hours lab a week. Pr.: ASI 396. ASI-420-1-0105

ASI 422. Livestock Sales Management. (1) On sufficient demand. Hands-on experience in the planning, promotion, and production of a purebred livestock sale. Pr.: Junior standing. ASI-422-1-0104

ASI 425. Horse Training and Management. (2) I. Inherited and learned behavior and psychological aspects of behavior modifications used in training horses. Emphasis on application of actual training techniques for training young horses and teaching advanced maneuvers to older horses. Modern management practices which allow maximum efficiency in training. One hour lec. and three hours lab a week. Pr.: ASI 325. ASI-425-1-0104

ASI 430. Food Products Evaluation. (3) II. Fundamentals of sensory evaluation of dairy, poultry products, meat, and other agricultural food products. Study of taste, smell, texture, visual appearance, and other senses related to organoleptic examination and its application to the food processing industry. Introduction to sensory testing methods, including sampling techniques and test forms. Two hours lec. and two hours lab a week. Pr.: ASI 302. ASI-430-0-0105

ASI 450. Principles of Livestock Selection. (2) I. Origin, development, characteristics, and adaptation of different breeds of livestock, with special emphasis on the selection of market and breeding animals. Four hours lab a week. Pr.: ASI 315. ASI-450-1-0104

ASI 470. Form and Function in Livestock. (2) I. A detailed study of animal form and type; influence of type upon function; special training in presenting orally the relative merits of animals of all breeds. Pr.: ASI 450. ASI-470-1-0104

ASI 490. Microcomputer Applications in Animal Sciences and Industry. (3), I, II. Applications of microcomputer techniques to the solutions of problems in animal science and related food industries. Includes use of existing software packages for breakeven analysis, animal identification and health records, feed ration analysis, farm/ranch accounting, and electronic communication with agriculture computer services. Current trends in farm computer use (hardware and software) will also be covered. Two hours lec. and two hours lab a week. Pr.: Junior standing. ASI-490-1-0104

Undergraduate and graduate credit in minor field

ASI 500. Genetics. (3) I, II, S. Variation, Mendelian inheritance, and related subjects. Three hours lec. a week. Pr.: BIOL 198 or 210. ASI-500-0-0104

ASI 502. Principles of Dairy Foods Processing. (4) II, in even years. The application of chemical, microbiological, and physical principles to the conversion of milk into concentrated and dry milk products, hard and soft cheeses, frozen desserts, and butter. Three hours lec. and one three-hour lab a week. Pr.: A course in microbiology and ASI 411. ASI-502-0-0105

ASI 503. Topics in Comparative Pathology. (1-3) I, II, S. Selected topics in diseases of laboratory animals, wildlife, and fish for non-veterinary students. Pr.: BIOL 198. Same as AP 500. ASI-503-1-0104

ASI 504. Equine Reproduction Management. (2) II. Theory and practice in reproductive management and breeding techniques of the horse. Includes basic reproductive physiology of the stallion and mare, demonstration and practice in semen collection and processing, teasing systems, natural and artificial breeding techniques, management, and record keeping. Six hours lab a week. Pr.: ASI 400 and senior standing. ASI-504-1-0104

ASI 510. Animal Breeding Principles. (3) I, II. The genetic principles in evaluation, selection, and mating systems used in beef, dairy, sheep, swine, poultry, and horse breeding. Intended for ASI majors. Three hours lec. a week. Pr.: ASI 500. ASI-510-0-0104

ASI 512. Gestation of Farm Animals. (2) I. A detailed study of gestation using the bovine as a model. Lecture covers factors affecting the physiological events of gestation and management of the pregnant animal. The laboratory provides practical training in following the development of the bovine fetus in utero. Pr.: Senior standing and consent of instructor. ASI-512-1-0104

ASI 515. Beef Science. (3) I, II. A comprehensive course covering all phases of the beef cattle industry. Practical application of nutrition, breeding, physiology of reproduction, risk management, merchandising, and related areas. Special emphasis on management systems of raising, growing, and finishing beef cattle. Pr.: Senior standing. ASI-515-0-0104

ASI 521. Horse Science. (3) II. A study of the light horse industry in the U.S., structure, types and breeds of horses, selection, nutrition, management, performance, breeding, and health. Three hours lec. a week. Pr.: ASI 318. ASI-521-0-0104

ASI 524. Sheep Science. (3) I. Application of scientific management principles to the sheep industry. Breeding, reproduction, nutrition, health, facilities, and economic aspects as related to sheep production. Two hours lec. and two hours lab a week. Pr.: Junior standing. ASI-524-0-0104

ASI 533. Anatomy and Physiology. (4) II. General anatomy and physiology of the domestic animals. Three hours rec. and three hours lab a week. Same as AP 530. ASI-533-0-0104

ASI 534. Introduction to Pharmacology of Farm Animals. (2) II, in even years. The study of the basic principles of pharmacology as related to the proper and safe use of drugs and chemicals by the livestock industry. Same as AP 531. ASI-534-0-0104

ASI 535. Swine Science. (3) I, II. Application of basic scientific principles to the economical production of pork. Recommendations are made in breeding, reproduction, nutrition, health, housing, marketing, and management of swine production units of varying sizes. Two hours lec. and two hours lab a week. Pr.: Senior standing. ASI-535-0-0104

ASI 545. Range Livestock Nutrition and Management. (2) II. A detailed study of nutritional and management concepts relevant to range livestock production. Emphasis will be directed toward discussion of range forage quality, range forage intake, nutrient requirements of range livestock, supplementation systems, grazing systems, computer-aided management procedures, stocking rates, and reproductive management. Two hours lec. a week. ASI-545-0-0104

ASI 550. Dairy Bacteriology. (4) I. Application of the principles of bacteriology to the production and processing of quality milk and dairy products. Consideration of the general characteristics of microorganisms in dairy products. Relationships of bacteria in milk to public health. Two hours lec. and two two-hour labs a week. Pr.: BIOCH 120 or equiv. ASI-550-1-0105

ASI 580. Animal Sciences and Industry Seminar. (1) I. Open only to senior students majoring in animal sciences and industry. One hour rec. a week. ASI-580-0-0104

ASI 581. Dairy Seminar. (1) II. Study of dairy periodicals, bulletins, literature, and current research. Written and oral presentation of information on a dairy topic will be required of all students. One hour rec. a week. Pr.: Junior standing in dairy production. ASI-581-0-0105

ASI 599. Animal Science Internship. (1-6) I, S. Industry work-study experiences in beef cattle, sheep, dairy cattle, swine, horse, or poultry production operations or in animal food products plants. Pr.: Permission of supervising faculty member. ASI-599-2-0104

Undergraduate and graduate credit

ASI 601. Milk Secretion. (3) I. Anatomy and histology of the mammary gland. Physiology of lactation, milk constituents, and management practices that alter quality and quantity. Contemporary milking practices and mastitis control. Two hours lec. and two hours lab a week. Pr.: ASI 103, 318, and 533. ASI-601-0-0105

ASI 605. Fresh Meat Operations. (3) I. Provides information and exposure to fresh meat operations, including: fabrication, yields, costs, quality assurance, packaging, marketing of fresh meat and by-products. Two hours lec. and three hours lab a week. Pr.: ASI 350. ASI-605-1-0104

ASI 606. Instrumental Analysis of Food and Agricultural Products. (2) Spring intersession. A two-week course presenting modern instrumental methods currently available for analysis of food and agricultural products. Pr.: PHYS 115 and BIOCH 201. ASI-606-1-0113

ASI 607. Food Microbiology. (4) I. This course deals with the identification, enumeration, and characterization of bacteria, yeast, and mold associated with foods and food processing. Effects of physical and chemical agents on microorganisms will be studied. Microbiological problems in food spoilage, food preservation, food fermentation, and food-borne diseases will be discussed. Two hours lec. and two two-hour labs a week. Pr.: BIOL 455. ASI-607-1-0113.

ASI 609. Dairy Cattle Nutrition. (2) I. Application of principles of nutrition to feeding dairy cattle; least cost formulation of balanced rations; discussion of current dairy cattle nutrition research. One hour lec. and two hours lab a week. Pr.: ASI 320. ASI-609-1-0104

ASI 610. Processed Meat Operations. (2) II. An intensive course in processed meats, relating the science, technology, and quality control of curing, smoking, and sausage manufacture. One hour rec. and two hours lab a week. Pr.: ASI 350. ASI-610-1-0104

ASI 611. Beef Cattle and Sheep Nutrition. (2) II. A detailed study of the nutrient requirements of beef cattle and sheep for various stages of growth, reproduction, and lactation. Emphasis will be given to interrelationships between nutrition, disease, management, and environment. Diets will be formulated using a wide range of feed ingredients to produce optimum production at minimum cost. Current beef cattle and sheep nutrition research will also be reviewed. One hour lec. and two hours lab a week. Pr.: ASI 320. ASI-611-1-0104

ASI 612. Horse Nutrition. (2) I. A detailed study of the nutrient requirements of horses for various stages of growth, work, reproduction, and lactation. Ration formulation using various feed ingredients. Relationships among nutrition, feed-related diseases, environment, and management. Review of current horse

nutrition research. One hour lec. and two hours lab a week. Pr.: ASI 320. ASI-612-1-0104

ASI 614. Swine and Poultry Nutrition. (2) I. A detailed study of nutrient requirements of swine and poultry, for various stages of production. Lectures will include interrelationships between nutrition and other factors (environment, management, and disease) that affect performance. Labs will emphasize evaluation of feed ingredients, diets, premixes, and base mixes. One hour lec. and two hours lab a week. Pr.: ASI 320. ASI-614-1-0104

ASI 620. Livestock Production and Management. (2) II. Student involvement in laboratory exercises related to practical livestock production and management. One hour rec. and four hours lab a week. Pr.: Appropriate ASI course (515, 521, 525, or 535). ASI-640-2-0104

ASI 621. Dairy Cattle Management. (3) II. Integration of agronomic, biologic, and economic aspects of dairying with dairy farm layout, planning, operation, and analysis. A field study trip and a dairy farm analysis report are required. Two hours rec. and two hours lab a week. Pr.: ASI 102 and 103 and senior standing. ASI-621-0-0105

ASI 630. Egg Science. (2) I, in even years. Emphasis on the technical problems in processing and distribution of shell eggs and egg products. This course covers the chemistry and microbiology of shell eggs and egg products. Processing operations and basic principles of quality assurance are covered. Importance of new product development is discussed. Pr.: ASI 104 and 302. ASI-630-0-0106

ASI 635. Poultry Meat Technology. (2) II, in odd years. Emphasis on the many technical problems that exist between production and consumption during the processing and marketing of poultry meat and poultry meat products. Two hours lec. a week. Pr.: ASI 104 and 302. ASI-635-0-0106

ASI 645. Poultry Management. (3) II, in odd years. A detailed study of the production and management practices involved in commercial poultry and game bird enterprises. Two hours rec. and one three-hour lab a week. Pr.: ASI 102, 104, and junior standing. ASI-645-1-0106

ASI 655. Behavior of Domestic Animals. (3) I. Behavior associated with domestication. Effects of selective breeding, physical and social environments, and developmental stage on social organization, aggressive behavior, sexual behavior, productivity, and training of domestic animals. Physiology of behavior and abnormal behavior considered briefly. Pr.: BIOL 198. ASI-655-0-0106

ASI 661. Animal Sciences and Industry Problems. (1-3) I, II, S. Work offered in: animal breeding, animal nutrition, beef cattle production, dairy production, horse production, livestock evaluation, meats, poultry, sheep production, swine production. Pr.: Consent of instructor. ASI-661-3-0104

ASI 671. Meat Selection and Utilization. (2) I. Emphasis on meat cut selection criteria and identification, grades, fabricated meat, institutional cuts, specification writing, preservation, and meat preparation. One hour lec.-rec. and two hours lab a week. Pr.: FN 300 or 501, or HRIMD 320 or 440. ASI-671-0-0104

ASI 694. Food Plant Management. (2) I. A study of business management practices involved in a food plant operation; organization, plant operations, personnel, production control, purchasing, cost control, sales, and legal aspects of a food operation. Pr.: Junior standing. ASI-694-0-0105

ASI 695. Quality Assurance of Food Products. (3) I. The role of the control laboratory in maintaining standards and quality of dairy and food products and ingredients. Tests and techniques for evaluating quality and sanitation and for compliance with regulatory requirements. Two hours rec. and one three-hour lab a week. Pr.: One course in bacteriology. ASI-695-1-0105

ASI 700. Animal Nutrition. (3) II. The course focuses on the structure and function of the gastrointestinal tract, with an emphasis on the small intestine. Details of gastrointestinal tract secretion, its regulation, digestion, and absorption of the major nutrient groups are emphasized with species comparisons. Three hours rec. a week. Pr.: BIOCH 521 or equiv. ASI-700-0-0104

ASI 702. Animal Nutrition and Diet Formulation. (2) I. Application of basic nutrition principles, diet formulation, and diet adequacy for livestock, poultry, pets, and exotic animals. Includes practical feeding problems encountered by producers and veterinarians. Pr.: ASI 318 and first-year standing in the College of Veterinary Medicine. ASI-702-0-0104

ASI 710. Physiology of Reproduction in Farm Animals. (2) I. This course offers an in-depth study of the anatomical and physiological aspects of reproduction in farm and laboratory animals including endocrine interrelationships controlling reproductive cycles and gamete production. Literature studies and periodic laboratories deal with experimental techniques used in animal reproduction and contemporary animal production practices. One hour lec. and two hours lab a week. Pr.: ASI 400. ASI-710-1-0104

ASI 713. Rapid Methods and Automation in Microbiology. (2) Spring intersession. Rapid methods and automation is a dynamic area in applied microbiology dealing with the study of improved methods in the isolation, detection, characterization, and enumeration of microorganisms and their products in clinical, food, industrial, and environmental samples. The knowledge and techniques of this course are useful for students interested in medical, food, industrial, and environmental microbiology for early detection of beneficial as well as harmful microorganisms in their work. ASI-713-1-0113

ASI 715. Chemistry of Foods. (3) I. Relationship of chemical composition to properties and to physical and chemical stability of foods. Special attention will be given to dairy and poultry products, red meats, vegetables, and cereal grains. Pr.: BIOCH 521, 522. ASI-715-0-0105

ASI 725. Food Analysis. (3) I. Principles, methods, and techniques necessary for quantitative, physical, and chemical analyses of food and food products. The analyses will be related to standards and regulations for food processing. Two hours lec. and three hours lab a week. Pr.: ASI 411. ASI-725-1-0105

ASI 735. Environmental Physiology of Farm Animals. (3) II. A detailed study of the effects of the environment on animal physiology and performance efficiency. Three hours lec. a week with frequent laboratory demonstrations. Pr.: AP 530. ASI-735-0-0104

ASI 749. Advanced Animal Breeding. (3) II. Application of genetic principles to livestock improvement, selection methods, mating systems, heritability estimates, and methods of analyzing genetic data. Three hours lec. a week. Pr.: ASI 500 and three hours in statistics. ASI-749-0-0104

ASI 750. Poultry Seminar. (1) I, in even years. Required of all students majoring in poultry science. Also required of graduate students. One hour rec. or conference a week. Pr.: ASI 102 and 104. ASI-750-0-0106

ASI 777. Meat Technology. (4) II. Meat composition, meat product safety and spoilage, quality assurance, meat processing techniques, sausage and formed products, color, packaging, plant planning and organization, field trip. Three hours lec. and three hours lab a week. Pr.: ASI 350 and 361; senior or graduate standing. ASI-777-0-0104

ASI 799. Graduate Internship in Animal Sciences and Industry. (1-4) I, S. In-depth work-study experiences in beef cattle, sheep, dairy cattle, swine, horse, or poultry production operations or in animal food products plants. Pr.: Permission of supervising faculty member. ASI-799-2-0104

Graduate credit

ASI 800. Topics in Animal Reproduction. (1) II. This is a seminar that involves both oral and written reporting of current literature in reproductive physiology. One hour rec. a week. Pr.: ASI 400. ASI-800-0-0104

ASI 801. Hormonal Control of Reproduction, Lactation, and Growth. (3) I, in even years. Basic study of endocrine glands and their hormone secretions that control reproduction, lactation, and growth in farm animals. Three hours rec. a week. Pr.: BIOCH 521. ASI-801-0-0104

ASI 802. Gametes, Fertilization, and Pregnancy in Farm Animals. (2) I, in odd years. A basic study of underlying mechanisms of gamete production and fertilization, embryonic and fetal development, and the establishment, maintenance, and termination (abortion or parturition) of pregnancy. Emphasis will be on current theories and the research techniques required for testing their validity. One hour rec. and three hours lab a week. Pr.: BIOCH 521. ASI-802-1-0104

ASI 806. Topics in Meat Science and Muscle Biology. (2) II. Seminar and discussion involving written and oral analyses of classical and current literature in meat science and muscle biology. Two hours rec. a week. Pr.: One course in meat science or muscle biology and BIOCH 521. ASI-806-0-0104

ASI 811. Food Fermentation. (4) II. Application of the principles of microbiology to the understanding of the fermentation of various categories of foods. Chemical, biochemical, and microbiological changes under controlled and uncontrolled conditions. Two hours lec. and six hours lab a week. Pr.: BIOCH 201 and BIOL 455. ASI-811-1-0105.

ASI 820. Rumen Metabolism. (3) I. Metabolism, absorption, digestion, and passage of nutrients in the rumen; factors affecting the environment of the rumen; certain aspects of rumen function and dysfunction; techniques used in rumen research. Three one-hour lec. a week. Pr.: ASI 318; BIOCH 521 or 755. ASI-820-0-0105

ASI 825. Rumen Microbiology. (3) II. Two hours lec. and two hours lab a week dealing with the diverse kinds of microorganisms of the rumen of cattle and sheep; classification structural features of bacteria, protozoa, and fungi; microbial metabolism of carbohydrates, nitrogen, and lipids; methane bacteria and methanogenesis. Pr.: BIOL 455. ASI-825-1-0411

ASI 830. Silage Technology. (2) I. A study of silage fermentation, nutrient conservation, aerobic deterioration processes; factors affecting silage quality; and chemical analyses used to evaluate silage. Discussion of techniques used in silage research and assigned readings within the silage literature. Two hours lec. a week. Pr.: BIOCH 521. ASI-830-0-0104

ASI 840. Techniques in Domestic Animal Behavior. (2) On sufficient demand. A combined seminar and laboratory. Current and classical studies reported and discussed, relationships between behavior and other disciplines explored, and methods of data collection examined. Small-scale demonstration experiments planned, executed, and reported orally and/or in scientific written style. One hour rec. and two hours lab a week. Pr.: ASI 655 and STAT 320. ASI-840-1-0104

ASI 850. Analytical Techniques in Animal Sciences and Industry. (3) I. Principles of analytical procedures used in research in animal sciences and industries. One hour rec. and six hours lab a week. ASI-850-1-0104

ASI 855. Methods in Radioisotope Use and Radioimmunoassays. (2) I, in even years. Study of radioisotope use in physiological applications of research in domestic animals including radioactive decay, detection methodology, isotope dilution, and measurement of biological substances and hormones utilizing enzyme-linked immunoassays (ELISA) and radioimmunoassays (RIA). One hour rec. and three hours lab a week. Pr.: BIOCH 521. ASI-855-1-0104.

ASI 890. Graduate Seminar in Animal Sciences and Industry. (1) I, II. Discussion of research and technical problems in the discipline. Attendance required of all departmental graduate students. Maximum of 2 hours may be applied toward an advanced degree. ASI-890-0-0104

ASI 898. Master's Report. (2) I, II, S. A written report of either research or problem work on a topic in the major field. Pr.: Consult major professor. ASI-899-4-0104

ASI 899. Master's Research in Animal Sciences and Industry. (Var.) I, II, S. Research leading to the completion of a master's thesis. Pr.: Consult major professor. ASI-899-4-0104

ASI 900. Topics in Ruminant Nutrition. (2) II, in even years. Advanced consideration of theoretical and applied ruminant nutrition—classical and current development of feeding standards; energy and nutrient metabolism. Emphasis on discussion of advanced topics of current interest in ruminant nutrition. Pr.: ASI 700, 820. ASI-900-0-0104

ASI 901. Topics in Monogastric Nutrition. (2) II, in odd years. Lectures and assigned readings concerned with determination of nutrient requirements; nutrient utilization and metabolism; nutrient interrelationships; feeding frequency; feed processing; appetite factors; methods of determining design and techniques useful in monogastric nutrition research. Pr.: ASI 614. ASI-901-0-0104

ASI 905. Topics in Animal Breeding. (2) On sufficient demand. Lectures and assigned reading concerned with animal breeding research techniques. Emphasis on discussion of advanced topics of current interest in animal breeding. Pr.: ASI 749. ASI-905-0-0104

ASI 907. Techniques in Animal Nutrition Research. (3) I, in odd years. Use of animals, markers, and in vitro methods for the evaluation of feedstuffs. In vivo techniques for measuring absorption and metabolism. Two hours lec. and three hours lab a week. Pr.: BIOCH 521 and ASI 850. ASI-907-1-0104

ASI 915. Food Toxicology. (2) II. This course deals with the study of occurrence, detection, and control of microbial toxins and chemical toxins in fresh and processed foods. The genetics, physiology, and mechanisms of toxin production by microbial cells and the chemistry, formation, and interactions of chemical toxins with food systems during food processing will be addressed. Two hours lec. a week. Pr.: ASI 607 and 715. ASI-915-0-0113

ASI 920. Energy Utilization in Domestic Livestock. (2) I, in odd years. Comprehensive discussion of the development and application of energy systems used to guide livestock feeding, procedures used in energy experimentation, dietary/digestive/environmental factors that influence efficiency of energy utilization, and the efficiencies with which different energy substrates are used to support various maintenance and production functions. Emphasis will be placed upon ruminants. Two hours lec. a week. Pr.: BIOCH 521. ASI-920-0-0104

ASI 930. Advanced Meat Science. (3) I, in odd years. On sufficient demand. Basic biochemical, physiological, and histological properties of muscle and related tissues; muscle contraction, rigor mortis, and muscle hydration; maturation; processing by thermal, dehydration, and cold sterilization techniques; meat flavor chemistry; meat research techniques. Three hours rec. a week. Pr.: ASI 777 or equiv.; and a course in biochemistry. ASI-930-0-0104

ASI 961. Graduate Problem in Animal Sciences and Industry. (Var.) I, II, S. In-depth study of a topic supervised by a member of the graduate faculty. Pr.: Permission of supervising faculty member. ASI-961-3-0104

ASI 990. Seminar in Animal Sciences Research. (1) I, II. Weekly evaluation of the scientific literature and the reasoning underlying the selection of research problems, the formulation and testing of hypotheses, and the evaluation and presentation of results. Pr.: Approval of major professor. ASI-990-0-0104

ASI 999. Doctoral Research in Animal Sciences and Industry. (Var.) I, II, S. Research leading to the completion of a Ph.D. degree. Pr.: Consult major professor. ASI-999-4-0104

Crop Protection

Advisors: Barry A. Dover,* Coordinator; Agronomy: Moshier; Entomology: Blocker and Broce; Forestry: Geyer; Grain Science: Pedersen; Horticulture: Hellman; Plant Pathology: Bockus, Hetrick, Pfender, and Schwenk.

Undergraduate study

Bachelor of science in agriculture—127 semester hours

Crop protection deals with the proper use of various types of control of crop pests (insects, plant diseases, weeds, and nematodes), and is often termed pest management or integrated control. The goal is to minimize cost and produce nutritious food and good fiber, while avoiding adverse effects on man, wildlife, and the environment.

The crop protection curriculum is administered by a committee of faculty from the Departments of Agronomy, Entomology, Forestry, Horticulture, and Plant Pathology. Persons interested in the curriculum should contact the dean, College of Agriculture, for additional information and assignment of an advisor. It offers options as discussed below.

The pest management option is designed to prepare a student to recognize and analyze factors that cause pest problems; prescribe an economical control that does not violate state or federal regulations and that has minimal adverse effects on the environment; advise on control programs, including ecologically sound preventive measures; and use new biological, cultural, and chemical controls as they evolve.

The business and industries option permits students to take more business and economics courses and fewer biological science courses, while still providing basic core courses in entomology, plant pathology, weed science, and nematology. It is for students interested in private business, retail sales, and management.

The entomology and plant pathology science options are designed for students who wish to specialize and/or do graduate study in the various areas of those sciences.

Students majoring in crop protection are required to complete the following basic courses:

General requirements

| | | |
|-----------|------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| GENAG 101 | Ag Orientation | 1 |

| | | |
|--------------------------------|--|-----|
| MATH 100 | College Algebra | 3 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 110 | General Chemistry | 5 |
| MKT 443 | Sales Communication or equivalent course | 2-3 |
| ECON 110 | Economics I | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| Humanities and social sciences | | 9 |

Other requirements depend upon the option selected.

Pest management option

Curriculum requirements:

| | | |
|-----------|------------------------------------|-----|
| AGRON 330 | Weed Management | 3 |
| ENTOM 300 | Economic Entomology | 3 |
| ENTOM 312 | General Entomology | 2 |
| ENTOM 314 | Insect and Arachnid Identification | 3 |
| ENTOM 420 | Insecticides: Properties and Laws | 2 |
| ENTOM 612 | Insect Pest Diagnosis | 2 |
| HORT 582 | Pesticide Application Technology | 3 |
| PLPTH 500 | Principles of Plant Pathology | 3 |
| PLPTH 607 | Plant Disease Diagnosis | 2 |
| PLPTH 613 | Plant Disease Control | 3 |
| ENTOM 651 | Internship in Crop Protection | 1-2 |
| ENTOM 652 | Seminar in Crop Protection | 1 |

Supporting courses—agriculture and biological sciences:

| | | |
|-----------|-------------------------|---|
| HORT 200 | Plant Science | 4 |
| AGRON 200 | Crop Science | 4 |
| AGRON 305 | Soils | 4 |
| AGRON 375 | Soil Fertility | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| BIOL 210 | General Botany | 4 |
| BIOL 529 | Fundamentals of Ecology | 3 |
| ATM 653 | Irrigation Practices | 3 |

Four or more of the following suggested:*

| | | |
|-----------|-----------------------------------|---|
| AGRON 350 | Crop and Seed Quality | 2 |
| AGRON 360 | Crop Growth and Development | 3 |
| AGRON 501 | Range Management | 3 |
| AGRON 515 | Soil Genesis and Classification | 3 |
| AGRON 520 | Grain Production | 3 |
| AGRON 525 | Crop and Soil Management | 3 |
| AGRON 550 | Forage Management and Utilization | 3 |
| ENTOM 625 | Biological Control of Insects | 3 |
| FOR 275 | Farm Forestry | 3 |
| HORT 400 | Plant Propagation | 3 |
| HORT 520 | Fruit Production | 3 |
| HORT 560 | Vegetable Crop Ecology | 3 |
| HORT 575 | Nursery Management | 3 |
| HORT 612 | Turf Management | 3 |

Supporting courses—physical sciences and mathematics:

| | | |
|-----------------------------------|---|---|
| PHYS 115 | Descriptive Physics | 4 |
| BIOCH 120 | Introductory Organic and Biological Chemistry | 5 |
| CIS 110 | Introduction to Personal Computing | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| Computer Language Lab (200 level) | | 2 |
| STAT 340 | Biometrics I | 3 |

Business and industries option

Curriculum requirements:

Curriculum requirements for the business and industries option are the same as the curriculum requirements under the pest management option.

Supporting courses—agriculture and biological sciences:

| | | |
|-----------|---------------|---|
| HORT 200 | Plant Science | 4 |
| AGRON 220 | Crop Science | 4 |
| AGRON 305 | Soils | 4 |

| | | |
|-----------|-----------------------|---|
| AGRON 375 | Soil Fertility | 4 |
| BIOL 198 | Principles of Biology | 4 |

Two or more from list of supporting courses of pest management option.*

Supporting courses—physical sciences and mathematics:

| | | |
|-----------|--|---|
| STAT 340 | Biometrics I | 3 |
| PHYS 115 | Descriptive Physics | 4 |
| BIOCH 120 | Introduction to Organic and Biological Chemistry | 5 |
| CIS 110 | Introduction to Personal Computing | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS 20- | Computer Language Lab | 2 |

Supporting courses—business administration and economics:

| | | |
|-----------|------------------------------|---|
| ACCTG 211 | Financial Accounting | 3 |
| MANGT 202 | Small Business Operations | 3 |
| MANGT 390 | Business Law I | 3 |
| MANGT 420 | Management Concepts | 3 |
| MKTG 400 | Marketing | 3 |
| MKTG 542 | Sales Management | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| ECON 530 | Money and Banking | 3 |
| ECON 620 | Labor Economics | 3 |
| ECON 631 | Principles of Transportation | 3 |
| AGEC 518 | Agribusiness Management | 3 |

Four or more of the following suggested:

All other courses in AGECE with a 500 or higher course number.

Entomology

T. L. Hopkins, Acting Head

Professors Bauernfeind, Blocker,* Broce,* Brooks, Cress,* Elzinga,* Harvey,* Hatchett,* Hopkins,* McGaughey,* Mock,* and Wilde;* Associate Professors Beeman,* Buschman,* Higgins,* Howard,* Kadoum,* Lippert, Nechols,* Reese,* and Sloderbeck; Assistant Professors Black,* Dick, Dover,* Flinn,* Hagstrum,* Harris,* Margolies,* and Wright;* Emeriti: Professors Gates, DePew, Horber, Mills, and Thompson.

Entomology is the study of insects and related arthropods. Applied entomology stresses their relations to plants and animals, including humans. Courses fall into two groups: broad, general courses suitable for any student; and professional courses which provide training for research, teaching, and administration in colleges, experiment stations, health services, and agencies of the state and federal governments, industry, foundations, and private practice.

Students majoring in other fields may have a special interest in entomology as part of their curriculum. Courses 300 or 312 and 313 or 314 or 305 are recommended.

Undergraduate study

Bachelor of science in agriculture under the crop protection curriculum, which includes the entomology science option.

Students interested in the general field of protecting plants from insects, plant diseases, and weeds should consider the pest management or business and industries option of the crop protection curriculum.

Students particularly interested in insects as a subject of special study, including insects in relation to plants, humans, or animals, and students anticipating graduate work should consider the entomology science option of the crop protection curriculum.

Entomology science option of the crop protection curriculum

Students majoring in this option take, in addition to the general requirements for the curriculum, the following:

Entomology courses

| | | |
|-----------|----------------------------|---|
| ENTOM 312 | General Entomology | 2 |
| ENTOM 313 | General Entomology Lab | 1 |
| ENTOM 660 | External Insect Morphology | 3 |
| ENTOM 710 | Insect Taxonomy | 3 |
| ENTOM 767 | Insect Pest Management | 3 |

Other agriculture and biology courses

| | | |
|----------|-------------------------|---|
| ASI 500 | Genetics | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| BIOL 455 | Microbiology | 5 |
| BIOL 529 | Fundamentals of Ecology | 3 |
| BIOL 631 | Ecology | 3 |

Approved electives

Physical sciences and mathematics

| | | |
|----------|--------------------|---|
| MATH 150 | Plane Trigonometry | 3 |
| STAT 340 | Biometrics I | 3 |

One of the following:

| | | |
|---------|----------------------------------|---|
| CHM 190 | Elementary Organic Chemistry | 3 |
| CHM 191 | Elementary Organic Chemistry Lab | 2 |
| CHM 531 | Organic Chemistry I | 3 |
| CHM 532 | Organic Chemistry Lab | 2 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Lab | 2 |

One of the following:

| | | |
|-----------|--------------------------------------|---|
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Lab | 2 |
| BIOCH 525 | Plant Biochemistry Lab | 2 |
| BIOCH 201 | Elementary Biochemistry | 3 |
| BIOCH 202 | Elementary Biochemistry Lab | 2 |
| MATH 220 | Analytical Geometry and Calculus I | 4 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS 201 | FORTRAN Language Laboratory | 2 |

One of the following:

| | | |
|----------|---------------------|---|
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| PHYS 115 | Descriptive Physics | 4 |

Graduate study

The M.S. and Ph.D. degrees are offered. For majors, professional courses in entomology and a broad, basic training in agriculture, biological, chemical, and physical sciences are needed to provide a satisfactory foundation for graduate work. Facilities for research include field insectaries, greenhouses, environmental chambers, temperature- and humidity-controlled rooms for rearing insects, computer, biochemical, and radioisotope laboratories, and a scanning electron microscope.

Major laboratories are provided for study of insect behavior, biological control, genetics, host plant resistance to insects, taxonomy, toxicology, physiology, and biochemistry; and for biology, ecology, and control of stored products insects and insects attacking humans and animals. There are laboratories for insecticide testing and for determination of insecticide residues. Facilities for the investigation of the biology and control of insects attacking horticultural crops, livestock, grasslands, and field crops also are provided.

Mutual cooperation with entomologists at the U.S. Grain Marketing Research Center as well as with research faculty in on-campus departments and area research stations further enhances graduate studies.

Undergraduate credit

ENTOM 300. Economic Entomology. (3) II. Classification, life histories, habits, and principles of control of important economic insects. For agriculture majors. Two hours lec. and two hours lab a week. ENTOM-300-1-0421

ENTOM 305. Livestock Entomology. (2) I. Biology and behavior of insects and other pests attacking livestock, poultry, pets, and wildlife. Current recommendations for control are discussed. For students interested in livestock production, feedlot management, dairy and poultry science, and pre-veterinary medicine, as well as other agricultural curricula. Two hours lecture-demonstration a week. ENTOM-305-0-0421

ENTOM 306. Livestock Entomology Laboratory. (1) I. One two-hour lab a week. ENTOM-306-1-0421

ENTOM 312. General Entomology. (2) I, II. A basic study of insects and related arthropods, their structure, physiology, behavior, and relations to plants and animals, including man. Two hours rec. a week. ENTOM-312-0-0421

ENTOM 313. General Entomology Laboratory. (1) I, II. Identification, food preferences, and habitat preferences of the common insects. Two hours a week. ENTOM-313-1-0421

ENTOM 314. Insect and Arachnid Identification. (3) I. Offered 1990 and alternate years. Pr.: ENTOM 312 or conc. enrollment. (Not open to entomology science option majors in crop protection curriculum.) Identification of common insects and arachnids. Two three-hour labs a week. ENTOM-314-1-0421

ENTOM 320. Horticultural Entomology. (3) I. Biological principles and management considerations for insect and related arthropods affecting horticulture. Practical application of classification and life history information for accurate recognition, monitoring, and pest management decisions. Control tactics, and conservation of beneficial species. Two hours lec. and two hours lab a week. ENTOM-320-1-0421

Undergraduate and graduate credit

ENTOM 612. Insect Pest Diagnosis. (2) I. Offered 1991 and alternate years. Diagnosis of plant damage by insects and mites, recognition of harmful insects and mites and beneficial insects. Emphasis on field crop pests but pests of other crops will be considered if there is sufficient interest. One hour lec. and two hours lab a week. Pr.: ENTOM 314 or 710. ENTOM-612-6-0421

ENTOM 620. Insecticides: Properties and Laws. (2) II. Offered 1990 and alternate years. Study of chemical and biological properties of insecticides. Formulations, use, safety, environmental impact, and federal and state laws regulating pesticides. Two hours lec. a week. Pr.: CHM 190. ENTOM-620-0-0421

ENTOM 651. Internship in Crop Protection. (1-2) I. On-the-job training in various areas of crop protection. One hour credit for each four weeks of supervised work. A maximum of 2 credits may be applied towards a B.S. in crop protection. Credit is allowed only for approved work-study programs. Pr.: Junior standing in crop protection curriculum; or AGRON 330, ENTOM 312, and PLPTH 500. ENTOM-651-2-0421

ENTOM 652. Seminar in Crop Protection. (1) II. A discussion of modern developments in the use of integrated pest management. Pr.: AGRON 330, ENTOM 312, and PLPTH 500. One hour discussion a week. ENTOM-652-0-0421

ENTOM 706. External Insect Morphology. (3) I. Offered 1990 and alternate years. External form, structure, and anatomy; leading theories of form and structure from generalized to specialized conditions. One hour lec. and six hours lab a week. Pr.: ENTOM 300 or 312 and 313. ENTOM-706-1-0421

ENTOM 710. Insect Taxonomy. (3) II. Offered 1991 and alternate years. Families in all orders and some lower categories; principles of insect collecting and collection management; introduction of principles of phylogeny and classification for students not specializing in taxonomy. One hour lec. and six hours lab a week. Pr.: ENTOM 300 or 312 and 313; ENTOM 706 recommended but not required; insect collection desirable. ENTOM-710-1-0421

ENTOM 767. Insect Pest Management. (3) I. A presentation of the items necessary to consider in order to develop a sound pest management program, from identification of a problem to recommendations made to growers for dealing with a pest. Two hours lec. and one lab a week. Pr.: ENTOM 300 or ENTOM 312. ENTOM-767-0-0421

ENTOM 799. Problems in Entomology. (Var.) I, II, S. For nonthesis or nondissertation studies. Work in various fields of entomology. Pr.: Consent of instructor. ENTOM-799-3-0421

Graduate credit

ENTOM 805. Insects of Stored Products. (3) II. Offered 1991 and alternate years. Biology, ecology, and behavior of stored-product insects and current practices involved in their control. Two hours lec. and three hours lab a week. Pr.: ENTOM 300, or 312 and 313, or consent of instructor. ENTOM-805-1-0421

ENTOM 815. Experience In Extension Entomology. (1-3) II. Major emphasis is to give students a realistic view of the history, structure, philosophy, and position responsibilities assumed by entomology state and area specialists within the Cooperative Extension Service through hands-on experience. Pr.: ENTOM 612 or 767. ENTOM-815-3-0421

ENTOM 820. Biological Control. (3) II. Offered 1991 and alternate years. The theory and practice of biological control, with emphasis on natural enemies of insect pests. Relationship and importance of ecology and integrated pest management to biological control. Experimental approaches, evaluation, recognition, and life histories of beneficial species will be covered. Two hours lec. and two hours lab a week. Pr.: ENTOM 312 and 313 and ENTOM 891 or BIOL 529 or 631 or equiv. ENTOM-820-1-0421

ENTOM 821. Measuring Behavior. (1) II. A techniques course stressing data acquisition and analysis in behavioral research. Two hours lab each week. Pr.: ENTOM 312 or equivalent, and ENTOM 875 or BIOL 630, or consent of instructor. ENTOM-821-1-0421

ENTOM 845. Insect Control by Host Plant Resistance. (2) I. Offered 1990 and alternate years. Resistance of varieties of crop plants to insect attack and utilization in insect control; insect habits and physiology in relation to the cause of resistance and methods of breeding resistant varieties of crops. Pr.: ENTOM 300 or 312 and 313 and a course in either plant or animal genetics. ENTOM-845-0-0421

ENTOM 857. Toxicology and Properties of Insecticides. (3) I. Offered 1991 and alternate years. A study of the classification of insecticides, their types of formulations, biological properties, mode of action, and first aid treatment. Synergism, antagonism, and other interactions. Two hours lec. and two hours lab a week. Pr.: CHM 350 or consent of instructor. ENTOM-857-1-0421

ENTOM 865. Internal Insect Morphology. (3) II. Offered 1991 and alternate years. Internal anatomy of representative insects; plan and structure of internal systems. One hour lec. and six hours lab a week. Pr.: ENTOM 660. ENTOM-865-1-0421

ENTOM 875. Insect Physiology. (3) I. Offered 1991 and alternate years. Functions of insect systems for development, metamorphosis, and reproduction. Physiological and biochemical mechanisms underlying insect activities, behavior, and ecological adaptations. Two hours lec. and three hours lab a week. Pr.: ENTOM 865 or consent of instructor. ENTOM-875-1-0421

ENTOM 892. Insect Ecology. (4) I. Offered 1991 and alternate years. Abiotic and biotic factors underlying the distribution and abundance of insects. How these factors affect insect population processes, life history adaptations, and community structure. Special attention given to current literature and experimental approaches. Three hours lec. and two hours lab a week. Pr.: BIOL 529 or BIOL 631 or equiv. ENTOM-892-0-0421

ENTOM 898. Master's Report in Entomology. (Var.) I, II, S. Work in various fields of entomology. Pr.: Consent of instructor. ENTOM-898-4-0421

ENTOM 899. Master's Research in Entomology. (Var.) I, II, S. For students majoring in entomology. Pr.: Knowledge in special area and consent of instructor. ENTOM-899-4-0421

ENTOM 910. Insect Genetics. (3) I. Offered 1991 and alternate years. The course will initially describe the variety of genetic systems found in insects. Laboratory and statistical techniques will be discussed for studying genetic variation in insect populations. The final part of the course will focus on means for genetic manipulation of populations. The laboratory session will be used to discuss and/or demonstrate techniques for studying insect genetics. Two hours lec. and one three-hour lab each week. Pr.: BIOL 430 or ASI 500, ENTOM 710, and ENTOM 875. ENTOM-910-1-0421

ENTOM 920. Insect Behavior. (3) II. Offered 1991 and alternate years. The study of the mechanisms, ecology, and evolution of behavior in social and nonsocial insects. Pr.: ENTOM 312, 313, and 875. Two hours lec. and two hours lab a week. ENTOM-920-0-0421

ENTOM 930. Topics in Environmental and Physiological Entomology. (Var.) I, II. Selected topics for advanced study in insect behavior, ecology, genetics, physiology, and related areas. Pr.: Consent of instructor. ENTOM-930-3-0421

ENTOM 932. Topics in General and Systematic Entomology. (Var.) I, II. Principles of taxonomy; advanced taxonomy; taxonomy of immature insects; acarology; and biological literature. Pr.: ENTOM 710 and consent of instructor. ENTOM-932-1-0421

ENTOM 995. Entomology Seminar. (I) I, II.
Pr.: Consult seminar committee. Pass/fail grade only.
ENTOM-995-0-0421

ENTOM 999. Research in Entomology. (Var.) I, II, S.
Dissertation credit for students majoring in entomology.
Pr.: Knowledge in special area and consent of
instructor. ENTOM-999-4-0421

Food Science and Industry

Advisors: Cunningham, Fung, Hunt, Jeon, Kastner, Kropf, Roberts, and Smith, Animal Sciences and Industry; Hosenev and Seib, Grain Science and Industry.

Undergraduate study

Bachelor of science in food science and industry—127 semester hours

This curriculum deals with the theoretical and practical aspects of the food industry from production of the raw material through acceptance of the finished product.

The curriculum, designed to educate individuals in the discipline of food science, balances fundamental principles and application of food theory within a flexible program that permits students to tailor education to fit personal career goals. The program is certified by the National Institute of Food Technologists.

Employment opportunities include production management, product and process research and development, public health and regulatory agency service, teaching, merchandising, advertising, technical service and marketing, quality control supervision, and positions in international food agencies.

Students may select one of three options offered through the College of Agriculture: business, processing, or science.

The processing option emphasizes processing techniques through such courses as baking science, poultry products technology, food engineering, handling and processing fruits and vegetables, meat technology, dairy food processing, processing grains for food, and meat packing plant operations.

In preparing students to manage food industries, the business option emphasizes accounting, business law, marketing, business finance, management, personnel, labor legislation, consumer behavior, and sales. It also incorporates a few processing courses.

The science option prepares students for specializing in research, product development, and quality control. It often leads to graduate work in food science. Courses are selected to give students excellent backgrounds in mathematics, chemistry, microbiology, statistics, and computer

science, along with an understanding of processing and food characteristics.

The food science curriculum involves the Colleges of Agriculture and Human Ecology. In addition to the above three options, students may select from the consumer communications and technical options in the College of Human Ecology section of this catalog.

Facilities range from those required for fundamental studies to pilot plant production and utilization of dairy, poultry, red meat, horticultural, and grain-based foods.

Scholarships are available through the National Institute of Food Technologists to qualified incoming freshman planning to major in food science and industry. High school seniors interested in applying for a scholarship should contact the director of resident instruction in agriculture or the dean of human ecology by December of their senior year.

Graduate study

All options may lead to graduate study in food science. Both M.S. and Ph.D. programs are offered.

General requirements

| | | |
|--------------------------------------|---|-----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking 1A | 2 |
| PE 101 | Principles of Physical Fitness | 1 |
| ECON 110 | Economics I | 3 |
| MATH 100 | College Algebra | 3 |
| MATH 205 | General Calculus and Linear Algebra | 3 |
| MATH 210 | Technical Calculus I | 3 |
| STAT 320 | Elements of Statistics | 3 |
| STAT 340 | Biometrics I | 3 |
| STAT 350 | Business Economics Statistics I | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 455 | Microbiology* | 5 |
| ASI 607 | Food Microbiology | 4 |
| ASI 305 | Fundamentals of Food Processing | 3 |
| ASI 411 | Introductory Food Chemistry | 3 |
| FN 501 | Food Science | 3 |
| ASI 615 | Food Analysis | 3 |
| FN 790 | Food Research Technology | 3 |
| ET 440 or ATM 441 | Introduction to Food Engineering Technology | 3 |
| ET 441 or ATM 441 | Food Engineering Technology Laboratory | 1 |
| FN 502 | Principles of Nutrition | 3 |
| Two listed processing electives | | 4-9 |
| Social sciences/humanities electives | | 9 |

Additional courses required for specific options

Business option

| | | |
|-----------|--------------------------------------|---|
| CHM 110 | General Chemistry | 5 |
| PHYS 115 | Descriptive Physics | 4 |
| CHM 190 | Elementary Organic Chemistry and Lab | 5 |
| BIOCH 201 | Elements of Biochemistry | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| MKTG 400 | Marketing | 3 |

| | | |
|------------------------|----------------------|-----|
| MANGT 420 | Management Concepts | 3 |
| GENAG 500 | Food Science Seminar | 1 |
| Professional electives | | 15 |
| Unrestricted electives | | 3-8 |

A minimum of 15 hours from the listed business electives, besides ACCTG 211 and 221, MKTG 400, and MANGT 420.

Total hours from the College of Business Administration cannot exceed 27.

Processing option

| | | |
|------------------------|-------------------------------|-----|
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 357 | General Organic Chemistry Lab | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Lab | 2 |
| GENAG 500 | Food Science Seminar | 1 |
| Unrestricted electives | | 3-8 |

Take a minimum of 24 hours from the list of processing and/or technology electives. Select 13 hours of professional electives for the processing emphasis and 3 hours for the technology emphasis.

Additional courses required for processing emphasis:

| | | |
|----------|---------------------|---|
| PHYS 115 | Descriptive Physics | 4 |
| PHYS 113 | General Physics I | 4 |

Additional courses required for technology emphasis:

| | | |
|----------|-----------------------|---|
| MATH 150 | Plane Trigonometry | 3 |
| MATH 211 | Technical Calculus II | 3 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |

Science option

| | | |
|------------------------|-------------------------------|-----|
| PSYCH 110 | General Psychology* | 3 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| PHYS 113 | General Physics I | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Lab | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Lab | 2 |
| GENAG 500 | Food Science Seminar | 1 |
| Professional electives | | 30 |
| Unrestricted electives | | 3-8 |

*Satisfies 3 of the 9 hours of social science electives.

127 hours required for graduation

Business electives

| | | |
|-----------------------------------|--|---|
| ACCTG 211 | Financial Accounting | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| AGEC 100 | Agricultural Economics and Agribusiness | 3 |
| AGEC 505 | Agricultural Market Structures | 3 |
| AGEC 510 | Agricultural Policy | 3 |
| AGEC 515 | Marketing of Agriculture and Food Products | 3 |
| AGEC 518 | Agribusiness Management | 3 |
| AGEC 520 | Grain Marketing | 3 |
| AGEC 522 | Commodity Futures Markets | 3 |
| AGEC 521 | Livestock and Meat Marketing | 3 |
| ASI 694 | Food Plant Management | 2 |
| CIS 200 | Fundamentals of Computer Programming | 3 |
| Computer language lab (200 level) | | 1 |
| ECON 120 | Economics II | 3 |
| FINAN 450 | Business Finance | 3 |
| MANGT 202 | Small Business Operations | 3 |
| MANGT 390 | Business Law I | 3 |
| MANGT 420 | Management Concepts | 3 |
| MANGT 530 | Labor Legislation | 3 |
| MANGT 531 | Personnel and Wage Administration | 3 |
| MKTG 400 | Marketing | 3 |
| MKTG 450 | Consumer Behavior | 3 |
| MKTG 541 | Retailing | 3 |
| MKTG 542 | Sales management | 3 |

| | | |
|----------|--------------------|---|
| MKTG 640 | Marketing Research | 3 |
| MKTG 545 | Marketing Channels | 3 |

Other professional electives can be substituted as appropriate.

Food science electives

| | | |
|---------|---|---|
| ASI 302 | Introduction to Food Science | 3 |
| ASI 430 | Food Products Evaluation | 3 |
| ASI 606 | Instrumental Analysis of Food and Agricultural Products | 2 |
| ASI 630 | Egg Science | 2 |
| ASI 635 | Poultry Meat Technology | 2 |
| ASI 694 | Food Plant management | 2 |
| ASI 695 | Quality Assurance | 3 |
| ASI 713 | Rapid Methods and Automation in Microbiology | 2 |

| | | |
|--------|--|---|
| FN 301 | Trends in Food Products | 3 |
| FN 612 | Principles of Food Product Development and Control | 3 |

| | | |
|--------|--|---|
| FN 616 | Principles of Food Demonstration | 3 |
| FN 620 | Sensory Analysis of Foods | 3 |
| FN 680 | Seminar in Foods and Nutrition | 2 |
| FN 720 | Food Systems | 3 |
| FN 750 | Nutritional Aspects of Food Processing and Preparation | 3 |

| | | |
|-----------|--|---|
| GENAG 630 | Food Science Problems | V |
| GRSC 120 | Introduction to Bakery Technology | 2 |
| GRSC 602 | Cereal Science | 3 |
| GRSC 651 | Food and Feed Plant Sanitation | 4 |
| GRSC 661 | Qualities of Feed and Food Ingredients | 3 |

| | | |
|----------|---|---|
| HORT 792 | Handling and Processing Fruits and Vegetables | 3 |
|----------|---|---|

Nutrition electives

| | | |
|--------|-------------------------------------|---|
| FN 603 | Maternal and Child Nutrition | 3 |
| FN 610 | Nutrition Throughout the Life Cycle | 3 |

| | | |
|--------|--|-----|
| FN 635 | Nutrition and Exercise | 3 |
| FN 700 | Community Nutrition | 3 |
| FN 702 | Nutrition in Developing Countries | 3 |
| FN 710 | Bionutrition | 3 |
| FN 712 | Diet Therapy | 3 |
| FN 750 | Nutritional Aspects of Food Processing and Preparation | 2-3 |

| | | |
|----------|---|---|
| GRSC 705 | Nutritional Properties of Cereals and Legumes | 3 |
|----------|---|---|

Processing electives

All courses must have labs.

| | | |
|---------|-------------------------------------|---|
| ASI 350 | Meat Science | 3 |
| ASI 361 | Meat Processing | 2 |
| ASI 405 | Fundamentals of Milk Processing | 3 |
| ASI 502 | Principles of Dairy Food Processing | 4 |

| | | |
|---------|--------------------------------------|-----|
| ASI 605 | Fresh Meat Operations | 3 |
| ASI 610 | Processed Meats Operations | 2 |
| ASI 671 | Meat Selection and Utilization | 2 |
| ASI 725 | Meat Packing Plant Operations | 2-3 |
| ASI 777 | Meat Technology | 4 |
| ET 640 | Food Processing Operations | 5 |
| FN 300 | Food Preparation and Meal Management | 4 |

| | | |
|----------|-------------------------|---|
| GRSC 100 | Principles of Milling | 3 |
| GRSC 625 | Flour and Dough Testing | 3 |
| GRSC 635 | Baking Science I | 2 |

| | | |
|----------|----------------------|---|
| GRSC 636 | Baking Science I Lab | 2 |
| GRSC 737 | Baking Science II | 2 |

| | | |
|----------|-----------------------|---|
| GRSC 738 | Baking Science II Lab | 1 |
|----------|-----------------------|---|

Technology electives

| | | |
|---------|------------------------------------|---|
| ATM 450 | Functional Components of Machinery | 3 |
|---------|------------------------------------|---|

| | | |
|---------|--|---|
| ATM 526 | Agricultural and Industrial Hydraulics | 3 |
|---------|--|---|

| | | |
|---------|---|---|
| ATM 563 | Electrical Systems and Controls | 3 |
| ET 410 | Properties of Engineering Materials | 2 |
| ET 411 | Properties of Engineering Materials Lab | 1 |

| | | |
|--------|---|---|
| ET 415 | Computer Applications in Engineering Technology | 2 |
| ET 431 | Electrical Circuit Technology I | 4 |
| ET 512 | Mechanics of Fluids | 3 |
| ET 514 | Energy Conversion Technology | 3 |
| ET 640 | Food Processing Operations | 5 |
| IE 372 | Computers and Data Processing | 2 |
| ME 212 | Engineering Graphics I | 2 |
| ME 560 | Engineering Economics | 3 |

Forestry

Thomas D. Warner, Head
Raymond Aslin, State Forester
John Strickler, Extension Program Leader

Professors Geyer,* Naughton, Nighswonger, Strickler, and Warner; Associate Professors Aslin, Bratton, Cable,* Gould, Loucks, Pinkerton, and Rowland; Assistant Professors Bruckerhoff, Hildebrandt, Kunkel, Lynch, and Strine.

Undergraduate study

Society faces a future of making potentially infinite demands upon finite natural resources. Appropriate management of America's natural resources will require the best efforts of dedicated, trained professional natural resource managers. A basic objective of natural resource managers is to provide essential goods and services while maintaining the highest environmental standards.

The Department of Forestry offers two career-oriented programs: a two-year pre-forestry curriculum and a four-year park resource management curriculum that leads to a bachelor of science degree.

Hours earned in the pre-forestry program can be transferred to most other universities offering degrees in forestry. The University has a reciprocal agreement with the University of Missouri at Columbia which waives out-of-state tuition for pre-forestry transfers. The department does not offer graduate degrees.

Pre-forestry (two-year program)

Freshman

Fall semester

| | | |
|-----------|--------------------------|-------|
| BIOL 210 | General Botany | 4 |
| ENGL 100 | English Composition I | 3 |
| SPCH 106 | Public Speaking I | 3 |
| MATH 100 | College Algebra* | 3 |
| FOR 285 | Introduction to Forestry | 3 |
| Electives | | 1-2 |
| | | 17-18 |

Spring semester

| | | |
|----------|--------------------------------|-------|
| CHM 110 | General Chemistry | 5 |
| CHM 210 | Chemistry I | 4 |
| ENGL 120 | English Composition II | 3 |
| MATH 150 | Plane Trigonometry* | 3 |
| GEOL 100 | Introduction to Geology | 3 |
| FOR 210 | Forestry Graphics | 2 |
| PE 101 | Principles of Physical Fitness | 1 |
| | | 16-17 |

*Students with proper mathematics background are encouraged to substitute calculus for these courses.

Sophomore

Fall semester

| | | |
|-----------|--------------------------|----|
| AGRON 305 | Soils | 4 |
| FOR 330 | Dendrology I | 2 |
| FOR 311 | Forestry Instruments | 2 |
| STAT 340 | Biometrics I | 3 |
| FOR 321 | Forestry Resource Topics | 1 |
| ECON 110 | Economics I | 3 |
| Electives | | 3 |
| | | 18 |

Spring semester

| | | |
|----------|--------------------------------------|----|
| PHYS 115 | Descriptive Physics | 4 |
| ECON 120 | Economics II | 3 |
| FOR 340 | Dendrology II | 2 |
| CE 212 | Elementary Engineering Surveying | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS 206 | BASIC Language Laboratory | 2 |
| | | 16 |

Park resource management

Bachelor of science in agriculture—
127 semester hours

Freshman

Fall semester

| | | |
|-----------|---|----|
| GENAG 101 | Ag Orientation | 1 |
| CHM 110 | General Chemistry | 5 |
| ENGL 100 | English Composition I | 3 |
| FOR 375 | Introduction to Natural Resource Management | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| MATH 100 | College Algebra | 3 |
| | | 16 |

Spring semester

| | | |
|-----------|------------------------|----|
| ENGL 120 | English Composition II | 3 |
| MATH 150 | Plane Trigonometry | 3 |
| SPCH 106 | Public Speaking I | 3 |
| BIOL 210 | General Botany | 4 |
| Electives | | 3 |
| | | 16 |

Sophomore

Fall Semester

| | | |
|-----------|---------------------------|-------|
| FOR 285 | Introduction to Forestry | 3 |
| ECON 110 | Economics I | 3 |
| FOR 330 | Dendrology I | 2 |
| | or | |
| HORT 374 | Woody Plants | 3 |
| GEOL 100 | Introduction to Geology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| BIOL 529 | Fundamentals of Ecology | 3 |
| | | 17-18 |

Spring semester

| | | |
|-----------|---|-------|
| AGRON 305 | Soils | 4 |
| FOR 385 | Microcomputer Applications in Natural Resource Management | 3 |
| FOR 340 | Dendrology II | 2 |
| | or | |
| HORT 375 | Woody Plants | 3 |
| FOR 440 | Use of Natural Resources for Leisure | 3 |
| Electives | | 3 |
| | | 15-16 |

Junior

Fall semester

| | | |
|-----------|-----------------------------------|----|
| PHYS 115 | Descriptive Physics | 4 |
| POLSC 110 | Introduction to Political Science | 3 |
| | or | |
| POLSC 520 | State and Local Government | 3 |
| STAT 330 | Elementary Statistics | 3 |
| | or | |
| STAT 340 | Biometrics | 3 |
| AGEC 525 | Natural Resource Economics | 3 |
| Electives | | 3 |
| | | 16 |

Spring semester

| | | |
|-----------|---|----|
| BIOL 433 | Wildlife Conservation | 3 |
| ENTOM 312 | General Entomology | 2 |
| ENTOM 313 | General Entomology Laboratory | 1 |
| FOR 635 | Methods of Environmental Interpretation | 3 |
| HORT 200 | Plant Sciences | 4 |
| Electives | | 3 |
| | | 16 |

Senior**Fall semester**

| | | |
|-----------|------------------------------------|----|
| FOR 645 | Park Management Seminar | 1 |
| FOR 350 | Park Field Studies | 2 |
| FOR 699 | Park Administration and Management | 3 |
| HORT 612 | Turf Management | 3 |
| HORT 585 | Arboriculture | 3 |
| Electives | | 3 |
| | | 15 |

Spring semester

| | | |
|-----------|-----------------|-------|
| FOR 590 | Park Operations | 4 |
| Electives | | 9-11 |
| | | 13-15 |

At least 6 hours must be in humanities or social sciences; 12-15 hours of free electives.

Select four courses from:

| | | |
|-----------|---|---|
| FOR 510 | Urban Forestry | 3 |
| FOR 520 | Urban Forestry Administration | 3 |
| FOR 575 | Management of Water Resources for Leisure | 3 |
| FOR 640 | Advanced Environmental Interpretation | 3 |
| FOR 660 | Travel, Tourism, and Park Management | 3 |
| AGRON 501 | Range Management | 3 |
| GEOG 705 | Remote Sensing of the Environment | 2 |
| PLPTH 500 | Principles of Plant Pathology | 3 |
| JMC 512 | Public Relations | 3 |

Undergraduate credit

FOR 210. Forestry Graphics. (2) II. Construction and interpretation of maps, charts, and graphs employed in forestry and related resources. One hour rec. and three hours lab a week. No prerequisites. FOR-210-1-0114

FOR 275. Farm Forestry. (3) II. Care and management of existing farm woodlots for maximum production of fuel wood and saw timber, livestock and homestead protection, and recreational opportunities. Establishment and care of new forest plantings for timber production, nut production, wildlife habitat improvement, wind protection, and snow management. Land-use decisions related to Kansas conditions will also be covered. FOR-275-1-0114

FOR 285. Introduction to Forestry. (3) I. An introduction to American forestry. Forestry heritage in the U.S., importance of forests, multiple-use concepts, management practices, utilization, protection, policy, and the profession of forestry. FOR-285-0-0114

FOR 311. Forestry Instruments. (2) I. Introduction to the use of instruments and applied measurements used in forestry and related resources. One hour lec. and three hours lab a week. No prerequisites. FOR-311-1-0114

FOR 321. Forestry Resource Topics. (1) I. Student presentation of ideas, practices, and concepts in forestry or related areas. One hour rec. a week. FOR-321-0-0114

FOR 330. Dendrology I. (2) I. Identification, classification, silvical characteristics, distribution, and economic significance of important North American angiosperm trees. One hour rec. and three hours lab a week. Pr.: BIOL 210 or equiv. FOR-330-1-0114

FOR 340. Dendrology II. (2) II. Identification, classification, silvical characteristics, distribution, and economic significance of important North American gymnosperm trees. One hour rec. and three hours lab a week. Pr.: BIOL 210 or equiv. FOR-340-1-0114

FOR 350. Park and Recreation Areas Field Studies. (2) I, II, S. Required professional employment: a survey and application of the principles of park and recreation areas management and operations. Studies of selected aspects of natural resource management for recreation. Preparation and presentation of a comprehensive analysis of a specific assigned problem. Pr.: Sophomore in park resource management. FOR-350-3-0115

FOR 375. Introduction to Natural Resource Management. (3) I. A survey of historic and present-day uses, problems, and basic management approaches associated with our renewable and nonrenewable natural resources. The impact of society, economics, law, politics, and philosophy on the management and use of our natural resources will also be examined. FOR-375-0-0115

FOR 385. Microcomputer Applications in Natural Resource Management. (3) II. A microcomputer course designed to develop basic skills needed by natural resource management professionals. The course will emphasize use of the microcomputer for communication of written and graphic information, record keeping, decision making, budgeting, and investment analysis. Two hours lecture and two hours lab a week. Pr.: FOR 285 or 375. FOR-385-1-0115

FOR 440. Use of Natural Resources for Leisure. (3) II. A survey of the concepts, history, present status, and goals of outdoor recreation for leisure, with particular emphasis on the role of using natural resources for leisure. Three hours rec. a week. FOR-440-0-0115

Undergraduate and graduate credit in minor field

FOR 510. Urban Forestry. (3) I. A study of the urban forest ecosystem, with an emphasis on its management aspects. The course provides an in-depth study of the theory and practical application of integrated management of the urban forest resource. The following areas will be emphasized: urban forest environment and the role environment plays in management, practical problems in planning and design, product and wastewood use, integrated pest management, watershed protection, and water conservation and research needs. Three hours lec. a week. Pr.: BIOL 210 or HORT 200, and either FOR 330 and FOR 340 or HORT 374 and HORT 375. FOR-510-0-0115

FOR 520. Urban Forest Administration. (3) II. This course is a study of urban and community forest administration. It considers the urban forest ecosystem involving an in-depth look at ownerships, composition, distribution, benefits, values, and administrative operation. The policies and politics of successful administration will be emphasized. Three hours lec. a week. Pr.: FOR 510. FOR-520-0-0115

FOR 575. Management of Water Resources for Leisure. (3) II. A study of the management of water resources for leisure time uses. The course investigates the use of rivers, lakes, reservoirs, and marine resources. Management considerations, including agency policy formation, legal rights, use conflicts, and use valuation are covered. FOR-575-0-0115

FOR 590. Park Operations. (4) II. Planning, execution, and supervision of field maintenance and operations to include: job planning, budgeting, equipment selection and maintenance, and personnel practices. Basic park design considerations will also be covered. Pr.: Junior standing. FOR 375, FOR 440, FOR-590-1-0114

Undergraduate and graduate credit

FOR 635. Methods of Environmental Interpretation. (3) II. Principles and techniques necessary to communicate values of man's total environment to visitors in recreation and park areas. The synthesis and analysis of information necessary in various types of formal and informal presentations. The philosophy, design, and use of interpretive devices to communicate the understanding of man's total environment in recreation and park areas. Two hours rec. and three hours lab a week. Field trips required. Pr.: FOR 375 and 440. FOR-635-1-0115

FOR 640. Advanced Environmental Interpretation. (3) II. This course will build on the principles and interpretive techniques which are introduced in FOR 635. Specifically, labs will emphasize development of personal interpretive skills and students will be introduced to interpretive media not covered in FOR 635 (e.g., video equipment, computers, etc.). The lecture and readings will focus on the philosophy of interpretation and the theoretical framework for

designing and evaluating interpretive strategies. One hour lecture and four hours lab a week. Field trips required. Pr.: FOR 635. FOR-640-1-0115

FOR 641. Forestry Problems. (Var.) I, II, S. Work is offered in various fields of forestry. Pr.: Consent of instructor. FOR-641-3-0114

FOR 642. Parks and Recreation Problems. (Var.) I, II, S. Special problems and individual research in recreation. Designed for investigations and individual study not included in the student's normal course work. Pr.: Advanced undergraduate standing and consent of instructor. FOR-642-3-0115

FOR 645. Park Management Seminar. (1) I. Various exercises designed to offer the student opportunities to articulate and interact in structured small groups discussing park and recreational area management topics. FOR-645-0-0115

FOR 660. Travel, Tourism, and Park Management. (3) I, S. Advanced study of nonbusiness travel and tourism including its origins, present characteristics, economic impact, and leisure implications as they apply to park management and the use of natural resources. Field trips required at the expense of the student. Pr.: FOR 440 and junior standing. FOR-660-0-0115

FOR 699. Park Administration and Management. (3) I. Analysis of park administration and management and the detailed study of the principles of administrative behavior, using problem-solving models and case studies. Three hours rec. a week. Field trips required. Pr.: FOR 440 and 590. FOR-699-0-0115

General Agriculture

David J. Mugler,* Associate Dean and Director of Resident Instruction
Lawrence H. Erpelding, Associate Director
John B. Riley,* Assistant Director

Undergraduate credit

GENAG 101. Ag Orientation. (1) I. Objectives, organization, and procedures of the College of Agriculture and the University are studied. Historical developments and projected trends in agriculture and the application of basic sciences to agriculture are presented. Required of freshmen in agriculture. GENAG-101-0-0101

GENAG 200. Topics in Agriculture. (0-3) On sufficient demand. Selected issues in agriculture. May be repeated with change in topics. GENAG-200-0-0101

GENAG 390. Agricultural Employment. (1) I, II. Assists the agriculture student in developing a career blueprint; understanding job markets and techniques to obtain employment including recruitment/placement services, resume construction, personal interviewing, and job offer evaluation and analysis; and monitoring involved in career planning. GENAG-390-0-0101

GENAG 410. Agricultural Student Magazine. (1-5) I, II. Planning, interviewing, and preparing stories, headlines, layouts, and editing. for the *Kansas State Agriculturist* published by students in the College of Agriculture. Pr.: JMC 275. GENAG-410-2-0101

Undergraduate and graduate credit

GENAG 500. Food Science Seminar. (1) II. Review of recent developments in the food science industry and in food science research. Food science literature and intradepartmental research will provide source material. Required of all food science undergraduates in agriculture. GENAG-500-0-0101

GENAG 505. Comparative Agriculture. (1-4) Intersession. A travel-study program which is intended to acquaint students with agriculture of other countries and other parts of the U.S. and how it differs from Midwest-Great Plains agriculture relative to climate, crops, soils, livestock practices, marketing, and cultural attitudes toward agriculture. Pr.: Consent of instructor. GENAG-505-0-0101

GENAG 510. Internship in Farm Broadcasting. (3) I, II. For advanced students interested in practical application of mass media principles and techniques. May include public affairs reporting, field interviewing, and supervised production of mass media materials. Pr.: Junior standing. GENAG-510-2-0101

GENAG 515. Honors Presentation. (1) I, II, S. Presentation of completed teaching or extension activity, research project, or demonstration project. Pr.: Successfully completed honors proposal and permission of honors advisor. GENAG-515-0-0101

GENAG 630. Food Science Problems. (1-3) I, II, S. Research or related work with others, or a literature search. Written reports are required. Any field of food science for which the student has adequate background. Pr.: ASI 302 and junior standing. GENAG-630-3-0101

GENAG 770. Professional Journalism Practicum. (1-4) For advanced students. Supervised practical work in the area of professional journalism and mass communications. Includes laboratory investigation, field work, and internships. Pr.: JMC 380 or RTV 330 and consent of supervising instructor. GENAG-770-2-0101

GENAG 780. Current Topics in Agriculture. (1-3) On sufficient demand. Selected topics studied to provide an in-depth understanding of current agricultural issues. May be repeated with change in topics. Pr.: Completion of baccalaureate degree. GENAG-780-0-0101.

Graduate credit

GENAG 988. Scientific Writing. (1) I. Instruction in reporting research results, as in a scientific journal article, thesis, or dissertation. Course shows how to organize and communicate scientific findings logically, clearly, and precisely. Students who use results of their research should benefit most from the course. Pr.: M.S. or equiv. GENAG-988-0-0101

Grain Science and Industry

Charles Deyoe,* Head

Professors Balding,* Deyoe,* Eustace,* Hosney,* McElhiney,* Ponte,* Schoeff,* Seib,* Walker,* and Wetzels;* Adjunct Professors Hoover, Chung,* and Vetter;* Associate Professors Behnke,* Faubion,* Haque* (temporary), Klopfenstein,* Pedersen,* and Posner;* Adjunct Associate Professors Bolte, Seitz,* and Goodman; Assistant Professors (temporary) Acasio, and Flores; Adjunct Assistant Professor Bennett; Instructors Curran and Gwartz; Instructors (temporary) Pudden, Reddy, and Shelke; Emeriti: Professors Farrell,* Ward,* and Wilcox;* Associate Professor Wingfield,* Assistant Professor Miller.

Undergraduate study

The Department of Grain Science and Industry offers three curricula. One leads to a bachelor of science in bakery science and management; another to a bachelor of science in feed science and management; and the third to a bachelor of science in milling science and management. In the bakery science and milling science curricula, an option may be selected in administration, chemistry, or operations. The feed science curriculum has specialization electives emphasizing administration or engineering. This department also partici-

pates in the food science and industry curriculum.

Bakery science and management

Bachelor of science in bakery science and management—127 semester hours

Freshman

Fall semester

| | | |
|-----------|--------------------------------|-----------|
| GENAG 101 | Ag Orientation | 1 |
| GRSC 100 | Principles of Milling | 3 |
| CHM 210 | Chemistry I | 4 |
| ENGL 100 | English Composition I | 3 |
| MATH 100 | College Algebra | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| | | 15 |

Spring semester

| | | |
|----------|-----------------------------------|-----------|
| CHM 230 | Chemistry II | 4 |
| ECON 110 | Economics I | 3 |
| ENGL 120 | English Composition II | 3 |
| MATH 150 | Plane Trigonometry | 3 |
| GRSC 120 | Introduction to Bakery Technology | 2 |
| | | 15 |

Sophomore

Fall semester

| | | |
|----------|--------------------------|-----------|
| SPCH 105 | Public Speaking IA | 2 |
| BIOL 198 | Principles of Biology | 4 |
| | Social science electives | 3 |
| | Option A, B, or C | 7 |
| | | 16 |

Spring semester

| | | |
|----------|--------------------------|-----------|
| BIOL 455 | General Microbiology | 4 |
| | Social science electives | 6 |
| STAT 320 | Elements of Statistics | 3 |
| | Option A, B, or C | 4 |
| | | 17 |

Junior

Fall semester

| | | |
|----------|----------------------|-----------|
| GRSC 635 | Baking Science I | 2 |
| GRSC 636 | Baking Science I Lab | 2 |
| ASI 607 | Food Microbiology | 4 |
| | Option A, B, or C | 8 |
| | | 16 |

Spring semester

| | | |
|----------|-----------------------|-----------|
| GRSC 737 | Baking Science II | 2 |
| GRSC 738 | Baking Science II Lab | 1 |
| GRSC 602 | Cereal Science | 3 |
| | Option A, B, or C | 9 |
| | | 15 |

Senior

Fall semester

| | | |
|----------|---|-----------|
| GRSC 670 | Bakery Layout | 1 |
| ET 440 | Introduction to Food Engineering Technology | 3 |
| | Option A, B, or C | 13 |
| | | 17 |

Spring semester

| | | |
|----------|--------------------------------|-----------|
| GRSC 625 | Flour and Dough Testing | 3 |
| GRSC 651 | Food and Feed Plant Sanitation | 4 |
| | Option A, B, or C | 9 |
| | | 16 |

Administration option (A)

| | | |
|-----------|--|---|
| GRSC 505 | Cereal and Feed Analysis | 3 |
| BIOCH 120 | Introduction to Organic and Biological Chemistry | 4 |
| ECON 120 | Economics II | 3 |
| MATH 205 | General Calculus and Linear Algebra | 3 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| CIS 200 | Fundamentals of Computer Programming | 4 |
| ACCTG 211 | Financial Accounting | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| MANGT 420 | Management Concepts | 3 |
| MKTG 400 | Marketing | 3 |
| FINAN 450 | Business Finance | 3 |
| | Electives | 4 |

And 6 hours from the following:

| | | |
|-----------|-----------------------------------|---|
| ECON 530 | Money and Banking | 3 |
| ECON 620 | Labor Economics | 3 |
| ACCTG 312 | Cost Accounting | 3 |
| MANGT 530 | Industrial Relations | 3 |
| MANGT 531 | Personnel and Wage Administration | 3 |
| MKTG 450 | Consumer Behavior | 3 |
| MKTG 542 | Sales Management | 3 |
| MANGT 630 | Labor Relations Law | 3 |
| FINAN 650 | Capital Budgeting | 3 |
| IE 501 | Industrial Management | 3 |

Chemistry option (B)

| | | |
|-----------|-----------------------------------|---|
| GRSC 505 | Cereal and Feed Analysis | 3 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Lab | 2 |
| CHM 271 | Chemical Analysis | 4 |
| CHM 500 | Descriptive Physical Chemistry | 3 |
| CHM 531 | Organic Chemistry I | 3 |
| CHM 532 | Organic Chemistry I Lab | 2 |
| CHM 550 | Organic Chemistry II | 3 |
| CHM 551 | Organic Chemistry II Lab | 2 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| PHYS 213 | Engineering Physics I | 5 |
| PHYS 214 | Engineering Physics II | 5 |
| | Electives | 7 |

Operations option (C)

| | | |
|-----------|--|---|
| BIOCH 120 | Introduction to Organic and Biological Chemistry | 5 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| ATM 563 | Electrical Systems and Controls | 3 |
| ME 212 | Engineering Graphics I | 2 |
| PHYS 213 | Engineering Physics I | 5 |
| PHYS 214 | Engineering Physics II | 5 |
| CE 231 | Statics A | 3 |
| CE 331 | Strength of Materials A | 3 |
| IE 501 | Industrial Management | 3 |
| ME 513 | Thermodynamics I | 3 |
| | Electives | 6 |

Feed science and management

Bachelor of science in feed science and management—127 semester hours

Freshman

Fall semester

| | | |
|-----------|--------------------------------|-----------|
| GENAG 101 | Ag Orientation | 1 |
| GRSC 100 | Principles of Milling | 3 |
| CHM 210 | Chemistry I | 4 |
| ENGL 100 | English Composition I | 3 |
| MATH 100 | College Algebra | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| | | 15 |

Spring semester

| | | |
|----------|------------------------|-----------|
| CHM 230 | Chemistry II | 4 |
| ENGL 120 | English Composition II | 3 |
| MATH 150 | Plane Trigonometry | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | Required courses* | 3 |
| | | 15 |

Sophomore

Fall semester

| | | |
|----------|-----------------------|-----------|
| GRSC 110 | Flow Sheets | 2 |
| BIOL 198 | Principles of Biology | 4 |
| ECON 110 | Economics I | 3 |
| | Required courses* | 7 |
| | | 16 |

Spring semester

| | | |
|----------|---------------------------|-----------|
| ASI 318 | Fundamentals of Nutrition | 3 |
| BIOL 455 | General Microbiology | 4 |
| | Social science electives | 6 |
| | Required courses* | 4 |
| | | 17 |

Junior

| | |
|----------------------|---|
| Fall semester | |
| GRSC 510 | Feed Technology I 4 |
| GRSC 661 | Qualities of Feed and Food Ingredients 3 |
| Required courses* | 9 |
| | 16 |

Spring semester

| | |
|-------------------|-------------------------------|
| GRSC 651 | Feed Plant Sanitation 4 |
| GRSC 750 | Feed Technology II 4 |
| Required courses* | 8 |
| | 16 |

Senior

| | |
|----------------------|--|
| Fall semester | |
| GRSC 650 | Concepts of Modern Feed Mill Design 3 |
| Required courses* | 13 |
| | 16 |

Spring semester

| | |
|-------------------|--|
| GRSC 505 | Cereal and Feed Analysis 3 |
| GRSC 610 | Electricity and Control for Milling Processes 3 |
| GRSC 630 | Management Applications 3 |
| Required courses* | 7 |
| | 16 |

*Including specialization electives

Required courses

| | |
|----------------------------|---|
| AGEC 520 | Grain Marketing 3 |
| BIOCH 120 | Introduction to Organic and Biological Chemistry 5 |
| MATH 205 | General Calculus and Linear Algebra 3 |
| PHYS 113 | General Physics I 4 |
| PHYS 114 | General Physics II 4 |
| STAT 320 | Elements of Statistics 3 |
| CIS 200 | Fundamentals of Computer Programming 4 |
| or | |
| Equivalent computer course | 3-5 |
| ACCTG 211 | Financial Accounting 3 |

Specialization electives

| | |
|----------------|--|
| GENAG 390 | Agricultural Employment 1 |
| ENGL 516 | Written Communication for the Sciences 3 |
| GRSC 591 | Commercial Feed and Food Manufacturing Internship 2 |
| GRSC 655 | Flour and Feed Mill Construction 3 |
| GRSC 751 | Air Handling in Grain Processing .. 3 |
| GRSC 790 | Grain Science Problems 2 |
| ECON 530 | Money and Banking 3 |
| MATH 220 | Analytic Geometry and Calculus I .. 4 |
| MATH 221 | Analytic Geometry and Calculus II 4 |
| ACCTG 221 | Managerial Accounting 3 |
| ACCTG 312 | Cost Accounting 3 |
| FINAN 450 | Business Finance 3 |
| MANGT 390 | Business Law I 3 |
| MANGT 530 | Industrial and Labor Relations 3 |
| MANGT 531 | Personnel and Wage Administration 3 |
| MANGT 630 | Labor Relations Law 3 |
| MKTG 542 | Sales Management 3 |
| IE 501 | Industrial Management 3 |
| Free electives | 6 |

Milling science and management

Bachelor of science in milling science and management—130 semester hours

Freshman

| | |
|----------------------|--|
| Fall semester | |
| GENAG 101 | Ag Orientation 1 |
| GRSC 100 | Principles of Milling 3 |
| CHM 210 | Chemistry I 4 |
| ENGL 100 | English Composition I 3 |
| MATH 100 | College Algebra 3 |
| PE 101 | Principles of Physical Fitness 1 |
| | 15 |

Spring semester

| | |
|-------------------|--------------------------------|
| CHM 230 | Chemistry II 4 |
| ENGL 120 | English Composition II 3 |
| MATH 150 | Plane Trigonometry 3 |
| SPCH 105 | Public Speaking IA 2 |
| ME 212 | Engineering Graphics I 2 |
| Option A, B, or C | 3 |
| | 17 |

Sophomore

| | |
|----------------------|---|
| Fall semester | |
| GRSC 110 | Flow Sheets 2 |
| BIOL 198 | Principles of Biology 4 |
| ECON 110 | Economics I 3 |
| CIS 110 | Introduction to Personal Computing 3 |
| Option A, B, or C | 4 |
| | 16 |

Spring semester

| | |
|--------------------------|------------------------------|
| GRSC 500 | Milling Technology I 4 |
| BIOL 455 | General Microbiology 4 |
| Social science electives | 6 |
| Option A, B, or C | 3 |
| | 17 |

Junior

| | |
|--------------------------|--------------------------------|
| Fall semester | |
| AGRON 340 | Market Grading Cereals 2 |
| Social science electives | 3 |
| Option A, B, or C | 12 |
| | 17 |

Spring semester

| | |
|-------------------|--------------------------------|
| GRSC 602 | Cereal Science 3 |
| STAT 320 | Elements of Statistics 3 |
| Option A, B, or C | 10 |
| | 16 |

Senior

| | |
|----------------------|------------------------------|
| Fall semester | |
| GRSC 635 | Baking Science I 2 |
| GRSC 636 | Baking Science I Lab 2 |
| Option A, B, or C | 12 |
| | 16 |

Spring semester

| | |
|-------------------|---------------------------------------|
| GRSC 651 | Food and Feed Plant Sanitation 4 |
| Option A, B, or C | 12 |
| | 16 |

Administration option (A)

| | |
|-----------|---|
| AGEC 520 | Grain Marketing 3 |
| GRSC 505 | Cereal and Feed Analysis 3 |
| GRSC 640 | Advanced Flow Sheets 2 |
| GRSC 655 | Flour and Feed Mill Construction .. 3 |
| GRSC 730 | Milling Technology II (Lecture) 2 |
| GRSC 785 | Advanced Flour and Feed Technology 3 |
| GRSC 630 | Management Applications 3 |
| BIOCH 120 | Introduction to Organic and Biological Chemistry 5 |
| ECON 120 | Economics II 3 |
| MATH 205 | General Calculus and Linear Algebra 3 |
| PHYS 113 | General Physics I 4 |
| PHYS 114 | General Physics II 4 |
| ACCTG 211 | Financial Accounting 3 |
| Electives | 6 |

And 9 hours from the following:

| | |
|-----------|--|
| ACCTG 221 | Managerial Accounting 3 |
| ECON 530 | Money and Banking 3 |
| ACCTG 312 | Cost Accounting 3 |
| MANGT 390 | Business Law I 3 |
| MANGT 420 | Management Concepts 3 |
| MANGT 530 | Industrial Relations 3 |
| MANGT 531 | Personnel and Wage Administration 3 |
| MKTG 450 | Consumer Behavior 3 |
| MKTG 542 | Sales Management 3 |
| MANGT 630 | Labor Relations Law 3 |
| FINAN 450 | Business Finance 3 |
| FINAN 650 | Capital Budgeting 3 |
| IE 501 | Industrial Management 3 |

Chemistry option (B)

| | |
|-----------|--|
| GRSC 505 | Cereal and Feed Analysis 3 |
| GRSC 625 | Flour and Dough Testing 3 |
| BIOCH 521 | General Biochemistry 3 |
| BIOCH 522 | General Biochemistry Lab 2 |
| CHM 271 | Chemical Analysis 4 |
| CHM 500 | Descriptive Physical Chemistry 3 |
| CHM 531 | Organic Chemistry I 3 |
| CHM 532 | Organic Chemistry I Lab 2 |
| CHM 550 | Organic Chemistry II 3 |
| CHM 551 | Organic Chemistry II Lab 2 |
| MATH 220 | Analytic Geometry and Calculus I .. 4 |
| MATH 221 | Analytic Geometry and Calculus II 4 |
| PHYS 213 | Engineering Physics I 5 |
| PHYS 214 | Engineering Physics II 5 |
| Electives | 10 |

Operations option (C)

| | |
|-----------|---|
| GRSC 640 | Advanced Flow Sheets 2 |
| GRSC 655 | Flour and Feed Mill Construction .. 3 |
| GRSC 730 | Milling Technology II 4 |
| GRSC 785 | Advanced Flour and Feed Technology 3 |
| BIOCH 120 | Introduction to Organic and Biological Chemistry 5 |
| MATH 210 | Technical Calculus I 3 |
| MATH 211 | Technical Calculus II 3 |
| ET 431 | Electrical Circuit Technology 4 |
| ET 550 | Industrial Microprocessing 3 |
| GRSC 630 | Management Applications in Grain Processing Industries 3 |
| PHYS 213 | Engineering Physics I 5 |
| PHYS 214 | Engineering Physics II 5 |
| CE 231 | Statics A 3 |
| CE 331 | Strength of Materials A 3 |
| Electives | 7 |

Graduate study

Major work leading to the degrees master of science and doctor of philosophy is offered in specialized administration, chemical, and engineering fields related to baking, feed, and grain milling. Requirements for entering graduate study in grain science are: mathematics, including college algebra; analytical chemistry; organic chemistry; a course in physics; a course in a biological science. When the committee believes it necessary, students will be required to take additional undergraduate courses to prepare them more completely for their programs.

Modern teaching and research facilities include a pilot bakery, feed mill, pilot flour mill, and a state-of-the-art Extrusion Research Center. Associated laboratories permit the study of the physical, chemical, and biochemical properties of cereals and related products.

Graduates are prepared for positions of responsibility in the baking, feed, and milling industries.

Undergraduate credit

GRSC 100. Principles of Milling. (3) I, II. Introduction to flour and feed milling processes. Two hours lec. and three hours lab a week. Pr.: One and one-half units of high school algebra. GRSC-100-1-4-0199

GRSC 110. Flow Sheets. (2) I, II. The construction and assembling of a flow sheet. Six hours lab a week. Pr.: GRSC 100, ME 212. GRSC-110-1-0199

GRSC 120. Introductory Bakery Technology. (2) II. An introduction to bakery science and technology. The processes used to produce baked goods on a large scale are emphasized. The products discussed include breads, dinner rolls, buns, sweet rolls, cakes, pastries,

doughnuts, crackers, and cookies. Films and tours of bakeries are used to introduce students to the equipment and operations used to manufacture baked goods. Two hours lec. a week. Pr.: MATH 100. GRSC-120-1-0197

GRSC 121. Introductory Bakery Technology Laboratory. (1) II. This course provides experience in the production of various types of bakery foods, including: breads, white and dark; layer cakes; foam cakes; danish pastry; puff pastry; pies; and donuts. Formulations and functions of ingredients used to make these products will be discussed. Processing equipment designed to efficiently produce bakery foods will be studied and operated by the students. Three hours lab a week. Pr.: GRSC 120 or conc. enrollment. GRSC-121-1-0-0197

GRSC 305. Fundamentals of Food Processing. (3) II. The study of some basic ingredients used in food processing, principles of preserving and processing of foods, and food packaging. Pr.: A course in chemistry. GRSC-305-0-0198

Undergraduate and graduate credit in minor field

GRSC 500. Milling Technology I. (4) II. Principles and practices of wheat flour milling with full-scale equipment including grain storage, blending, cleaning, conditioning plant, and a modern pneumatic 240 hundred weight flour mill, with instrumentation and air conditioning, etc. Two hours lec. and six hours lab a week. Pr.: GRSC 100 and 110. GRSC-500-1-0199

GRSC 505. Cereal and Feed Analysis. (3) II. Methods of analyzing and testing cereal grains, cereal, and feed products. One hour lec. and six hours lab a week. Pr.: CHM 230 and BIOCH 120. GRSC-505-1-0198

GRSC 510. Feed Technology I. (4) I. Introduction to the engineering of formula feed manufacture, including principles of conveying, grinding, mixing, pelleting, and the formulation of concentrates, premixes, and rations using a digital computer. Three hours lec. and three hours lab a week. Pr.: ASI 318 and GRSC 110. GRSC-510-1-0198

GRSC 591. Commercial Feed and Food Manufacturing Internship. (2) I. A practical application of feed and food manufacturing technology during an eight-week summer internship with an active commercial feed and food manufacturing company. The course will stress applied aspects of commercial feed and food manufacturing, which can include, but not be limited to, plant operations, maintenance, personnel and labor relations, business management, warehousing, ingredient procurement, quality assurance, and fleet management. Pr.: GRSC 510 or GRSC 500 or GRSC 635. GRSC-591-2-0199

Undergraduate and graduate credit

GRSC 602. Cereal Science. (3) I, II. The characteristics of cereals, legumes, and their products. Three hours lec. a week. Pr.: BIOCH 120. GRSC-602-0-0198

GRSC 610. Electricity and Control for Milling Processes. (3) II. Major emphasis will be given to application of electricity to machinery for grain processing and electrical code. Two hour lec., two hour lab. Pr.: Either GRSC 500, 510, or 635. GRSC-610-1-0198.

GRSC 625. Flour and Dough Testing. (3) II. Physical and chemical methods used in evaluating wheat flour and dough. One hour lec. and six hours lab a week. Pr.: GRSC 602. GRSC-625-1-0197

GRSC 630. Management Applications in the Grain Processing Industries. (3) II. This course deals with management principles and their specific application to the processing industries. Industry and allied trade personnel in management positions will give a number of lectures in their field of expertise. Special emphasis is placed on grain industry organizations, labor contracts, supervision, scheduling and planning, regulatory agencies, and cost control. Three hours lec. a week. Pr.: ECON I and either GRSC 510, GRSC 500, GRSC 120, or consent of instructor. Junior standing. GRSC-630-0-0112

GRSC 635. Baking Science I. (2) I. Introduction to properties of ingredients used in baking, reactions of ingredients during processing into baked products. Two hours lec. a week. Pr.: BIOCH 120. GRSC-635-0-0197

GRSC 636. Baking Science I Laboratory. (2) I, II. Laboratory exercises in theory and production of yeast-leavened baked products. Six hours lab a week. Pr.: GRSC 635 or conc. enrollment. GRSC-636-1-0197

GRSC 640. Advanced Flow Sheets. (2) II. Design of flow diagrams for dry milling processes. Uses a combination of methods that lead to practical applications and analytical techniques. Six hours lab a week. Pr.: GRSC 500 or 510. GRSC-640-1-0199

GRSC 650. Concepts of Modern Feed Mill Design. (3) I. Principles of modern feed mill design, feasibility, and equipment selection for plant improvements and new plant construction. Emphasis is placed on the effects of design on plant operating efficiency, product quality, and manufacturing costs. Pr.: GRSC 510, junior standing. GRSC-650-0-0198

GRSC 651. Food and Feed Plant Sanitation. (4) II. Sanitation in relation to processing, handling, and storage of human and animal foods. Emphasis on contaminants, control of causative agents, equipment and plant design, applicable laws and regulations. Three hours lec. and three hours lab a week. Pr.: Minimum of eight hours of biological science; junior standing. GRSC-651-1-0198

GRSC 655. Flour and Feed Mill Construction. (3) I. Mill engineering practices including sheet metal drafting, design of power transmission drives with belts, chains, and gears, and layout of new installations in existing plants. Design and layout of a grain or feed mill. Nine hours lab a week. Pr.: GRSC 500 or 510. GRSC-655-1-0199

GRSC 661. Qualities of Feed and Food Ingredients. (3) I. Physical and nutritional properties of feed and food ingredients and the effects of origin, processing, storage, and other factors upon them. Three hours lec. a week. Pr.: BIOCH 120. GRSC-661-0-0198

GRSC 670. Bakery Layout. (1) I. Equipment used to produce bakery foods is studied, and the students prepare a bakery layout. Two-hour lab. Pr.: PHYS 113, and GRSC 635 and GRSC 636. GRSC-670-1-0197

GRSC 705. Nutritional Properties of Cereals and Legumes. (3) II. Special emphasis is given to the nutritional properties of grains and legumes and their processed products. Pr.: BIOCH 521, GRSC 602, or conc. enrollment. GRSC-705-0-0196

GRSC 710. Fundamentals of Grain Storage. (2) I. Interrelationships of moisture, molds, and insects in grain and products in storage; changes occurring in storage; proper drying, storage, control of insects, rodents, birds. Pr.: GRSC 602 or 661. GRSC-710-0-0199

GRSC 711. Principles of Food Analysis. (3) II. Principles of instrumentation and analysis, with emphasis on applications to quality control and research in the food industry. Pr.: CHM 271 or GRSC 505 and BIOCH 120. GRSC-711-0-0198

GRSC 715. Fundamentals of Processing Grains for Food. (3) I. Unit processes in the receiving and storing of grains: grinding, sifting, mixing, conveying, cooling, drying air qualities, air flow, compaction, extrusion, etc. This course is not open to undergraduate majors in the department. Two hours lec. and three hours lab a week. Pr.: A course in physics. GRSC-715-1-0198

GRSC 725. Feed Manufacturing Processes. (3) II. Study of the technical phases of formula feed manufacturing, equipment design and function, effect of processing and ingredients on nutritional acceptability of feeds and quality control. Two hours lec. and three hours lab a week. Pr.: MATH 100, 150, and ASI 318. GRSC-725-1-0198

GRSC 730. Milling Technology II. (2) I. Advanced studies of the entire gradual reduction system of wheat flour milling and the many unit process systems that constitute the milling system. The theory and prac-

tices of wheat conditioning, drying, and aeration are elaborated upon. Two hours lec. a week. Pr.: GRSC 500. GRSC-730-0-0199

GRSC 731. Milling Technology II Laboratory. (2) I. The processes for milling other grains such as corn, oats, sorghum, different classes of wheat, and rye are studied in theory and by practice on small-scale laboratory milling units. Six hours lab a week. Pr. GRSC 730 or conc. enrollment. GRSC-731-1-0199

GRSC 737. Baking Science II. (2) II. Advanced study of the basic properties, chemical and biological reactions of ingredients used in production of bakery products. Special emphasis is placed on the fundamental principles of biological and chemical leavening and the rheological properties of dough batters and ingredients. Two hours lec. a week. Pr.: GRSC 635. GRSC-737-0-0197

GRSC 738. Baking Science II Laboratory. (1) II. A laboratory course to accompany GRSC 737. Three hours lab a week. Pr.: GRSC 737 or conc. enrollment. GRSC-738-1-0197

GRSC 750. Feed Technology II. (4) II. Advanced study of engineering principles of feed plant production, materials handling, grinding, pelleting, and other major processing operations. Three hours lec. and three hours lab a week. Pr.: GRSC 510, PHYS 114 or 214, and one course each in statistics and computer programming. GRSC-750-1-0198

GRSC 751. Air Handling in Grain Processing. (3) II. Emphasis is given to pneumatic conveying, exhaust systems, and air handling in the grain processing industry. Two hours lec. and three hours lab a week. Pr.: MATH 210 and PHYS 213. GRSC-751-0-0199

GRSC 785. Advanced Flour and Feed Technology. (3) II. Design and use of exhaust systems, pneumatic conveying systems, bins and hoppers, and the practical applications of electrical interlocking, instrumentation, and microprocessors to automatic mill control. Also other subjects such as sound measurement and explosion detection and prevention are covered. Two hours lec. and three hours lab a week. Pr.: GRSC 730 or 750. GRSC-785-1-0199

GRSC 790. Grain Science Problem. (Var.) I, II, S. Pr.: Consent of staff. GRSC-790-3-0196

Graduate credit

GRSC 801. Enzyme Applications. (2) I. Theories of enzyme action and function; commercial methods of manufacture and industrial uses, with special emphasis on the role of enzymes in the food industries. Two hours lec. a week. Pr.: BIOCH 521 and 522. GRSC-801-0-0196

GRSC 810. Advanced Cereal Chemistry. (3) II. The chemistry of cereal components at the molecular level. The role and interactions of the various constituents, their functionality in producing an end product, and their influence on nutritional properties. Three hours lec. a week. Pr.: BIOCH 521 and GRSC 602. GRSC-810-0-0198

GRSC 899. Research in Grain Science. (Var.) I, II, S. Research may be used as basis for the M.S. thesis. Pr.: Consent of staff. GRSC-899-4-0196

GRSC 900. Graduate Seminar in Grain Science. (1) I, II. Discussion of technical problems in the cereal industry. One hour lec. a week. Attendance required of all graduate students in grain science. GRSC-900-2-0196

GRSC 901. Starch Chemistry and Technology. (2) II. Offered 1991-92 and alternate years. Chemical and physical properties of cereal and legume starches. Isolation, structure, assay methods, and properties in solution. Methods of modifying starches for industrial use, including chemical, physical, and enzymic modifications. Pr.: BIOCH 521, GRSC 602. GRSC-901-0-0196

GRSC 910. Topics in Grain Science. (Var.) I, II, S. Discussions and lectures on important areas and contributions in the field of grain science not currently covered in present courses. Pr.: Consent or instructor. GRSC-910-0-0196

GRSC 999. Research in Grain Science. (Var.) I, II, S. Research may be used as basis for Ph.D. dissertation. Pr.: Consent of staff. GRSC-999-4-0196

Horticulture

P. H. Jennings, Head

Professors Clayberg,* Jennings,* Leuthold, Marr,* Mattson,* Morrison,* Pair,* and van der Hoeven; Associate Professors Albrecht,* Hensley,* Khatamian,* Kimmins, Long,* Rajashekar,* and Wiest;* Assistant Professors Allison, Gast, Gaussoin,* Hellman,* and Nus;* Instructor Reid; Emeriti: Professors Campbell, Greig, and Keen.

Undergraduate study

The Department of Horticulture offers two four-year curricula (horticulture and horticultural therapy) and one two-year program (retail floriculture). The department also helps administer and advises students in two interdepartmental programs. These are the crop protection curriculum and the food science and industry curriculum.

Horticulture (four-year curriculum)

Bachelor of science in agriculture—
127 semester hours

Horticulture is the science and art of growing plants for intensive food production, aesthetic value, environmental improvement, or social-therapeutic effects. Students, in consultation with faculty advisors, may select courses of study in horticultural industries or horticultural science.

All students in the curriculum are required to take a core of general courses in addition to the agricultural and horticultural courses. Within each option the student is advised to take specific courses and restricted electives necessary for career goals.

General education requirements

| | | |
|-----------|-----------------------------------|-----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| MATH 100 | College Algebra* | 3 |
| ECON 110 | Economics I | 3 |
| CHM 210 | Chemistry I | 4 |
| | or | |
| CHM 110 | General Chemistry | 5 |
| BIOL 210 | General Botany | 4 |
| | or | |
| BIOL 198 | Principles of Biology | 4 |
| PE 101 | Principles of Physical Fitness | 1 |
| | Humanities and/or social sciences | 9 |
| | Communications electives | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| | Organic chemistry** | 3-5 |

| | | |
|---|--------------------|---|
| Mathematics/statistics/ computer science electives | 3-4 | |
| BIOL 500 | Plant Physiology** | 4 |

*Students in the science option take calculus

**Students in landscape design suboption take a surveying elective (3 hours) and have a biology elective of 3-4 hours.

Horticulture and agriculture requirements for science and industries options

| | | |
|-----------|-------------------------------|-----|
| GENAG 101 | Ag Orientation | 1 |
| HORT 110 | Introduction to Horticulture* | 1 |
| HORT 200 | Plant Science | 4 |
| AGRON 305 | Soils | 4 |
| | Entomology electives | 3-4 |
| PLPTH 500 | Principles of Plant Pathology | 3 |

*Required of all freshman and sophomore majors

Horticultural science option

The horticultural science option trains undergraduates in horticulture for professional positions requiring advanced degrees. Students in this option receive a horticultural background with additional emphasis in physical and biological sciences. Students electing this option take the general education requirements, the horticulture and agriculture requirements and the following additional requirements:

| | | |
|-----------|---------------------------------------|----|
| ASI 500 | Genetics | 3 |
| CHM 230 | Chemistry II | 4 |
| PHYS 115 | Descriptive Physics | 4 |
| | Calculus electives | 3 |
| STAT 340 | Biometrics I | 3 |
| | Computer science elective | 4 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 525 | General Plant Biochemistry Lab | 2 |
| BIOL 500 | Plant Physiology | 4 |
| HORT 520 | Fruit Production | 3 |
| HORT 560 | Vegetable Crop Production | 3 |
| HORT 570 | Greenhouse Management | 3 |
| | Horticulture specialization electives | 17 |
| | Free electives | 16 |

Horticultural industries option

The horticultural industries option trains students interested in the production and maintenance of horticultural crops and the related businesses. Students receive a broad background in horticulture and concentrate in one of six horticultural specializations: fruit/vegetable, greenhouse, landscape management, landscape design, operations, nursery, and turf. Requirements in addition to general education and agriculture are as follows:

| | | |
|----------|----------------------------|------|
| HORT 350 | Plant Propagation | 3 |
| HORT 520 | Fruit Production* | 3 |
| HORT 560 | Vegetable Crop Production* | 3 |
| HORT 612 | Turf Management | 3 |
| | Business electives | 9 |
| | Free electives | 8-13 |

*In turf, landscape design, and landscape management, students take either HORT 520 or HORT 560.

Other requirements for the different suboptions are:

| | | |
|--|---------------------------------------|----|
| Fruit/vegetable suboption | | |
| HORT 570 | Greenhouse Management | 3 |
| HORT 575 | Nursery Management | 3 |
| HORT 582 | Pesticide Application Technology | 3 |
| | Horticulture specialization electives | 20 |
| Greenhouse management suboption | | |
| HORT 460 | Bedding and Foliage Plants | 4 |
| HORT 570 | Greenhouse Management | 3 |
| HORT 575 | Nursery Management | 3 |
| HORT 582 | Pesticide Application Technology | 3 |

| | | |
|----------|---------------------------------------|----|
| HORT 625 | Floriculture | 4 |
| | Horticulture specialization electives | 12 |

Landscape management suboption

| | | |
|----------|---------------------------------------|----|
| HORT 374 | Woody Plant Material I | 3 |
| HORT 375 | Woody Plant Material II | 3 |
| HORT 450 | Landscape Development | 3 |
| HORT 508 | Landscape Maintenance | 3 |
| | Horticulture specialization electives | 20 |

Landscape design suboption

| | | |
|----------|--|----|
| HORT 374 | Woody Plant Material I | 3 |
| HORT 375 | Woody Plant Material II | 3 |
| HORT 450 | Landscape Development | 3 |
| HORT 508 | Landscape Management | 3 |
| ENVD 205 | Design Graphics I | 3 |
| | or | |
| ENVD 212 | Studio for Environmental Design and Graphics | 3 |
| | or | |
| ENVD 560 | Accelerated Design and Graphics | 3 |
| | Horticulture specialization electives | 17 |

Nursery management suboption

| | | |
|-----------|---------------------------------------|----|
| AGRON 330 | Weed Management | 3 |
| HORT 374 | Woody Plant Material I | 3 |
| HORT 375 | Woody Plant Material II | 3 |
| HORT 570 | Greenhouse Management | 3 |
| HORT 575 | Nursery Management | 3 |
| HORT 582 | Pesticide Application Technology | 3 |
| | Horticulture specialization electives | 11 |

Turf management suboption

| | | |
|-----------|---------------------------------------|----|
| HORT 460 | Bedding and Foliage Plants | 4 |
| HORT 374 | Woody Plant Material I | 3 |
| HORT 582 | Pesticide Application Technology | 3 |
| HORT 617 | Turfgrass Management Lab | 2 |
| AGRON 315 | Soil Fertility | 3 |
| | Horticulture specialization electives | 17 |

Horticultural therapy (four-year curriculum)

Bachelor of science in agriculture—
127 semester hours

The first horticultural therapy undergraduate training program in the United States was developed in 1971 in a cooperative agreement between Kansas State University and the Menninger Foundation, Topeka, Kansas. Courses are required in general education, horticulture and agriculture, horticultural therapy, and humanities and/or social sciences. Specialization electives may be selected in community-based programs, corrections, gerontology, education, developmental disabilities, or mental health. Clinical internships are required during the senior year at approved psychiatric hospitals, rehabilitation centers, veterans administration hospitals, correctional agencies, geriatric and retirement centers, or community-based agencies. The requirements of the curriculum are as follows:

General education requirements

| | | |
|-----------|--------------------------------|-----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| GENAG 101 | Ag Orientation | 1 |
| | or | |
| HORT 110 | Introduction to Horticulture | 1 |
| MATH 100 | College Algebra | 3 |
| ECON 110 | Economics I | 3 |
| CHM 110 | General Chemistry | 5 |
| BIOL 210 | General Botany | 4 |
| PE 101 | Principles of Physical Fitness | 1 |
| PE 375 | First Aid-Multi/CPR | 1 |
| | STAT or CIS elective | 3-4 |

Horticulture and agriculture requirements

| | | |
|----------------------------------|--|-----|
| HORT 180 | Basic Floral Design Concepts | 3 |
| HORT 200 | Plant Science | 4 |
| HORT 255 | Introduction to Horticultural Therapy | 1 |
| HORT 460 | Bedding and Foliage Plants | 4 |
| HORT 374 | Woody Plant Materials I | 3 |
| HORT 400 | Plant Propagation | 3 |
| Ornamental horticulture elective | | 2-4 |
| HORT 520 | Fruit Production | 3 |
| HORT 525 | Horticulture for Special Populations | 3 |
| HORT 530 | Horticultural Therapy Seminar | 1 |
| HORT 535 | Horticultural Therapy Field Techniques | 3 |
| HORT 560 | Vegetable Crop Production | 3 |
| HORT 570 | Greenhouse Management | 3 |
| AGRON 305 | Soils | 4 |
| PLPTH 500 | Principles of Plant Pathology | 3 |
| Entomology electives | | 2-4 |

Humanities and/or social science requirements

| | | |
|--------------------------|--|----|
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| Group methods elective | | 3 |
| PSYCH 505 | Abnormal Psychology | 3 |
| EDAF 215 | Educational Implications of Growth and Development | 3 |
| Art electives | | 2 |
| Specialization electives | | 15 |

Internship requirement

| | | |
|-----------|---|-----|
| HORT 540 | Horticultural Therapy Field Experiences | 12 |
| Electives | | 6-8 |

Retail floriculture (four semesters)**Associate of agriculture degree**

This is a technical program combining supervised practical training with University course work in preparation for employment and management in a retail flower shop. The first phase of instruction is at Kansas State University, where the course sequence is completed during four semesters. In the program the student serves an apprenticeship at a selected retail florist business. Every effort is made to approve a florist shop in a city of the student's choice. The apprentice will be an employee of the flower shop during one semester of training and will receive a salary sufficient to meet normal living expenses.

First semester (fall)

| | | |
|----------|---------------------------------------|----|
| BIOL 210 | General Botany | 4 |
| HORT 110 | Introduction to Horticulture | 1 |
| HORT 180 | Basic Floral Design Concepts | 3 |
| HORT 255 | Introduction to Horticultural Therapy | 1 |
| HORT 325 | Indoor Plants and Flowers | 2 |
| ART 100 | Design I | 2 |
| PE 101 | Principles of Physical Fitness | 1 |
| | | 14 |

Second semester (spring)

| | | |
|-------------------------|-----------------------|----|
| HORT 200 | Plant Science | 4 |
| HORT 299 | Flower Judging | 1 |
| ART 200 | Design II | 2 |
| ECON 110 | Economics I | 3 |
| ENGL 100 | English Composition I | 3 |
| Communications elective | | 3 |
| | | 16 |

Third semester (fall)

| | | |
|-----------|----------------------------|---|
| HORT 380 | Advanced Floral Design | 3 |
| ENGL 120 | English Composition II | 3 |
| PSYCH 110 | General Psychology | 3 |
| HORT 460 | Bedding and Foliage Plants | 4 |

| | | |
|----------|------------------------------------|-------|
| MATH 100 | College Algebra | 3 |
| or | | |
| CIS 110 | Introduction to Personal Computing | 3 |
| | | 15-16 |

Summer term

| | | |
|----------|------------------------------------|---|
| HORT 290 | Florist Shop Management Internship | 1 |
|----------|------------------------------------|---|

Fourth semester (spring)

| | | |
|-------------------------|-----------------------|----|
| HORT 570 | Greenhouse Management | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| Business electives | | 6 |
| Social science elective | | 3 |
| | | 15 |

Graduate study

Both the master of science and doctor of philosophy degrees are offered in the horticulture department in the fields of fruit and vegetable crops and in ornamental horticulture, including floriculture and turf science. The master of science degree is offered in the field of horticultural therapy. Specialization areas for the master of science and doctor of philosophy degrees include: crop physiology, growth regulators, herbicides/weed management, nutrition/fertility, soil/plant relationships, stress physiology, breeding/genetics, and food science. The last two of these are interdepartmental programs.

Specialization areas for the master of science degree in horticultural therapy include community programs, corrections, developmental disabilities, education, gerontology, and mental health. A B.S. degree from a recognized college or university whose undergraduate program is substantially equivalent to the program at KSU is prerequisite to admittance to graduate work in this department.

The department has a variety of facilities for both undergraduate and graduate study and research. These include the orchards and vegetable plots at the horticultural farm, experimental fields, turf farm, greenhouses, cold storage units, controlled atmosphere chambers, and research laboratories equipped for scientific plant studies. Many horticulture courses require student visitations and work at these facilities.

Undergraduate credit

HORT 110. Introduction to Horticulture. (1) I. A survey of commodities and specialties in horticulture and the career opportunities they offer. One hour lec. a week, to be taught by specialists in each area. Required of freshman and sophomore majors and open to all nonmajors. HORT-110-0-0108

HORT 153. Home Horticulture. (2) II. An introduction to the basic concepts and practices of horticulture. Culture, use, and relationships of horticultural plants in the garden, yard, and home are stressed. Two hours of lec. a week. For nonmajor students only. HORT-153-0-0109

HORT 155. Home Horticulture Laboratory. (1) II. The application of horticultural practices with emphasis on the establishment, maintenance, and use of horticultural plants in and around the home. Three hours lab a week. Pr.: HORT 153 or conc. enrollment. HORT-155-1-0109

HORT 180. Basic Floral Design Concepts. (3) I. An introduction to the use of flowers and related products with emphasis on fundamentals of design. Two hours rec. and three hours studio a week. For majors or nonmajors. HORT-180-I-0109

HORT 200. Plant Science. (4) II. Study of the production principles of economic plants, including morphology, taxonomy, physiology, ecology, propagation, preservation, storage, and utilization. Three hours lec. and one two-hour lab a week. HORT-200-0-0108

HORT 255. Introduction to Horticultural Therapy. (1) I, II. Introduction to horticultural therapy programs, activities, and resources. Orientation to the profession, roles, and functions of horticultural therapists, and to the broad range of skills required to work with psychiatric, developmentally disabled, geriatric, corrections, and noninstitutional clients. One hour rec. a week. HORT-255-0-0108

HORT 290. Florist Shop Internship. (1) I, II, S. Principles of commercial florist shop operations including exposure to the multiple phases of work in a retail flower shop. Retail florist shops with wire services will be selected for the internship. HORT-290-2-0109

HORT 299. Flower Judging. (1) II. Principles of judging cut flowers, flowering potted plants, and foliage plants for flower shows and judging contests. Pr.: Consent of instructor. HORT-299-1-0109

HORT 325. Indoor Plants and Flowers. (2) I, II. The selection, culture, and use of plants in homes, schools, offices, and public buildings. Two hours lec. a week. No prerequisites. HORT-325-0-0109

HORT 333. Gardening for Food. (2) II. An introductory course on how to plant, culture, harvest, and store fruits and vegetables at home. Two hours rec. a week. Nonmajor. No prerequisites. HORT-333-0-0108

HORT 350. Plant Propagation. (3) I. Designed to develop proficiency in the various skills and techniques necessary for propagation of horticultural plants. Basic fundamentals of seed structure and vegetative make-up of plants are emphasized. Two hours rec. and three hours lab a week. Pr.: HORT 200. HORT-350-1-0109

HORT 374. Woody Plant Materials I. (3) I. Identification, ornamental characters, site requirements, and use of woody ornamental deciduous trees and shrubs with special emphasis on the cultivated varieties. Weekly labs consist of lengthy walking campus tours to identify plant specimens. Three hours lec. and two hours lab a week. Pr.: BIOL 210; HORT 200; or BIOL 198. HORT-374-0-0109

HORT 375. Woody Plant Materials II. (3) II. Identification, ornamental characters, site requirements, and use of woody ornamental conifers, broadleaf evergreens, vines, ground covers, deciduous flowering shrubs, and small- to medium-size flowering trees. Weekly labs consist of lengthy walking campus tours to identify plant specimens. Three hours lec. and two hours lab a week. Pr.: HORT 374. HORT-375-0-0109

HORT 380. Advanced Floral Design Concepts. (3) II. Stylized floral design and related management for the commercial florist shop, including corsages, wedding decorations, funeral pieces, and party/banquet decorations. Two hours rec. and three hours studio a week. Pr.: HORT 180. HORT-380-1-0109

HORT 390. Horticulture Topics. (Var.) I, II, S. Lectures and discussion of topics of importance to undergraduate majors. Pr.: Consent of instructor. HORT-390-3-0108

HORT 450. Landscape Development. (3) I. The location and arrangement of plants and other permanent features of the landscape around homes and other similar areas. Two hours lec. and two hours lab a week. Pr.: HORT 374 and HORT 375. HORT-450-1-0109

HORT 460. Bedding and Foliage Plants. (4) I. Identification of herbaceous annuals, biennials, and perennials found in the bedding plant industry and of tropical foliage plants used in the consumer and commercial interiorscape market. Discussion of production techniques, consumer care, and commercial maintenance. One hour rec., two hours lec., and one three-hour lab weekly. Pr.: BIOL 210, HORT 200. HORT-460-1-0109

Undergraduate and graduate credit in minor field

HORT 508. Landscape Maintenance. (3) II. Fundamental principles of maintaining ornamental plantings of trees, shrubs, perennials, and turf in the nursery, home grounds, parks, and similar areas. Three hours rec. a week. Pr.: HORT 374 and/or HORT 375. HORT-508-0-0109

HORT 520. Fruit Production. (3) I. Principles and practices of cultivating fruit and nut crops commercially and in the home grounds. Laboratory offers experiences in pomological practices. Two hours rec. and two hours lab a week. Pr.: HORT 200 or equiv. and HORT 350. HORT-520-1-0108

HORT 525. Horticulture for Special Populations. (3) I. An intensive study of the concepts and methods of using plants and gardening as therapeutic activities with developmentally disabled, geriatric, economically and socially disadvantaged, emotionally disturbed, or educationally deprived clients. Two hours rec. and two hours lab a week. Pr.: BIOL 210 or HORT 200. HORT-525-1-0109

HORT 530. Horticultural Therapy Seminar. (1) II. Guest lecturer and student presentations of topics relating to professionalism, current issues, or goals of horticultural therapy. The course is intended to help students focus expectations and assumptions about a professional career in horticultural therapy and to give them practice in articulating their understanding of the field. Pr.: HORT 255 and HORT 525. HORT-530-0-0109

HORT 535. Horticultural Therapy Field Techniques. (3) I, II. Students under supervision will plan, conduct, and evaluate horticultural therapy activities at Manhattan institutional sites selected according to student's interest. A weekly discussion session addresses evaluation and issues of professionalism. Two hours rec. and two hours lab a week. Pr.: HORT 525. HORT-535-1-0109

HORT 540. Horticultural Therapy Field Experiences. (12) I, II. Supervised training at institutions with horticultural therapy programs to gain experience in the application and use of horticultural activities for special populations. Six months intensive training provided within student's specialization. Pr.: HORT 535. HORT-540-2-0109

HORT 551. Landscape Contracting. (3) II, in odd years. The use, interpretation, and development of planting plans (including contracting, construction, and specifications) as applied to landscape horticulture. Two hours rec. and two hours lab a week. Pr.: HORT 374 and/or HORT 375. HORT-551-1-0109

HORT 560. Vegetable Crop Production. (3) II. Study of production principles and cultural practices involved in the growing of vegetable crops. Two hours lec. and two hours lab or field trips a week. Pr.: HORT 200. HORT-560-1-0108

HORT 570. Greenhouse Management. (3) I. Greenhouse construction, environmental control, crop scheduling, and management. Two hours rec. and three hours lab a week. Pr.: HORT 200. HORT-570-1-0109

HORT 575. Nursery Management. (3) II. A study of the various practices and methods of operating a commercial nursery for the production of ornamental woody plants used for landscaping purposes. Two hours rec. and three hours lab a week. Pr.: BIOL 210, HORT 200, HORT 350, and AGRON 305. HORT-575-1-0109

HORT 582. Pesticide Application Technology. (3) II. The equipment, procedures, and techniques used in applying pesticides. Emphasis is placed on types, theory, operation, calibration, and maintenance of application equipment. Two hours rec. and three hours lab a week. Pr.: HORT 200 or BIOL 210 and an entomology or weed science course. HORT-582-1-0108

HORT 585. Arboriculture. (3) I. Principles and practices of maintaining shade and ornamental trees under urban environments. Two hours rec. and three hours lab a week. Pr.: HORT 200 and HORT 374. HORT-585-0-0109

HORT 590. Horticulture Field Study. (1-4) I, II, S. Principles of commercial horticulture activity including exposure to multiple phases of the working horticulture enterprise. Students will be placed according to specific interest. For juniors and seniors in horticulture only. Pr.: HORT 200, plus one other core curriculum horticulture course. HORT-590-2-0108

Undergraduate and graduate credit

HORT 612. Turf Management. (3) I. Establishment and maintenance concepts for lawn and recreational turf. Three hours rec. a week. Pr.: HORT 200, AGRON 305. HORT-612-0-0109

HORT 617. Turfgrass Management Laboratory. (2) I. Practical aspects of turf management, including: turfgrass species and weed identification, site analysis and problem solving, equipment, and turf site construction methods. Two two-hour labs weekly. Pr.: HORT 612 or conc. enrollment. HORT-617-1-0109

HORT 625. Floriculture. (4) II, in odd years. The principles and commercial practices for producing greenhouse florist crops. The relationship is stressed between a plant's physiological response and its greenhouse environment. Aspects of postharvest physiology are also covered. Three hours lec. and two hours lab a week. Pr.: HORT 350 and HORT 570. HORT-625-0-0109

HORT 640. Horticultural Problems. (Var.) I, II, S. Problems and reports in floriculture, olericulture, ornamental horticulture, pomology, turfgrass, and horticultural therapy. Pr.: Consent of instructor. HORT-640-3-0109

HORT 700. Vegetable Crop Physiology. (3) I, in even years. Study of basic principles of applied physiology using specific vegetable crops as examples. Three hours lec. a week. Pr.: HORT 560, BIOL 500. HORT-700-0-0108

HORT 706. Turfgrass Science. (3) II. A study of environmental stresses on turfgrass growth and management. Microclimate effects on turf are studied. Temperature, moisture, aeration, light, traffic aspects are discussed. Three hours rec. a week. Pr.: HORT 612. HORT-706-0-0109

HORT 730. Fruit Science. (3) II. Detailed discussion of selected topics in fruit physiology. Three hours rec. a week. Pr.: HORT 520, BIOL 500. HORT-730-0-0109

HORT 740. Horticultural Plant Breeding. (3) I, in even years. Breeding methods and their application to the economic improvement of flowers, fruits, shrubs, trees, turfgrasses, and vegetables. Pr.: ASI 500 or equiv. HORT-740-0-0108

HORT 751. Advances in Horticultural Therapy. (3) I. New developments and applications of gardening or horticultural activities for special populations will be emphasized. Procedures for management of horticultural therapy programs, designing therapeutic or rehabilitation activities, and evaluation methods will be discussed. Reading of selected research publications relating to horticultural therapy will be assigned. Pr.: HORT 535. HORT-751-0-0108

HORT 780. Topics in Horticulture. (Var.) I, II, S. Discussion and lectures of important papers and contributions in this field. Pr.: Consent of instructor. HORT-780-3-0108

HORT 792. Handling and Processing Fruits and Vegetables. (3) I, in odd years. Field trips required. Principles of harvesting, grading, handling, nutritive value, and processing of fruits and vegetable crops. Pr.: BIOL 198 or equiv. and a course in organic chemistry or biochemistry. HORT-792-0-0108

Graduate credit

HORT 846. Plant Research Methods. (3) I. Review of history and forms of plant science literature. Discussion on selecting experimental procedures, interpreting data, and reporting results. Two hours rec. and two hours lab a week. Pr.: One statistics course or consent of instructor. HORT-846-1-0109

HORT 898. Master's Report. (2) I, II, S. Investigations in pomology, olericulture, floriculture, ornamental horticulture, turfgrass, or horticultural therapy for preparation of master's report. Pr.: Consent of instructor. HORT-898-4-0108

HORT 899. Research—M.S. (Var.) I, II, S. Investigations in pomology, olericulture, floriculture, ornamental horticulture, turfgrass, or horticultural therapy for preparation of master's thesis. Pr.: Consent of instructor. HORT-899-4-0108

HORT 910. Topics in Plant Breeding. (Var.) I, II, S. Discussion and lectures on important papers and contributions in this field. Same as AGRON 910. Pr.: Consent of instructor. HORT-910-0-0108

HORT 921. Horticultural Crop Nutrition. (2) I, in odd years. Nutritional requirements of horticultural crops and factors affecting these requirements. Review of current literature on horticultural crop nutrition. Two hours lec. or reports a week. Pr.: HORT 200, AGRON 305, and a plant physiology course. HORT-921-0-0108

HORT 940. Plant Regulators in Horticulture. (3) I, in even years. A study of synthetic plant regulators used to initiate, induce, promote, inhibit, or alter characteristics of horticultural plants and crops. Included are kinds and types of exogenous plant regulators used on crops, their activity, plant responses, benefits and problems, and application technology. One hour lec. and two hours rec. a week. Pr.: BIOCH 510 or BIOL 500, and one graduate plant commodity course. HORT-940-0-0108

HORT 951. Horticulture Graduate Seminar. (1) I, II. Student presentations and discussion of investigational works in the various branches of horticulture. HORT-951-0-0108

HORT 960. Environmental Plant Stress. (3) II, in odd years. Physiological, biochemical, and morphological factors involved in stress development and resistance will be discussed. Pr.: BIOL 800. HORT-960-0-0108

HORT 999. Research in Horticulture, Ph.D. (Var.) I, II, S. Investigations in pomology, olericulture, floriculture, ornamental horticulture, and turfgrass. Data collected may form basis for a thesis or dissertation. Pr.: Consent of instructor. HORT-999-4-0108

Plant Pathology

Fred W. Schwenk,* Head

Professors Claflin,* Gill,* Johnson,* Schwenk,* and Stuteville;* Associate Professors Bockus,* Hetrick,* and Pfender;* Assistant Professors Bowden,* Heaton,* Hulbert,* Jardine,* Leach,* Leslie,* Tisserat,* and White;* Instructor O'Mara; Assistant Instructor Todd; Adjunct Associate Professors Appel, Eversmeyer,* Sauer,* and Sim; Emeriti: Professors King and Willis;* Associate Professor Browder.*

Plant pathology is the study of plant diseases, their causes, effects, nature, and control. Opportunities for graduates in plant pathology include basic and applied research, development, and teaching.

Undergraduate study

Bachelor of science in agriculture under the crop protection curriculum, which includes a plant pathology science option.

Students interested in the broad aspects of plant disease and insect and weed control should consider the pest management or business and industries option of the crop protection curriculum. Students who wish to specialize in the study of plant diseases should consider the plant pathology science option of the crop protection curriculum, discussed below.

Students majoring in the plant pathology science option of the crop protection curriculum take the following courses in addition to the general requirements for the curriculum. See also information earlier in this college section.

Major courses

| | | |
|-----------|-------------------------------|---|
| BIOL 210 | General Botany | 4 |
| AGRON 305 | Soils | 4 |
| ENTOM 300 | Economic Entomology | 3 |
| | or | |
| ENTOM 312 | General Entomology | 2 |
| | and | |
| ENTOM 313 | General Entomology Lab | 1 |
| ASI 500 | Genetics | 3 |
| PLPTH 500 | Principles of Plant Pathology | 3 |
| BIOL 455 | Microbiology | 5 |
| BIOL 704 | Introductory Mycology | 4 |
| | Crop production elective | 3 |
| | Botanical science electives | 6 |

Math and science courses

| | | |
|----------|--------------------------------------|---|
| MATH 150 | Plane Trigonometry | 3 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| | Computer Language Lab (200 level) | 2 |
| STAT 340 | Biometrics I | 3 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| BIOL 500 | Plant Physiology | 4 |

One of the following:

| | | |
|-----------|---------------------------------|---|
| BIOCH 521 | General Biochemistry | 3 |
| | and | |
| BIOCH 522 | General Biochemistry Laboratory | 2 |

| | | |
|-----------|-------------------------|-------|
| BIOCH 755 | Biochemistry I | 3 |
| | and | |
| BIOCH 756 | Biochemistry Laboratory | 2 |
| | Free electives | 23-24 |

Graduate study

The graduate program in plant pathology leads to the master of science and doctor of philosophy degrees. Prerequisite to graduate study is possession of a bachelor's degree from an accredited college. Students often enter advanced work in plant pathology following a major in agronomy, biology, botany, horticulture, or similar area as well as plant pathology.

Areas of study include the major field crops in Kansas—wheat, corn, sorghum, alfalfa, and soybeans, plus horticultural plants (trees, turf, vegetables, fruits); the major pathogen groups (bacteria, fungi, nematodes, and viruses); and specialty areas (biological control, cell and tissue culture, classical and molecular genetics, cytogenetics, disease diagnosis, disease physiology, ecology and epidemiology, effects of tillage practices on disease, microbial ecology, mycorrhizae, plant transformation and regeneration, stored grain pathology). Plant biotechnology is a departmental strength. The department has an exceptionally strong series of invited seminar speakers.

Departmental facilities include well-equipped research and teaching laboratories, greenhouses, plant growth chambers, and field plots. Students have access to transmission and scanning electron microscopes, a computing center, herbarium, and science libraries. Graduate research assistantships or employment in departmental research projects may be available to outstanding students.

Undergraduate and graduate credit in minor field

PLPTH 500. Principles of Plant Pathology. (3) II. An introductory class in the nature of plant pathogens and the cause, effect, and control of plant diseases. Diseases of field and horticultural crops will be addressed. Two hours lec., one two-hour lab a week. Not open to students with credit for PLPTH 510 or PLPTH 520. Pr.: BIOL 198, 210 or equiv., and junior standing. PLPTH-500-1-0404

Undergraduate and graduate credit

PLPTH 607. Plant Disease Diagnosis. (2) II. Theory and principles, with laboratory and field practice, in plant disease diagnosis. Designed as an introduction to PLPTH 709. Four hours combined lec. and lab a week. Pr.: An introductory course in plant pathology. PLPTH-607-1-0404

PLPTH 613. Plant Disease Control. (3) I. Disease control strategies are developed in a practical manner. Control economics and practices are considered in relation to principles and current research. Biological, cultural, physical, chemical, and regulatory methods are discussed. Two hours lec., one two-hour lab a week. Pr.: PLPTH 500. PLPTH-613-1-0404

PLPTH 650. Plant Nematology. (3) II. An introduction to the morphology, taxonomy, and ecology of phytoparasitic and free-living nematodes found in plants, soil, and fresh water. Emphasis is on the identification and control of plant parasitic nematodes and on lab techniques used in their study. Two hours lec., one two-hour lab a week. Pr.: An introductory course in plant pathology. PLPTH-650-1-0404

PLPTH 709. Plant Disease Diagnosis Lab, Fall. (1) I, first half of the semester. Practical experience in diagnosing diseases of field crops and horticultural plants. Six hours lab a week. Diseases studied will be those available that term, emphasizing, but not restricted to, those in the student's area of interest. Overnight field trips may be required. Pr.: PLPTH 607 and BIOL 640. PLPTH-709-1-0404

PLPTH 735. Plant Virology. (3) I, in odd years. A study of the classification, etiology, epidemiology, molecular biology, genetics, and evolution of plant-infecting viruses, with emphasis on viruses and viral diseases of importance to Kansas. The laboratory will emphasize general research techniques and equipment usage, particularly transmission, symptomatology, serology, centrifugation, nucleic acid extraction, and electrophoresis of plant viruses. Two hours lec., one four-hour lab a week. Pr.: Genetics, General Biochemistry and lab, and an introductory course in plant pathology; or consent of instructor. PLPTH-735-1-0404

PLPTH 740. Plant Pathogenic Bacteria. (3) II, in odd years. The etiology, epidemiology, dissemination and survival, taxonomy, mechanisms of pathogenicity, serology, host-parasite relations, control measures, and principles and methods of identifying plant pathogenic bacteria. Lab sessions will be devoted to use of general lab equipment and research techniques. Six hours combined lec./lab a week. Pr.: General Biochemistry, introductory course in plant pathology. Enrollment limited to 12 students. PLPTH-740-1-0404

PLPTH 745. Plant Pathogenic Fungi. (3) I, in even years. The isolation, handling, storage, inoculation, terminology, and taxonomy of fungal pathogens of plants. Particular attention will be given to techniques used to study fungi and to the genus and species concepts for important plant pathogenic fungal genera. Two hours lec., one three-hour lab a week. Pr.: PLPTH 500 and BIOL 640. PLPTH-745-1-0404

PLPTH 750. Problems in Plant Pathology. (1-3) I, II, S. Work is offered in general plant pathology, plant virology, plant nematology, disease physiology, epidemiology, and disease diagnosis. Pr.: Background of courses needed for the problem undertaken. PLPTH-750-3-0404

PLPTH 760. Plant Pathology Methods. (3) I, in even years. Practical lab methods in manipulating plant pathogens with emphasis on the isolation, culture, identification, inoculation, and preservation of plant pathogenic bacteria and fungi. One hour lec. and five hours lab a week. Pr.: PLPTH 500 or equiv. Enrollment limited to 12 students. PLPTH-760-1-0404

Graduate credit

PLPTH 860. Host Plant Resistance to Disease. (2) II, in odd years. A consideration of basic and applied aspects of controlling plant disease through host plant resistance. The relationships of disease components are elucidated, and types and characteristics of plant disease resistances are considered. Methods of using disease resistance in crop production are developed. Two hours lec./discussion a week. Pr.: PLPTH 500 and ASI 500. PLPTH-860-0-0404

PLPTH 870. Seminar in Plant Pathology. (1) I, II. Reports in the field of plant pathology. Pr.: Consent of instructor. PLPTH-870-0-0404

PLPTH 898. Master's Report. (2) I, II, S. Pr.: Background of courses needed for the topic undertaken. PLPTH-898-4-0404

PLPTH 899. Research in Plant Pathology for the M.S. Degree. (Var.) I, II, S. Work is offered in general plant pathology, plant virology, plant nematology, disease physiology, and epidemiology. Pr.: Sufficient background to conduct the line of research undertaken. PLPTH-899-4-0404

PLPTH 905. Ecology and Epidemiology of Plant Pathogens. (3) II, in even years. This course deals with the ecological relationships of soilborne and foliar pathogens, as well as the biological and environmental factors which influence the spread of plant diseases. Three hours lec. a week. Pr.: PLPTH 500 and one of the following: PLPTH 735, PLPTH 740, PLPTH 745, or BIOL 704. PLPTH-905-0-0404

PLPTH 910. Plant Disease Physiology. (3) I, in odd years. A discussion of molecular and genetic perspectives of resistant and susceptible interactions between plants and bacterial, viral, and fungal pathogens. Current hypotheses on the nature of disease resistance will be evaluated. Three hours lec. a week. Pr.: PLPTH 500, BIOCH 521, and BIOL 500; BIOL 540 or ASI 500; and one of BIOL 800, PLPTH 735, PLPTH 740, or PLPTH 745. PLPTH-910-0-0404

PLPTH 911. Plant Tissue Culture and Regeneration. (3) II, in odd years. Plant tissue culture principles, techniques, and applications, with emphasis on plant regeneration from protoplasts and the use and potential of this procedure for crop improvement through genetic engineering. Research-level skills in this area will be taught. Two hours lecture and three hours lab a week. Pr.: ASI 500, BIOL 500, and one of BIOCH 521, 525, or 755. Enrollment limited to 18 students. PLPTH-911-1-0404

PLPTH 915. Advanced Techniques in Cytogenetics. (3) I, in odd years. An advanced course in research techniques in genome analysis, especially of higher plants emphasizing genetic mapping by use of various cytogenetic stocks. Laboratory and greenhouse experiments are performed. Pr.: AGRON 770 or BIOL 615 or equivalent. PLPTH-915-0-0404

PLPTH 920. Topics in Plant Pathology. (Var.) I, II, S. Discussions and lectures on important areas and contributions in the field of phytopathology. Pr.: Graduate standing. PLPTH-920-0-0404

PLPTH 927. Fungal Genetics. (3) II, in odd years. A study of the classical, molecular, and population aspects of fungal genetics in both model and commercially important systems. Topics to be discussed include: genetic analysis via mitosis and meiosis, models of recombination, genetic control of fungal development, basic molecular genetics of fungi, and genetic factors affecting fungal population structure and stability. Three hours lec./discussion a week. Pr.: BIOCH 521, ASI 500; recommended: BIOL 640 and a 600-level or higher course in genetics. PLPTH-927-0-0404

PLPTH 999. Research in Plant Pathology for the Ph.D. Degree. (Var.) I, II, S. Work is offered in general plant pathology, plant virology, plant nematology, disease physiology, and epidemiology. Pr.: Sufficient background to conduct the line of research undertaken. PLPTH-999-4-0404

Architecture and Design

Lane L. Marshall,* Dean
 William R. Jahnke,* Associate Dean
 Lynn Ewanow, Assistant Dean
 Paul G. Windley,* Assistant Dean

212 Seaton Hall
 532-5950

The College of Architecture and Design offers opportunities for professional study in architecture, interior architecture, landscape architecture, and regional and community planning.

The College of Architecture and Design consists of four academic departments: architecture, interior architecture, landscape architecture, and regional and community planning.

The curriculum in architecture is accredited by the National Architectural Accrediting Board (NAAB). The interior architecture curriculum is accredited by the Foundation for Interior Design Education and Research (FIDER). The landscape architecture curricula are accredited by the Landscape Architectural Accreditation Board (LAAB). The planning curriculum is accredited by the American Planning Association (APA) in cooperation with the Association of Collegiate Schools of Planning (ACSP).

Bachelor's degrees are offered in architecture, interior architecture, and landscape architecture. Graduate degrees are offered in architecture, landscape architecture, and regional and community planning.

General Requirements

Electives

Curricula in the college indicate two types of electives: those listed as free electives may be chosen from any course offered in the University that is open to the student; those electives listed with a specific designation must be chosen from those courses in the indicated field that are open to the student. Four hours of electives may be taken in basic military science. Additional information concerning acceptable electives is available at the dean's office or departmental offices.

Student projects

All programs within the College of Architecture and Design involve extensive project work. Students are advised to budget sufficient funds to cover the cost of materials and supplies. Material costs will be higher than those published for nonstudio curricula.

Student projects, assignments, presentations, and models may be retained by the various departments. Students are advised to assemble photographic files of their work for their portfolios.

Transfer students

In addition to credit for general studies courses, transfer credit for professional courses equivalent to those offered by the College of Architecture and Design will be accepted if earned in environmental design programs accredited by NAAB, FIDER, or LAAB. Students who have questions concerning the transfer of specific courses should contact the dean's office.

Graduate programs

The College of Architecture and Design offers graduate study leading to the master of architecture, master of landscape architecture, and master of regional and community planning degrees. Students and faculty from each of these degree programs work collaboratively in historic preservation, professional practice, and community/urban design. Additional information on the graduate programs is included in the Graduate School section of this catalog.

Options

Design Discovery Program

The Design Discovery Program is an intensive design experience for students who are curious about the environmental design fields of architecture, interior architecture, landscape architecture, or regional and community planning. The program is offered in early summer for high school, community college, and other students not currently enrolled in the College of Architecture and Design.

Participants are offered an opportunity to learn about the challenges and rewards of a career in environmental design through direct interaction with professional designers.

The program is structured to help individual students explore their interests and abilities through a series of design exercises. Students who find the challenge of environmental design satisfying are given assistance in planning future courses of study.

Students usually live on the University campus while participating in the program and benefit from the opportunity to experience college life and meet others who have similar interests.

Participants in the Design Discovery Program may, if they wish, receive University credit for completing the program.

Honors program

Honors courses are open to students who wish to be challenged beyond the requirements of regular classes. Students in these seminars study selected topics in environmental design.

Summer School

Some University courses may be taken during the summer session. Detailed information on specific courses is contained in the Summer School Bulletin, which may be obtained from the Division of Continuing Education, College Court Building, Manhattan, Kansas 66506-6002. It is available in early spring.

Concurrent degree programs

The nature of the environmental design professions makes concurrent study toward a degree in a variety of other fields an attractive and logical decision for some students. Early development of such academic plans will allow the student sufficient time to coordinate courses and to plan enrollments. Interested students should contact the dean's office.

Secondary majors

Certain departmental courses have been approved for credit toward the secondary major in gerontology, international studies, and women's studies. A listing of the approved courses may be found in the Secondary Majors section of this catalog.

Admission to the college

Enrollment in the College of Architecture and Design is limited. Students are admitted once a year into the fall-semester studio classes of Environmental Design Studies (ENVD).

High school applicants and college transfer students who seek admission to the College of Architecture and Design, must file both (a) an application for University admission and (b) a freshman or transfer student self-report form for review by the Admissions Office. These two forms must be mailed to the Office of Admissions no later than February 1. Student applicants for entrance into the studio classes in Environmental Design Studies will be notified on or about March 1. Students seeking early notification of admission, should send the above two documents to the University Office of Admissions by November 1. All applicants will be notified of their admissions status.

Admission application forms and self-report forms may be obtained by contacting the dean's office or the Office of Admissions.

Environmental Design Studies

All students are enrolled in environmental design studies for their freshman and sophomore years of study. In the first two years, student are introduced to the knowledge, concerns, attitudes, methods, and skills common to the environmental design professions of architecture, interior architecture, landscape architecture, and regional and community planning. After successful completion of these course requirements, students undertake the professional curricula in the degree-granting departments.

The professional part of the curricula in architecture, interior architecture, and landscape architecture extends from the third through the fifth year. Admission to the degree-granting programs is determined by faculty in each department. The admissions process is administered by the Departments of Architecture, Interior Architecture, and Landscape Architecture. In all departments, admission may be affected by availability of teaching faculty, space, and equipment.

Participation in environmental design studies courses, together with a close working relationship with faculty advisors, helps students make informed career choices within, and sometimes outside, fields of study represented in the College of Architecture and Design.

Eligible transfer students may apply for admission to the accelerated studios in environmental design studies, which usually enable them to complete the program requirements in one year.

Program of study

The curriculum for the first two years forms the foundation of the five-year accredited professional programs in architecture, interior architecture, and landscape architecture.

Environmental design studies

100 ENV D

First year

First semester

| | | |
|-----------|--------------------------------------|-----------|
| ENV D 205 | Graphics I | 2 |
| ENV D 230 | Drawing and Visual Perception | 2 |
| ENV D 220 | Theory of Environmental Design I | 2 |
| ENGL 100 | English Composition I | 3 |
| ART 195 | Survey of Art History I | 3 |
| | or | |
| HIST 101 | Western Civilization: Rise of Europe | 3 |
| MATH 201 | Elementary Applied Mathematics | 3 |
| | | 15 |

Second semester

| | | |
|-----------|-----------------------------------|---|
| ENV D 206 | Graphics II | 2 |
| ENV D 231 | Environmental Design Studio I | 2 |
| ENV D 222 | Theory of Environmental Design II | 2 |
| ENGL 120 | English Composition II | 3 |

| | | |
|----------|----------------------------------|-----------|
| ART 196 | Survey of Art History II | 3 |
| | or | |
| HIST 102 | Western Civilization: Modern Era | 3 |
| PHYS 115 | Descriptive Physics | 4 |
| SPCH 105 | Public Speaking IA | 2 |
| | | 18 |

Second year

Third semester

| | | |
|------------------|--|-----------|
| ENV D 232 | Environmental Design Studio II | 4 |
| ENV D 224 | Theory of Environmental Design III | 2 |
| ENV D 290 | Technology of Designed Environment | 3 |
| ENV D 291 | Technology of Designed Environment Lab | 1 |
| ENV D 250 | History of the Designed Environment I | 3 |
| PE 101 | Concepts in Physical Education | 1 |
| Limited elective | | 3 |
| | | 17 |

Fourth semester

| | | |
|------------------|--|-----------|
| ENV D 233 | Environmental Design Studio III | 4 |
| ENV D 226 | Theory of Environmental Design IV | 2 |
| ENV D 292 | Concept of Structure | 3 |
| ENV D 293 | Concept of Structure Lab | 1 |
| ENV D 251 | History of the Designed Environment II | 3 |
| Limited elective | | 3 |
| | | 16 |

Total for ENV D curriculum 66 minimum

High school mathematics prerequisites: Entering freshman or transfer students should have fulfilled the minimum prerequisites of: algebra I (one unit); plane geometry (one unit); algebra II (one unit); and trigonometry (one-half unit) before entering the College of Architecture and Design. The prerequisites may be fulfilled at KSU, or elsewhere, with the exception of geometry, which is not taught at KSU.

After satisfactory completion of the environmental design studies, students are eligible to apply for admission to the Department of Architecture, the Department of Interior Architecture, or the Department of Landscape Architecture.

Courses in environmental design studies

ENV D 205. Graphics I. (2) I, II, S. Instruction in instrument-aided drawing as a basic tool for communicating information about environmental subjects. Four hours of studio a week. Pr.: Permission of the College of Architecture and Design. ENV D-205-1-0201

ENV D 206. Graphics II. (2) I, II, S. Instruction in the principles and methods of perspective drawing. Perspective drawing is used as a basic tool for communicating information about design components and properties. Four hours of studio a week. Pr.: ENV D 205. ENV D-206-1-0201

ENV D 207, 208. Form, Space, and Order I, II. (3) I, II. A design course devoted to the study of the essential elements of form and space and the principles that control their organization in the designed environment. Three-dimensional design problems are used to develop an awareness of human behavior, perception, and response associated with the designed environment. A general course for nonmajors. Six hours studio a week.

ENV D 207. Form, Space, and Order I. (3) I. Pr.: ENV D 205, 206. ENV D-207-0-0201

ENV D 208. Form, Space, and Order II. (3) II. Pr.: ENV D 205, 206, 207. ENV D-208-0-0201

ENV D 212. Studio for Environmental Design and Graphics. (3) I, II, S. Introduction to graphic communication skills and problem-solving processes used by environmental designers. For students not enrolled in the College of Architecture and Design. Six hours studio a week. ENV D-212-1-0201

ENV D 220. Theory of Environmental Design I. (2) An introduction to the social, cultural, and behavioral factors in environmental design. Two hours lec. a week. ENV D-220-0-0201

ENV D 221. Theory of Environmental Design Honors I. (1) I. Same as ENV D 220, but includes additional seminar sessions requiring reading, writing, and discussion. For honors students. ENV D-221-0-0201

ENV D 222. Theory of Environmental Design II. (2) II. An introduction to the relationship of the natural environment to the life within it and as a factor in environmental design. Two hours lec. a week. Pr.: ENV D 220. ENV D-222-0-0201

ENV D 223. Theory of Environmental Design Honors II. (1) II. Same as ENV D 222, but includes additional seminar sessions requiring reading, writing, and discussion. For honors students. Pr.: ENV D 220. ENV D-223-0-0201

ENV D 224. Theory of Environmental Design III. (2) I. An introduction to elements of design; visual and aesthetic factors relating the designed environment to human needs. Two hours lec. a week. Pr.: ENV D 222. ENV D-224-0-0201

ENV D 225. Theory of Environmental Design Honors III. (1) I. Same as ENV D 224, but includes additional seminar sessions requiring reading, writing, and discussion. For honors students. Pr.: ENV D 222. ENV D-225-0-0201

ENV D 226. Theory of Environmental Design IV. (2) II. An introduction to the relationship of science and technology to the designed environment. Two hours lec. a week. Pr.: ENV D 224. ENV D-226-0-0201

ENV D 227. Theory of Environmental Design Honors IV. (1) II. Same as ENV D 226, but includes additional seminar sessions requiring reading, writing, and discussion. For honors students. Pr.: ENV D 224. ENV D-227-0-0201

ENV D 230. Drawing and Visual Perception. (2) I, II, S. Instruction in the visual perception, drawing, and verbal description of design components and properties of environmental subjects at different scales of observation. Four hours of studio a week. Pr.: Admission to the College of Architecture and Design. ENV D-230-1-0201

ENV D 231. Environmental Design Studio I. (2) I, II, S. Instruction in the relationships between design components and properties at different scales of observation. Introduction to design process. Continued instruction in design communication skills. Four hours of studio a week. Pr.: ENV D 230. ENV D-231-1-0201

ENV D 232, 233. Environmental Design Studio II, III. Studies in a wide range of environmental design problems using varied means of communications as they pertain to architecture, interior architecture, and landscape architecture. Eight hours of studio a week.

ENV D 232. Environmental Design Studio II. (4) I. Pr.: ENV D 231. ENV D-232-1-0201

ENV D 233. Environmental Design Studio III. (4) II. Pr.: ENV D 232. ENV D-233-1-0201

ENV D 240. Honors Seminar in Environmental Design Studio. (1) I, II. Discussion and additional reading concerning issues arising out of an environmental design studio. For honors students, repeatable for credit. To be taken conc. with an EDS studio. ENV D-240-0-0201

ENV D 250 and ENV D 251. History of the Designed Environment I and II. A study of the history of the built environment and its relationship to the societies that produced it; classic times to present. Three hours lec. a week.

ENV D 250. History of the Designed Environment I. (3) I. Pr.: HIST 102 or ART 196. ENV D-250-0-0201

ENV D 251. History of the Designed Environment II. (3) Pr.: ENV D 250. ENV D-251-0-0201

ENVD 290. Technology of the Designed Environment. (3) I. Criteria for evaluation and selection of materials; the art of joining; introduction to communicating construction information; interrelation of material properties, fabrication-erection, methods, and design considerations. Introduction to systems of environmental control. Taken conc. with ENVD 291. Pr.: MATH 201 and PHYS 115. ENVD-290-0-0201

ENVD 291. Technology of the Designed Environment Laboratory. (1) I. Laboratory/recitation to supplement and reinforce the material covered in lecture course. Taken conc. with ENVD 290. ENVD-291-0-0201

ENVD 292. The Concept of Structure. (3) II. A descriptive course in structures in the natural and built environment covering concepts and vocabulary. Topics include force, equilibrium, active and reactive forces, stability, and strength of materials. Emphasis is on design decisions. Three hours lec. a week. Taken conc. with ENVD 293. Pr.: MATH 201 and PHYS 115. ENVD-292-0-0201

ENVD 293. The Concept of Structure Laboratory. (1) II. Laboratory/recitation to supplement and reinforce the material covered in lecture course. Taken conc. with ENVD 292. ENVD-293-0-0201

ENVD 299. Problems in Basic Design. (Var.) I, II, S. A study of specified problems in elementary environmental design under the guidance of a member of the staff. Pr.: Approval of department head. ENVD-299-4-0201

ENVD 341, 342. Accelerated Environmental Design Studio I, II. Foundation in environmental design with emphasis on design fundamentals and graphic communication skills. Pr.: For transfer students with 8 or more credit hours in environmental design, graphics, and/or art studio courses, and admission to the College of Architecture and Design. Twelve hours of studio a week.

ENVD 341. Accelerated Environmental Design Studio I. (6) ENVD-341-1-0201

ENVD 342. Accelerated Environmental Design Studio II. (6) Pr.: ENVD 341. ENVD-342-1-0201

ENVD 351. Developments in the Built Environment: 1890-1945. (3) I. Examination of developments in design in Europe and the United States. Attention given to diversity of movements throughout the period. Emphasis given to attitudes toward design and to the socio-cultural context in which they occurred. Pr.: ENVD 251 or equiv. ENVD-351-0-0201

ENVD 352. Developments in the Built Environment Since 1945. (3) II. Examination of recent developments in the design of buildings and urban schemes in Europe and the United States. Course will focus on diversity of contemporary directions and influential design attitudes. Three hours lec. a week. Pr.: ENVD 251 or equiv. ENVD-352-0-0201

ENVD 370. Perspective Methodology for Designers. (2) Intersession. Mechanical and freehand perspective drawing methodology as a systematic approach to three-dimensional design. Projects will be directed toward the individual student's area of interest and need. Pr.: ENVD 208 and 2 hours drawing credit. ENVD-370-0-0201

ENVD 375. The Designed Environment and Human Behavior. (3) I. An introduction to those aspects of human behavior which influence the process of environmental design, including the ways in which people perceive, think about, respond to, and interact in physical settings. Techniques for environmental analysis and design from a behavioral perspective will be applied to architectural, urban, and natural settings. Three hours lecture/seminar a week. ENVD-375-0-0201

ENVD 380. Visual Thinking. (2) Intersession. An analysis of human recognition, visualization, and recording of environmental experiences. Experimental exercises in sensory stimulation and response recording. ENVD-380-0-0201

ENVD 505. Architectural Materials Testing. (2) I, II. Testing of materials commonly used in architecture, interior architecture, and landscape architecture, including steel, wood, concrete, aluminum, and plastics. Experimental evaluation of connections used with each material. Data analysis and report writing. One hour lec. and two hours lab a week. Pr.: ENVD 292 and junior standing. ENVD-505-3-0201

ENVD 510. Surroundings for People. (3) II, S. Functional and visual analysis of the designed environment; human response; relation to nature; introduction to design approaches; case studies; strategies for problem solving. Three hours illustrated lec.-discussion a week. Not for students in architecture, interior architecture, or landscape architecture. ENVD-510-0-0201

ENVD 520. Design Graphics Workshop. (1-4) I, II, S. Exposure to principles, techniques, and discipline of the communication modes of design drawing; exercises to illustrate the basic methodologies of perspective, orthographic, and oblique graphic systems for displaying three-dimensional messages of physical design issues and ideas. Pr.: Junior standing/open to nonmajors/architecture and design majors by permission of the department head only. ENVD-520-0-0201

ENVD 560. Accelerated Environmental Design and Graphics. (3) I, II, S. An accelerated study of design principles, elements, and methods facilitating the ability of students to translate ideas and concepts from their academic areas into two- and three-dimensional representation. Primarily for students from non-design baccalaureate programs entering graduate studies in architecture, landscape architecture, or regional and community planning. Nine hours studio a week. ENVD-560-0-0201

ENVD 650. Preservation Documentation. (3) I, II. Investigation of existing buildings and their settings; documenting design qualities, history, materials, systems, construction techniques, landscape, and physical and functional changes over time, using Historic American Building Survey Standards. Pr.: Senior standing and proficiency in drafting. ENVD-650-0-0201

ENVD 651. Preservation Principles and Methods. (3) I. Examination of theoretical and practical aspects of the preservation process of the built environment in the United States. Topics covered include: historical background, legislation, roles of preservation organizations, funding techniques, ramifications of historic districts and zoning, approaches to restoration and rehabilitation, scope of objectives. Three hours seminar a week. Pr.: Senior standing. ENVD-651-0-0201

ENVD 655. History of the Built Environment in the Midwest. (3) II. Examination of physical growth and development in the midwest-plains region, concentrating on second half of the nineteenth and early twentieth centuries. Investigation of both settlement patterns and basic building forms and types within a broad socio-cultural context. Seminar offered alternate years. Pr.: Senior standing. (For graduate and undergraduate credit.) ENVD-655-0-0201

ENVD 670. History of American Architecture and Allied Design I. (3) I. The history of American architecture including aspects of interior architecture, landscape architecture, urban planning, and preservation. This course investigates how the built forms of various colonial settlers in America responded to a new environment and, consequently, how a distinctive American culture eventually took shape by the end of the 1800s. Pr.: ENVD 250 and 251 or approval of the instructor. ENVD-670-0-0201

ENVD 671. History of American Architecture and Allied Design II. (3) II. The history of American architecture including some aspects of interior architecture, urban planning, landscape architecture, and preservation. This course will survey those distinctively American styles of design which originated in the late 1800s and will trace their impact on world architecture and how outside influences shaped

American design during that same time period up to the present. Particular emphasis will be placed upon the interplay of formal and functional concerns in architectural design. Pr.: ENVD 250 and 251 or approval of the instructor. ENVD-671-0-0201

ENVD 699. Problems in Environmental Design. (Var.) I, II, S. A study of specific environmental design problems under the direction of a member(s) of the departmental staff. Pr.: Junior standing. ENVD-699-4-0201

Architecture

William Miller,* Head

Professors Burnham,* Coates,* DeVilbiss, Ernst,* Foerster,* Hoag,* Jahnke,* Kremer,* Miller,* Stotesbury,* and Windley;* Associate Professors Charney,* Condia, Jones, McNamara, Norris-Baker,* Owens-Wilson,* Sachs,* Seamon,* Selfridge,* C. Watts,* D. Watts,* and Wendt; Assistant Professors Closet, Crawford, Feyerharm, Frey, Greenlee, Hall, Harper, Kren, Kristic, McMillan, Ornelas, Pecar, Siepl-Coates, Smith, Streeter, and Veregge; Emeriti: Professors Chang, Christensen, Fischer, Heintzelman, Krider, Sanner, and Slack; Adjunct Professor Garvin.

Undergraduate study

One of the few certainties the future holds is change. For this reason, the professional program in architecture emphasizes principles, analytical processes, and communication in addition to technical skills and knowledge. The program consists of four interrelated groups of professional courses in design, planning and programming, environmental analysis and technology, and professional practices, as well as an elective group. The design studio sequence is employed to apply much of the information introduced in other courses and to explore design issues and processes.

Optional study experiences are available through foreign exchange to Denmark, a summer program in Boston, or a 30-week internship program. The latter may involve a work experience in professional offices, industry, or governmental agencies affording students the opportunity to consolidate their academic experience in a professional context.

Graduate study

The Master of Architecture is a post-professional program requiring a minimum of 30 semester credit hours and a thesis for the completion of the degree. It permits specialization in environment-behavior and place studies, community design and preservation, or facilities programming. Emphases in the program accommodate graduates of five- or six-year programs in architecture, interior architecture, or landscape architecture, and certain four-year baccalaureate degrees. Applicants are

considered on the merits of their academic backgrounds and proposed programs of study.

Architecture program—115 AR

Total hours required for graduation—167

For the curriculum requirements for the first four semesters, see environmental design studies earlier in this section.

Fifth semester

| | | |
|------------|---|-----------|
| ARCH 401 | Architectural Design Studio I | 5 |
| ARCH 413 | Environmental Systems in Architecture I | 4 |
| ARCH 450 | Structural Systems in Architecture I | 3 |
| LAR 500 | Site Planning and Design | 3 |
| Electives* | | 3 |
| | | 18 |

Sixth semester

| | | |
|------------|---|-----------|
| ARCH 402 | Architectural Design Studio II | 5 |
| ARCH 514 | Environmental Systems in Architecture II | 3 |
| ARCH 451 | Structural Systems in Architecture II | 3 |
| ARCH 433 | Building Construction Systems in Architecture I | 3 |
| Electives* | | 3 |
| | | 17 |

Seventh semester

| | | |
|----------|--|-----------|
| ARCH 603 | Architectural Design Studio III | 5 |
| ARCH 515 | Environmental Systems in Architecture III | 3 |
| ARCH 434 | Building Construction Systems in Architecture II | 3 |
| PLAN 315 | Introduction to Planning | 3 |
| ARCH 650 | Architectural Programming | 3 |
| | | 17 |

Eighth semester

| | | |
|------------|--------------------------------|-----------|
| ARCH 604 | Architectural Design Studio IV | 5 |
| Electives* | | 10 |
| | | 15 |

or

| | | |
|----------|--------------------------|----|
| ARCH 504 | Architectural Internship | 15 |
|----------|--------------------------|----|

Ninth semester

| | | |
|------------|-----------------------------------|-----------|
| ARCH 680 | Development Analysis | 3 |
| ARCH 701 | Architectural Design Studio V | 5 |
| ARCH 705 | Project Programming | 1 |
| ARCH 720 | Environment and Behavior | 3 |
| ARCH 756 | Topics in Professional Practice I | 2 |
| Electives* | | 3 |
| | | 17 |

Tenth semester

| | | |
|------------|------------------------------------|-----------|
| ARCH 702 | Architectural Design Studio VI | 5 |
| ARCH 757 | Topics in Professional Practice II | 2 |
| Electives* | | 10 |
| | | 17 |

*Students must successfully complete at least 13 professional support elective credits and as many as 19 free elective credits.

Six hours of professional electives must be taken in history and/or theory courses.

Courses in architecture

Undergraduate credit

ARCH 301. Appreciation of Architecture. (3) I, II, S. An analysis of the evolution of architectural styles to determine the relation of architectural expression to the needs of society. Three hours rec. a week. May not be taken for credit by students enrolled in the architecture, landscape architecture, and interior architecture curricula. ARCH-301-0-0202

ARCH 401 and ARCH 402. Architectural Design Studio I and II. Relation of structures to their environment; client and community restraints; development of building programs; synthesis of functional, technical, and aesthetic considerations in the design of structures for human use. Twelve hours studio a week.

ARCH 401. Architectural Design Studio I. (5) I.

Pr.: Admission to the professional program and ENVD 233 or 342. ARCH-401-1-0202

ARCH 402. Architectural Design Studio II. (5) II, S.

Pr.: ARCH 401. ARCH-402-1-0202

ARCH 413. Environmental Systems in Architecture I. (4) I, II.

Discussion of the influences of environmental technology upon design concepts. Three hours lec. and one hour rec. a week. Pr.: Admission to a professional program in the college. ARCH-413-0-0202

ARCH 433 and ARCH 434. Building Construction Systems in Architecture I and II. (3 each) These courses deal with development of decision-making skills related to building construction systems in architecture, and with preparation of written and graphic communications which illustrate and direct the construction process. Methodologies for evaluating, selecting, manipulating, and interfacing building systems and materials are introduced with reference to changing technological, regulatory, and economic environments and their impact on building design. Materials properties, sequence of assembly, and studies of the construction process are reviewed. Two hours lec. and five and one-half hours of studio a week.

ARCH 433. Building Construction Systems in Architecture I. (3) II. Pr.: ENVD 290, ENVD 291, and admission to a professional program in the college. ARCH-433-1-0202

ARCH 434. Building Construction Systems in Architecture II. (3) I. Pr.: ARCH 433. ARCH-434-1-0202

ARCH 450. Structural Systems in Architecture I. (3) I. Broad approach to the design of building structures as whole systems. Basic issues and principles are identified by analysis of overall structural behavior in building forms. Simplified strategies and techniques are applied for analyzing and manipulating basic quantitative properties of major subsystems in response to anticipated loadings. Two hours lec. and three hours lab a week. Pr.: Admission to a professional program in the college and ENVD 290, ENVD 291. ARCH-450-1-0202

ARCH 451. Structural Systems in Architecture II. (3) II. Continuation of the study of major subsystems begun in ARCH 450, and introduction of techniques for the design of key sub-system components. Issues associated with analysis and design of special building structures are studied. Treatment of basic constructive and economic aspects of design and selection of structural systems. Two hours lec. and three hours lab a week. Pr.: ARCH 450. ARCH-451-1-0202

ARCH 475. Problems in Architectural Presentation. (Var.) I, II, S. Study of various methods of graphically representing architectural problems to develop professional office techniques. Pr.: Third-year standing and approval of instructor. ARCH-475-3-0202

ARCH 504. Architectural Internship. (15) I, II. Thirty weeks off-campus work—study in the office of an architect, environmental designer, or allied organization; field experience and office production. This course is not for graduate credit. Pr.: ARCH 434, ARCH 603, not more than one grade of "D" in an architectural design course, and approval of the internship coordinator. ARCH-504-2-0202

Undergraduate and graduate credit in minor field

ARCH 514 and ARCH 515. Environmental Systems in Architecture II and III. (3 each) Criteria for selection and application of natural and mechanical environmental control systems in architecture. Focus on the integration of thermal, illumination, sanitary, movement, and acoustical systems with the building fabric and the natural environment. Contemporary and developing approaches are explored. Three hours lec. a week.

ARCH 514. Environmental Systems in Architecture II. (3) II. Pr.: ARCH 413. ARCH-514-0-0202

ARCH 515. Environmental Systems in Architecture III. (3) I. Pr.: ARCH 413. ARCH-515-0-0202

ARCH 566. Problems in Architectural Design. (Var.)

S. Study of specific design problems under the direct supervision of a member of the architectural faculty. Pr.: Approval of instructor. ARCH-566-3-0202

ARCH 601. Topics in History of the Designed Environment. (3) I, II. For the concentrated study of a particular period or subject in the history of the built environment. Seminars, readings, discussions, and projects. May be taken by majors in the College of Architecture and Design for a total of 12 hours credit. Three hours rec. a week. Pr.: ENVD 251 or approval of instructor. ARCH-601-0-0202

ARCH 603. Architectural Design Studio III. (5) I, II. Problem analysis and program development, generation of alternate solutions, selection and refinement of the building design. Twelve hours studio a week. Pr.: ARCH 402 and not more than one grade of "D" in a prior architectural design course, and LAR 500 or concurrent enrollment in LAR 500. ARCH-603-1-0202

ARCH 604. Architectural Design Studio IV. (5) I, II. Continuation of ARCH 603. Increased complexity of function and space definition systems. Relating environmental technology to total design. Twelve hours studio a week. Pr.: ARCH 603 and not more than one grade of "D" in an architectural design course. ARCH-604-1-0202

ARCH 655. Foreign Seminar. (Var.) I, II, S. Group observation of design examples (ancient or modern) of a selected region, conducted in situ, to study significant aspects of environment, culture, and technology as relating to design solutions. ARCH-655-2-0202

Undergraduate and graduate credit

ARCH 621. Economics of Preservation. Detailed examination of economic issues in preservation of the built environment with emphasis on understanding costing techniques, public and private financing methods, and the economic benefits of preservation. Three hours a week. Pr.: ECON 110 and fourth-year standing. ARCH-621-0-0202

ARCH 650. Architectural Programming. (3) I, II. An introductory course surveying the basic philosophies and methodologies for architectural programming; emphasis on the comparative evaluation of different strategies and their integration within the process of design. Pr.: Senior standing or permission of the instructor. ARCH-650-3-0202

ARCH 660. Architectural Ornament. (3) I, II. Design and production of architectural ornamental elements; study of historic elements; study of historic and contemporary examples. One hour lec. and six hours studio a week. May be repeated once for credit. Pr.: Third-year standing in the College of Architecture and Design. ARCH-660-1-0202

ARCH 680. Development Analysis. (3) I, II. An examination of various development characteristics and components and their crucial interactive nature which leads toward success or failure of building and land developments. Development factors investigated include: market analysis, location uses and users, cost/benefits, nonmonetary benefits, financial returns expected and needed, financial incentives for investors, and feedback into the design process. Pr.: Admission to the professional program. ARCH-680-1-0202

ARCH 700. Architectural Design Programming. (2) I, II. Independent development of the program for ARCH 702, Architectural Design VI, under the direction of a faculty committee. Must be taken in residence and may be conc. with ARCH 604 or ARCH 701. Pr.: ARCH 603 and approval of the faculty committee. ARCH-700-3-0202

ARCH 701. Architectural Design Studio V. (5) I, II. Integration of the physiological, psychological, and sociological parameters in the design of people's environmental needs. Analysis, programming, and design of urban problems and/or large-scale site planning problems, increased complexity of function and space definition systems. Relating environmental technology to total design. Twelve hours studio a week.

Pr.: At least 2.0 GPA in required third-, fourth-, and fifth-year courses which have been taken; not more than one "D" in an architectural design course; at least a 1.75 GPA in required third-, fourth-, and fifth-year courses other than design which have been taken; either ARCH 604 or 504; ARCH 434, or ARCH 433 and conc. enrollment in ARCH 434; ARCH 515, or ARCH 514 and conc. enrollment in ARCH 515; and ARCH 450. ARCH-701-1-0202

ARCH 702. Architectural Design Studio VI. (5) I, II. Development of the student's project programmed in ARCH 702, under the direction of a faculty committee. Project must demonstrate a high level of achievement in systematic and comprehensive thinking, application of resources, and communication of the total process. Twelve hours studio a week. Pr.: At least 2.0 GPA in required third-, fourth-, and fifth-year courses which have been taken; not more than one "D" in an architectural design course; at least a 1.75 GPA in required third-, fourth-, and fifth-year courses other than design which have been taken; either ARCH 700; ARCH 701; ARCH 434; ARCH 515; ARCH 451, or ARCH 450 and conc. enrollment in ARCH 451. ARCH-702-1-0202

ARCH 703. Environmental Aesthetics. (3) I, II. Problems involving aesthetics in areas related to student's major field. Three hours a week. Pr.: Senior standing in architecture, landscape architecture, interior architecture, architectural structures, urban design. ARCH-703-0-0202

ARCH 704. Environmental Seminar. (Var.) I, II. Environmental systems related to human perception, reactions, and behavior. Pr.: Senior standing. ARCH-704-3-0202

ARCH 705. Project Programming. (1) I, II. Independent development of a program for ARCH 702, Architectural Design VI, under the direction of a faculty committee. Pr.: ARCH 603 and approval of the faculty committee. ARCH-705-3-0202

ARCH 710. Topics in Architectural Design Methods. (3) I, II. Intensive review of selected design methodologies, including systematic and computer-based approaches to problem definition and project design; emphasis upon the comparative evaluation of problem-solving strategies within the architectural design process. Pr.: Advanced undergraduate or graduate standing. ARCH-710-0-0202

ARCH 715. Theory of Design. (3) I, II. Analysis of theories and philosophies in the design professions, including those in related societal and technological fields. Pr.: ARCH 603 or IAR 603 or LAR 641. ARCH-715-0-0202

ARCH 716. Environmental Systems in Architecture. (3) I, II. Study of site-specific microenvironmental systems and the designed microenvironment about buildings. Exploration of their interaction and manipulation to meet human comfort requirements and achieve resource-efficient site and building design. Pr.: ARCH 413 and ARCH 402; or graduate standing. ARCH-716-0-0202

ARCH 720. Environment and Behavior. (3) I, II. An introductory course investigating the relationship between human behavior and the design of the physical environment, identifying those basic psychological and social concepts which influence and are influenced by the built environment. Three hours lec.-rec. a week. Pr.: Senior standing or permission of instructor. ARCH-720-0-0202

ARCH 725. Architectural Research Methods. (3) I, II. An introductory course surveying the basic philosophies and methodologies of science and research as they apply to the field of architecture. Special emphasis will be placed on those methods appropriate for investigating human response to the built environment. Three hours lecture/seminar a week. Pr.: Senior standing. ARCH-725-0-0202

ARCH 730. Environment and Aging. (3) I, II. An exploration of the aging process related to those factors in the architecturally designed environment that hinder and facilitate successful adaptation by the aging

individual. Three hours lecture/seminar a week. Pr.: Senior or graduate standing. ARCH-730-0-0202

ARCH 735. Topics in Building Construction Systems in Architecture. (1-4) I, II. Advanced study of the relationship of conceptual and/or technological factors of building construction to architecture. Pr.: ARCH 434; or graduate standing and consent of instructor. ARCH-735-1-0202

ARCH 752. Structural Systems in Architecture III. (Var.) I, II. Study of the relationship of conceptual and/or technological factors of structure to architectural design in more depth, or in a broader context of form-determining interactions than that presented in ARCH 450 and ARCH 451. Pr.: ARCH 450, ARCH 451. ARCH-752-varies-0202

ARCH 756 and ARCH 757. Topics in Professional Practice I and II. Studies of conventional and newly developing modes of professional architectural practice. The relationship of the architect and the profession to the user, client, building industry, and society. Two hours lec. a week.

ARCH 756. Topics I. (2) I, II. Pr.: Fourth-year standing. ARCH-756-0-0202

ARCH 757. Topics II. (2) I, II. Pr.: Fourth-year standing. ARCH-757-0-0202

ARCH 765. Problems in Architecture. (Var.) I, II, S. A study of specific architectural problems under the direction of a member of the department staff. Pr.: Approval of instructor. ARCH-765-3-0202

Graduate credit only

ARCH 746. Urban Design Studio I. (4) I. An interdisciplinary design studio involving large scale design; projects with extensive time implementation sequence, responses to socio-economic, cultural, environmental, and technical needs, and implementation strategies. Design methods are applied to selected urban areas of the Midwest. Pr.: PLAN 315 or equiv. and conc. enrollment in PLAN 749. ARCH-746-1-0202

ARCH 830. Advanced Architectural Design. (Var.) I, II, S. Studies related to a comprehensive program in architecture. Pr.: ARCH 702. ARCH-830-3-0202

ARCH 846. Urban Design Studio II. (4) II. Continuation of ARCH 746. Pr.: ARCH 746 and conc. enrollment in PLAN 845. ARCH-846-1-0202

ARCH 847. Urban Design Field Study. (3) I, II, S. A field investigation of varied large scale institutions, C.B.D., and other mixed use developments. Pr.: PLAN 745 and PLAN 746. ARCH-847-1-0202

ARCH 899. Research in Architecture. (Var.) I, II, S. Study in architecture and related fields leading to thesis or nonthesis project. Pr.: Approval of instructor. ARCH-899-4-0202

Interior Architecture

Stephen M. Murphy, Head

Professors Haycock, McDonald, and McGraw,* Associate Professors Husseini and Murphy; Assistant Professors Brown, Bullock, Dubois, Hastings, Thompson, and Troyer; Emeritus Professor Durgan.

Undergraduate study

The bachelor of interior architecture professional program consists of a three-year course of study following the two-year environmental design studies program.

The curriculum in interior architecture is structured for students who plan a professional career in space planning in commercial, institutional, and industrial interior

design. After an introduction to basic interior space planning, students undertake studio exercises that include programming and designing of spaces. Special emphasis is placed on spatial organization, behavior analysis, space component design and construction, the integration of environmental systems, building rehabilitation, and the preparation of working drawings and contract documents.

An elective 30-week internship program, which may include work-study experience in professional offices or industry, affords advanced students the opportunity to work in a professional context and to apply the problem-solving approaches they have developed.

Foreign study program

During their fourth year, interior architecture students may participate in the 30-week exchange program between KSU and a selected foreign institute, as an alternative to the internship program. Students may earn 15 hours of credit while overseas.

Interior architecture program—150 IAR

Total hours required for graduation—167

For the curriculum requirements for the first four semesters, see environmental design studies, earlier in this section.

Fifth semester

| | | |
|----------------|---|-----------|
| IAR 401 | Interior Architectural Design Studio I | 5 |
| ARCH 413 | Environmental Systems in Architecture I | 4 |
| IAR 409 | Finishing | 3 |
| IAR 415 | History of Interior Architecture | 2 |
| Free electives | | 3 |
| | | 17 |

Sixth semester

| | | |
|----------|---|-----------|
| IAR 402 | Interior Architectural Design Studio II | 5 |
| ARCH 514 | Environmental Systems in Architecture II | 3 |
| ARCH 433 | Building Construction Systems in Architecture I | 3 |
| IAR 420 | Theory of Furniture Design | 2 |
| IAR 407 | Design Workshop I | 3 |
| | | 16 |

Seventh semester

| | | |
|---------------|--|-----------|
| IAR 603 | Interior Architectural Design Studio III | 5 |
| ARCH 515 | Environmental Systems in Architecture III | 3 |
| IAR 408 | Design Workshop II | 3 |
| Free elective | | 3 |
| ARCH 434 | Building Construction Systems in Architecture II | 3 |
| | | 17 |

Eighth semester

| | | |
|----------------|--|-----------|
| IAR 604 | Interior Architectural Design Studio III | 5 |
| Free electives | | 10 |
| | | 15 |
| | or | |
| IAR 644 | Interior Architecture Internship | 13 |
| IAR 645 | Interior Architecture Internship Reports | 2 |
| | | 15 |

| | | |
|---------|---|----|
| or | | |
| IAR 646 | Interior Architecture Foreign Studies | 13 |
| IAR 647 | Interior Architecture Foreign Studies Reports | 2 |
| | | 15 |

Option A**Ninth semester—A**

| | | |
|---------------------------------|--|----|
| IAR 701 | Interior Architectural Design Studio V | 5 |
| IAR 601 | Interior Architecture Seminar | 3 |
| ARCH 720 | Environment and Behavior | 3 |
| IAR professional elective | | 4 |
| Marketing elective | | 3 |
| | | 18 |

Tenth semester—A

| | | |
|---------------------------|---|----|
| IAR 702 | Interior Architectural Design Studio VI | 5 |
| IAR 754 | Contract Design Practice | 2 |
| CT 260 | Textiles | 3 |
| Management elective | | 4 |
| Free elective | | 4 |
| | | 18 |

Option B**Ninth semester—B**

| | | |
|---------------------|--|----|
| IAR 703 | Product Design Studio/Workshop I | 5 |
| IAR 755 | Product Design Illustration | 2 |
| IAR 756 | Theory of Product Design | 2 |
| IAR 601 | Interior Architecture Seminar | 3 |
| Free elective | | 6 |
| | | 18 |

Tenth semester—B

| | | |
|----------------------|---|----|
| IAR 704 | Product Design Studio/Workshop II | 5 |
| IAR 754 | Contract Design Practice | 2 |
| CT 260 | Textiles | 3 |
| Free electives | | 8 |
| | | 18 |

Courses in interior architecture**Undergraduate credit**

IAR 406. Problems in Interior Architecture. (Var.) I, II. Study of specific interior architectural problems under direct supervision of a member of the department. Pr.: Approval of instructor. IAR-406-0-0203

IAR 409. Finishing. (3) II. Methods of finishing various materials in interiors. Six hours lab a week. Pr.: ENVD 233 or 342. IAR-409-0-0203

IAR 414. Furniture Design Workshop. (3) I, II, S. Design, construction, and finishing of contemporary furniture and accessories. Pr.: Open to all students in the professional programs in architecture and landscape architecture. IAR-414-I-0203

IAR 415. History of Interior Architecture. (2) I. History of the design of architectural interiors and their related components. Special emphasis upon the developments of the twentieth century. Pr.: Admission to professional program in architecture, interior architecture, or landscape architecture. Two hours lec. a week. IAR-415-0-0203

IAR 420. Theory of Furniture Design. (2) II. Design theory related to analysis, materials, and construction techniques of contemporary furniture. Pr.: Admission to professional program in architecture, interior architecture, or landscape architecture. Two hours lec. a week. IAR-420-0-0203

Undergraduate and graduate credit

IAR 401, 402, 603, 604, 701, and 702. Interior Architectural Design Studio I through VI. Analysis, synthesis, and design execution of various types of interior spaces, integrating such space design determinants as human factors, environmental-technological systems, activity structure, and symbiotic relationships. Not more than one grade of "D" in an interior architecture design studio course. **Interior Architectural Design Studios I and II are not for graduate credit.**

IAR 401. Interior Architectural Design Studio I. (5) I. Pr.: Admission to professional program and ENVD 233 or 342. IAR-401-I-0203

IAR 402. Interior Architectural Design Studio II. (5) II. Pr.: IAR 401. IAR-402-I-0203

IAR 603. Interior Architectural Design Studio III. (5) I. Pr.: IAR 402. IAR-603-I-0203

IAR 604. Interior Architectural Design Studio IV. (5) II. Pr.: IAR 603. IAR-604-I-0203

IAR 701. Interior Architectural Design Studio V. (5) I. Pr.: IAR 604. IAR-701-I-0203

IAR 702. Interior Architectural Design Studio VI. (5) II. Pr.: IAR 701. IAR-702-I-0203

IAR 407 and 408. Design Workshop I and II. Instruction in the sequence of courses consists of the design, development of shop drawings, construction, and finishing of interior space components. **Design Workshop I and II are not for graduate credit.**

IAR 407. Design Workshop I. (3) I. Pr.: Admission to a professional program and consent of instructor. IAR-407-I-0203

IAR 408. Design Workshop II. (3) II. Pr.: IAR 407. IAR-408-I-0203

IAR 410. Interior Architecture Microcomputer Applications. (2) I, II. Instruction in microcomputer operating procedure, general terminology, programming concepts for microcomputer, and use of appropriate word-processing specification writing and computer-aided design software as it relates to the interior architecture profession. Four hours lab a week. Pr.: Enrollment in the interior architecture program. IAR-410-I-0203

IAR 601. Interior Architecture Seminar. (3) I. Readings and discussion of contemporary thought and movements within the field of interior architecture with special emphasis on the societal factors which produce and affect change. Pr.: IAR 402 or graduate standing. IAR-601-0-0203

IAR 644. Interior Architecture Internship. (13) II, S. Thirty weeks off-campus work study in professional offices specializing in interior architecture: field and office experience. Pr.: IAR 603, ARCH 433, not more than one grade of "D" in an interior architecture design studio, and approval by the internship coordinator. IAR-644-2-0203

IAR 645. Interior Architecture Internship Report. (2) II, S. Taken in conjunction with IAR 644. The purpose is to develop the student's communication skills and awareness of the importance of written communication and record keeping in interior architectural office practice. The required report will provide a detailed documentation of the student's experiences encountered during internship. Pr.: Conc. enrollment in IAR 644. IAR-645-2-0203

IAR 646. Interior Architecture Foreign Studies. (13) II, S. This course allows the student to study outside of the United States for one semester. The semester will expand their global perspective of design professions, cultural, political, and economic views. One semester studying interior architecture in a foreign university. Pr.: IAR 603, ARCH 433, not more than one grade of "D" in an interior architecture design studio and approval by the foreign studies coordinator. IAR-646-2-0203

IAR 647. Interior Architecture Foreign Studies Reports. (2) II, S. Taken in conjunction with IAR 646. The purpose is to develop the student's written communication skills as well as increase awareness of written communication and record keeping in interior architecture office practice. The report will provide detailed documentation of the student's experiences during the Foreign Studies Program. Pr.: Conc. enrollment in IAR 646. IAR-647-2-0203

IAR 703. Product Design Studio/Workshop I. (5) I. Analysis, synthesis, and design of various types of products associated with the interior environment, integrating such human factor determinants as

anthropometrics and ergonomics. Construction of prototype products associated with the human environment developed concurrently within the design studio. Fifteen hours studio/workshop a week. Pr.: IAR 604 or IAR 644 or IAR 646 and not more than one "D" in an interior architecture design studio course. IAR-703-0-0203

IAR 704. Product Design Studio/Workshop II. (5) II. Advanced design projects involving products related to the interior environment. Synthesis of the design, materials, construction, and finishing of prototype products relevant to human use. Fifteen hours studio/workshop a week. Pr.: IAR 703; not more than one "D" in an interior architecture design studio course. IAR-704-0-0203

IAR 720. Advanced Seminar in Interior Architecture. (1-3) I, II. Advanced readings and discussions of environmental issues related to the practice of interior architecture. Readings, discussions, reports. Pr.: IAR 702 or equiv. IAR-720-0-0203

IAR 740. Advanced Design Workshop. (1-4) I, II. Advanced instruction in the design, construction, and finishing of contemporary furniture and accessories. Pr.: IAR 414 or equiv. IAR-740-I-0203

IAR 754. Contract Design Practice. (2) II. Evaluation, selection, and specification of interior architectural materials, surfaces, and finishes. Pr.: IAR 604. IAR-754-0-0203

IAR 755. Product Design Illustration. (2) I. Exercises in various rendering techniques and involvement in different media presentations associated with product design. Pr.: IAR 604. IAR-755-I-0203

IAR 756. Theory of Product Design. (2) II. History and design theory related to analysis materials and construction in product design. Pr.: IAR 420. IAR-756-1-0203

Graduate credit

IAR 821. Advanced Interior Architectural Design. (1-4) I, II. Advanced study of interior space planning and interior component design. Pr.: Professional design degree. IAR-821-0-0203

IAR 830. Problems in Interior Architecture. (Var.) I, II. Study of specific interior architectural problems under direct supervision of the departmental staff. Pr.: Professional design degree. IAR-830-0-0203

Landscape Architecture

Dennis L. Law,* Head

Professors Barnes,* Brooks,* Day,* Forsyth,* Law,* Marshall,* and Page;* Associate Professors Chelz, Clement, Ewanow, Haldeman, and Winslow; Assistant Professors Hansen, Johnson, Jutla, Keane, Rassman, Rolley, Sullivan, Tauges,* and Wigfall; Instructor Bascom; Emeriti: Professors Ealy and Quinlan.

Undergraduate study

The bachelor of landscape architecture professional program consists of a three-year course of study following the two-year environmental design studies program.

The curriculum is designed to prepare students for professional landscape architecture. Special emphasis is placed upon outdoor space organization, land planning, topographical manipulation, landscape planning and construction, and

the role of adapted plant materials in the landscape. The study of the human impact upon the environment, both natural and built, is emphasized. The bachelor of landscape architecture degree is accredited by the Landscape Architectural Accreditation Board of the American Society of Landscape Architects.

All required courses taught in the Department of Landscape Architecture that are counted toward the degree must be passed with a grade of C or better.

Graduate study

Individual graduate programs in the master of landscape architecture curriculum can accommodate students with bachelor's degrees in many fields of study. Applicants are considered on the merits of their academic backgrounds and proposed programs of study. The master of landscape architecture degree is accredited by the Landscape Architectural Accreditation Board of the American Society of Landscape Architects.

Landscape architecture program—180 LAR

Total hours required for graduation—167

For the curriculum requirements for the first four semesters, see environmental design studies earlier in this section.

Fifth semester

| | | |
|--------------|---|-----------|
| LAR 431 | Landscape Architectural Design Studio I | 4 |
| LAR 436 | Landscape Construction I | 3 |
| CE 212 | Elementary Surveying Engineering* | 3 |
| HORT 374 | Woody Plant Materials I** | 3 |
| Art elective | | 2 |
| | | <u>15</u> |

Sixth semester

| | | |
|----------|--|-----------|
| LAR 432 | Landscape Architectural Design Studio II | 4 |
| LAR 437 | Landscape Construction II | 3 |
| LAR 510 | Landscape Architectural Delineation Techniques | 2 |
| HORT 375 | Woody Plant Materials II | 3 |
| LAR 460 | Microcomputer Applications in Landscape Architecture | 3 |
| | | <u>15</u> |

Seventh semester

| | | |
|---------|--|-----------|
| LAR 641 | Landscape Architectural Design Studio III | 4 |
| LAR 647 | Landscape Construction III | 3 |
| LAR 541 | Planting Design I | 4 |
| LAR 315 | Introduction to Planning | 3 |
| LAR 433 | History and Theory of Landscape Architecture | 3 |
| | | <u>17</u> |

Eighth semester

| | | |
|----------|--|-----------|
| LAR 642 | Landscape Architectural Design Studio IV | 4 |
| LAR 542 | Planting Design II | 4 |
| GEOG 705 | Remote Sensing of Environment | 3 |
| HORT 508 | Landscape Maintenance | 3 |
| LAR 501 | Landscape Architecture Seminar | 2 |
| LAR 744 | Community Site Planning | 3 |
| | | <u>19</u> |

Ninth semester

| | | |
|-------------------|---|-----------|
| LAR 701 | Landscape Architectural Design Studio V | 5 |
| LAR 756 | Designing Parks and Recreation Areas | 3 |
| LAR 501 | Landscape Architecture Seminar | 2 |
| LAR 645 | Professional Internship*** | 2 |
| Business elective | | 3 |
| General elective | | 3 |
| | | <u>18</u> |

Tenth semester

| | | |
|-------------------|--|-----------|
| LAR 702 | Landscape Architectural Design Studio VI | 5 |
| LAR 753 | Professional Practice | 2 |
| Business elective | | 3 |
| Science elective | | 4 |
| General elective | | 3 |
| | | <u>17</u> |

*Surveying is taught in civil engineering; MATH 150, Plane Trigonometry, or equivalent, is a prerequisite.

**Woody Plant Materials is taught in horticulture and the prerequisite is one of these three courses: horticulture/agronomy or HORT 200, Plant Science; BIOL 210, General Botany; or BIOL 198, Principles of Biology.

***Internship in a professional office is arranged by the student for the summer and credited in the next fall semester.

Courses in landscape architecture

Undergraduate credit

LAR 431 and LAR 432. Landscape Architectural Design Studio I and II. Design of the outdoor environment for human needs and activities; ecological considerations; project program, site selection, analysis, concept, design, communications, specification, construction, planting, and maintenance.

LAR 431. Landscape Architectural Design Studio I. (4) I. Two hours lec. and six hours design studio a week. Pr.: Admission to the professional program and ENVD 222, 233. LAR-431-1-0204

LAR 432. Landscape Architectural Design Studio II. (4) II. Two hours lec. and six hours design studio a week. Pr.: LAR 431. LAR-432-1-0204

LAR 433. History and Theory of Landscape Architecture. (3) I. The influences of social, political, economic, and climatic factors on historic landscape styles; theory of landscape design. Three hours rec. a week. Pr.: First-year classification in professional LAR program. LAR-433-0-0204

LAR 436. Landscape Construction I. (3) I. Problems in the basic aspects of land construction to include topography, site grading, earthwork estimating, and vehicular requirements. Two hours lec. and six hours studio a week. Pr.: ENVD 222, 290, 292. Conc. with CE 212. LAR-436-1-0204

LAR 437. Landscape Construction II. (3) II. Continuation of LAR 436. To include site layout, road alignment, construction detailing, and cost estimating. Two hours lec. and six hours studio a week. Pr.: LAR 436. LAR-437-1-0204

LAR 440. Problems in Landscape Design. (Var.) I, II, S. Assigned problems and reports in landscape architecture. Pr.: Junior standing. LAR-440-3-0204

LAR 450. General Landscape Design. (3) I, II. Basic graphic communication skills, design principles, and design vocabulary covering residential and small scale landscape development plans. Two hours lec. and two hours studio a week. A general service course for non-architecture and design majors. LAR-450-1-0204

LAR 460. Microcomputer Applications in Landscape Architecture I. (3) I, II. Introduction of uses of microcomputers in typical landscape architectural practice; function, operation characteristics, and applications of computer software and hardware. Two hours lec. and two hours lab a week. Pr.: Sophomore standing. LAR-460-1-0204

LAR 500. Site Planning and Design. (3) I, II. Theory, principles, and elements of site planning and design. Lectures, readings, short problems, and site visits dealing with site analysis, ecological consideration, grading, drainage, circulation and parking, lighting, planting design, materials and details, management and maintenance, and cost factors. Pr.: ARCH 401 or concurrent with ARCH 401. LAR-500-3-0204

Undergraduate and graduate credit in minor field

LAR 501. Landscape Architecture Seminar. (2) I, II. Required of all fourth- and fifth-year landscape architecture majors. Discussion of current trends in landscape architecture and related fields by students, faculty, and invited speakers. (Two 2-credit-hour seminars are required for a total of four hours.) LAR-501-2-0204

LAR 510. Landscape Architectural Delineation Techniques. (2) I, II. A study of delineation media and techniques that are related to the practice of landscape architecture in professional offices. Four hours studio a week. Pr.: ENVD 232 or 341. LAR-510-1-0204

LAR 541. Planting Design I. (4) I, II. Relationship between plants and the built environment; preparation of planting plans and their use as working drawings; elements and principles of planting design; specification writing; contractor relationships and design implementation. Two hours lec. a week and six hour of studio a week. Pr.: HORT 375; and BIOL 210 or HORT 200. LAR-541-1-5-0204

LAR 542. Planting Design II. (4) I, II. Specialized planting applications with emphasis on ecological issues in design; comprehensive in scale and complexity. Two hours lec. a week and six hours studio a week. Pr.: LAR 541. LAR-542-1-5-0204

LAR 641 and LAR 642. Landscape Architectural Design Studio III and IV. Design of the outdoor environment for human needs and activities; ecological considerations; project program, site selection, analysis, concept, design, communication, specification, construction, planting, and maintenance.

LAR 641. Landscape Architectural Design Studio III. (4) I. Twelve hours design studio a week. Pr.: LAR 432 and LAR 436. LAR-641-1-0204

LAR 642. Landscape Architectural Design Studio IV. (4) II. Twelve hours design studio a week. Pr.: LAR 641 and LAR 437. LAR-642-1-0204

LAR 645. Professional Internship. (2) I, II, S. Confirmed employment in a professional physical planning office, subject to the approval of the departmental faculty, for a period of eight weeks, documented by the employer and a written report by the student. Pr.: LAR 432, LAR 437. LAR-645-2-0204

LAR 647. Landscape Construction III. (3) I. Continuation of LAR 437 to include utilities routing, area lighting, irrigation systems, and construction specification writing. Two hours lec. and six hours studio a week. Pr.: LAR 437. LAR-647-1-0204

LAR 652. The Small Community in the Plains States. (3) I, II, S. An overview of the diverse nature of small communities in the Plains states, with an emphasis on the forms and patterns in the existing physical environment. Instruction in various methods of survey and analysis at the regional and community-specific scales, and application of these techniques to a different community each semester. Pr.: Fourth-year standing. LAR-652-1-0204

LAR 660. Landscape Rehabilitation of Disturbed Lands. (3) I. Planning rehabilitation of lands disturbed by mining and construction. Review of mining procedures, ecological systems, slope rehabilitation, and revegetation techniques. Three hours lec. a week. Pr.: Junior standing. LAR-660-0-10-0204

Advanced undergraduate and graduate credit

LAR 701 and LAR 702. Landscape Architectural Design Studio V and VI. Design of the outdoor environment for human needs and activities; ecological considerations; project program, site selection, analysis, concept, design, communication, specification, construction, planting, and maintenance.

LAR 701. Landscape Architectural Design Studio V. (5) I. Fifteen hours design studio a week. Pr.: LAR 642 and LAR 647. LAR-701-1-0204

LAR 702. Landscape Architectural Design Studio VI. (5) II. Terminal project. Individual studies approved by departmental faculty. Fifteen hours design studio a week. Pr.: LAR 701 and LAR 647. LAR-702-1-0204

LAR 710. Microcomputer Applications in Landscape Architecture II. (3) I, II. Examination of the application of microcomputer technology in the decision-making processes in the advanced practice and research of landscape architecture. Two hours lec. and two hours lab a week. Pr.: LAR 460. LAR-710-1-0204

LAR 731. Landscape Plant Field Studies I. (1) I. The study of introduced and indigenous deciduous woody trees, shrubs, vines, and herbaceous plants adapted to the northeastern Kansas region with emphasis on the identification and selection of plant materials for use in landscape design. One hour lec. and two hours outdoor lab a week. Pr.: Graduate standing. LAR-731-2-0204

LAR 732. Landscape Plant Field Studies II. (1) II. A continuation of LAR 731: including the study of introduced and indigenous woody conifers and broadleaf evergreens, deciduous flowering trees and shrubs, and native grasses and forbs adapted to the northeastern Kansas region with emphasis on the identification and selection of plant material for use in landscape design. One hour lec. and two hours outdoor lab a week. Pr.: LAR 731. LAR-732-2-0204

LAR 741. Problems In Landscape Architecture. (Var.) I, II, S. Specific problems and/or reports in the area of landscape architecture. Pr.: Advanced undergraduate or graduate standing. LAR-741-3-0204

LAR 744. Community Site Planning. (3) II. Growth and development of cities and towns; land subdivision. Eight hours lab a week. Pr.: PLAN 315 or consent of instructor. LAR-744-1-0204

LAR 746. Urban Design Studio I. (4) I. An interdisciplinary design studio involving large-scale design; projects with extensive time implementation sequence; responses to socioeconomic, cultural, environmental, and technical needs; and implementation strategies. Design methods are applied to selected urban areas of the Midwest. Pr.: PLAN 315 or equiv.; and conc. enrollment in PLAN 745. LAR-746-1-0204

LAR 747. Urban Design Studio II. (4) II. Continuation of LAR 746. Pr.: LAR 746 and conc. enrollment in PLAN 845. LAR-747-1-0204

LAR 748. Composite Planting Design I. (1-4) I. Plant characteristics and their application in landscape architectural design; ecological considerations of site adaptation; natural systems; comprehensive site analysis; variety in scale and scope of projects. Two hours lec. and seven hours studio a week. Pr.: Graduate standing. LAR-748-1-0204

LAR 749. Composite Planting Design II. (1-4) I, II. Preparation of planting plans and supplementary materials designed to fit a variety of sites; emphasis on planting design elements and principles. Two hours lec. and seven hours studio a week. Pr.: LAR 748. LAR-749-1-0204

LAR 750. Graduate Seminar in Landscape Architecture I. (2) I. Discussion of the scope of the profession and the nature of graduate study in landscape architecture. Pr.: Graduate standing in the department. LAR-750-0-0204

LAR 751. Graduate Seminar in Landscape Architecture II. (2) II. Readings and discussion of current issues in practice and research in landscape architecture. Pr.: LAR 750. LAR-751-0-0204

LAR 753. Professional Practice. (2) II. Ethics, office practice and procedure, contracts, and specifications. A professional resume is required. Two hours rec. a week. Fifth-year classification. LAR-753-0-0204

LAR 756. Design of Parks and Recreation Areas. (3) I. Site planning of national, state, municipal, and private parks, and specialized recreation areas. Three hours lec. a week. Pr.: Junior standing. LAR-756-0-0204

LAR 757. Design for Special Populations. (3) II. Design of exterior environments to accommodate the handicapped and disadvantaged individual. Pr.: Advanced undergraduate or graduate standing. LAR-757-0-0204

LAR 758. Land Resource Information Systems. (3) I. The understanding, collection, and application of land resource data to land planning and design. Current methods of resource inventory, ecologically oriented site analysis, and environmental impact assessment. Review of common sources for necessary information in each resource category. Two hours lec. and two hours studio a week. Pr.: Advanced undergraduate or graduate standing. LAR-758-1-0204

LAR 759. Landscape Resource Evaluation. (3) II. The determination of the impact of physical landscape project design upon the natural and man-made environment. Studies of existing site conditions and projections of the effect of such projects upon the site and vicinity. Pr.: Senior or graduate standing. LAR-759-0-0204

LAR 760. Composite Landscape Architecture Design Studio I. (1-4) I. Landscape design including delineation, design process, design elements, small-scale design, urban design. Pr.: Graduate standing. LAR-760-1-0204

LAR 761. Composite Landscape Architecture Design Studio II. (1-4) Continuation of LAR 760: including topics such as community design, resource analysis, park and recreation design, historic preservation with consideration of aesthetic and sensory issues. Pr.: LAR 760. LAR-761-1-0204

LAR 762. Composite Landscape Architecture Design Studio III. (1-4) I. Continuation of LAR 761: including topics such as community design, resource analysis, park and recreation design, historic preservation with consideration of aesthetic, technical, and economic issues. Pr.: LAR 761. LAR-762-1-0204

LAR 763. Composite Landscape Architecture Construction I. (1-5) II. Landscape construction including topography, site planning, site layout, grading, earthwork estimating, lighting, irrigation, construction detailing, cost estimating. Pr.: LAR 762. LAR-763-1-0204

LAR 764. Composite Landscape Architecture Construction II. (1-5) I. A continuation of LAR 763: large area grading, road alignment, storm drainage, utilities layout and specifications, contracts. Pr.: LAR 763. LAR-764-1-0204

Graduate credit only

LAR 860. Advanced Planting Design. (1-4) I, II, S. Special studies in advanced planting design. Pr.: LAR 549. LAR-860-4-0204

LAR 870. Advanced Landscape Architecture. (1-4) I, II, S. Special studies and designs in advanced landscape architecture. Pr.: LAR 702. LAR-870-4-0204

LAR 880. Advanced Landscape Construction. (1-4) I, II, S. Specialized study of large-scale landscape planning involving landscape construction and grading. Pr.: LAR 647. LAR-880-4-0204

LAR 898. Thesis Proposal Writing. (2) I, II. Exploration of procedures of planning, design, scheduling, organization, and management of a landscape architecture research project. Two hours lec. a week. Pr.: ARCH 725 or EDAF 816. LAR-898-1-0204

LAR 899. Research in Landscape Architecture. (Var.) I, II, S. Investigations in landscape architecture and related areas, of such caliber as to form the basis for a graduate thesis. Pr.: Graduate standing in landscape architecture. LAR-899-4-0204

Regional and Community Planning

C. A. Keithley,* Head

Professors Deines,* Keller,* and Weisenburger;* Associate Professors Daniels* and Keithley,* Assistant Professors Burns and Welker; Adjunct Professors Barnes, Ernst,* Foerster,* Jutla, McGraw,* Rolley, Seamon,* and Wigfall.

Graduate study

Study leading to the two-year professional graduate degree, master of Regional and Community Planning, requires a minimum of 48 graduate credit hours, plus an internship in planning of at least 2-3 credit hours. The degree is offered by the department in cooperation with the Departments of Architecture, Civil Engineering, Economics, Geography, Landscape Architecture, Political Science, and Sociology, and the Colleges of Agriculture, Business Administration, Education, and Human Ecology.

The program is fully accredited by the American Institute of Certified Planners and the Association of Collegiate Schools of Planning. The program is internationally recognized for its approach to rural and small town planning, which includes an understanding of the physical environment and the interplay of socioeconomic and political forces and processes.

Applicants with undergraduate degrees in administration, agriculture, architecture, business, construction science, economics, ecology, education, engineering, geology, geography, government, human ecology, landscape architecture, pre-law, planning, political science, and sociology, who meet the requirements of the Graduate School for admission are fully acceptable for graduate study in planning. Applicants with other academic backgrounds may be accepted upon approval of the department and subject to conditions it may impose.

Individual programs of study leading to the professional master of regional and community planning degree are comprised of 27 credit hours of core courses and 21 hours of specialization course work, plus an internship in planning of 2-3 semester credit hours when available. The core coursework consists of:

| | | |
|----------|-------------------------------------|---|
| PLAN 630 | Computer Applications | 2 |
| PLAN 700 | Planning Analysis | 3 |
| PLAN 715 | Planning Principles | 3 |
| PLAN 725 | Planning Theory | 3 |
| PLAN 735 | Community Plan Preparation | 3 |
| PLAN 736 | Community Plan Implementation | 4 |
| PLAN 770 | Planning Law | 3 |
| PLAN 800 | Research Methods in Planning | 3 |
| PLAN 820 | Planning Administration | 3 |

During the last semester of core course work, students take a comprehensive examination which provides the opportunity to demonstrate their skills and knowledge developed while pursuing the degree.

The 21 hours of specialized course work may be in any one of four regular specializations or, in the case of uniquely qualified students, a larger range of independent specializations. The minimum requirements of the departmentally supported specializations are:

Rural and small town planning

| | | |
|----------|---|---|
| PLAN 721 | Infrastructure Planning and Finance | 3 |
| PLAN 740 | Small Community and Rural Area Planning | 3 |
| PLAN 755 | State and Regional Planning | 3 |
| | Approved graduate course in rural sociology | 3 |
| | Approved graduate course in economics | 3 |
| | Approved graduate course in physical/biological systems | 3 |
| | Approved graduate electives (minimum) | 2 |

Resource planning

| | | |
|----------|--|---|
| PLAN 755 | State and Regional Planning | 3 |
| LAR 758 | Land Resource Information Systems | 3 |
| LAR 759 | Landscape Resource Evaluation | 3 |
| BIOL 529 | Ecology | 3 |
| | or | |
| BIOL 715 | Ecological Impact Assessment | 3 |
| | or | |
| GEOG 760 | Human Impact on the Environment | 3 |
| | Approved graduate course in resource economics | 3 |
| | Approved graduate electives (minimum) | 6 |

Community design and preservation

Community design option

| | | |
|----------|---|---|
| PLAN 710 | Urban Visual Analysis | 3 |
| PLAN 745 | Urban Design | 3 |
| PLAN 746 | Urban Design Studio | 4 |
| ENVD 651 | Preservation Principles and Methods | 3 |
| ARCH 680 | Development Analysis | 3 |
| | Approved graduate electives (minimum) | 5 |

Preservation option

| | | |
|----------|---|---|
| ENVD 650 | Preservation Documentation | 3 |
| ENVD 651 | Preservation Principles and Methods | 3 |
| ARCH 621 | Economics of Preservation | 3 |
| | or | |
| ARCH 680 | Development Analysis | 3 |
| PLAN 710 | Urban Visual Analysis | 3 |
| | or | |
| PLAN 745 | Urban Design | 3 |
| PLAN 746 | Urban Design Studio | 4 |
| | Approved graduate electives (minimum) | 5 |

Community Planning and Development

Community planning option

| | | |
|----------|---|---|
| PLAN 750 | Housing Policies and Programs | 3 |
| PLAN 755 | State and Regional Planning | 3 |
| PLAN 721 | Infrastructure Planning and Finance | 3 |
| | Approved graduate course in sociology | 3 |
| | Approved graduate course in economics | 3 |
| | Approved graduate course in political science | 3 |
| | Approved graduate electives (minimum) | 3 |

Community development option:

| | | |
|-----------|---|------|
| PLAN 750 | Housing Policies and Programs | 3 |
| PLAN 760 | Community Development Planning | 3 |
| PLAN 761 | Community Development Workshop | Var. |
| SOCIO 532 | Community Organization and Leadership | 3 |

| | |
|---|---|
| Approved graduate course in economics or finance .. | 3 |
| Approved graduate course in political science | 3 |
| Approved graduate electives (minimum) | 3 |

Students with programs of study in any of these regular specializations have the option of preparing a thesis or master's report in place of unspecified electives, provided that prior faculty approval is given. Satisfactory presentation and defense of either thesis or master's report will satisfy the requirement of the specialization component of the comprehensive exam.

Consistent with the interdisciplinary objectives of the faculty, uniquely qualified students are free to create independent specializations or variations on the departmentally sponsored specializations listed above. The faculty is careful to limit this option to students who have demonstrated a prior professional, career, or academic interest and capacity in the independent specialization they wish to pursue. Independent specializations require formal coordination with one or more programs or colleges outside of the department. These options may include, but are not limited to:

- Agricultural land planning** (College of Agriculture)
- Economic development planning** (Economics)
- Educational planning** (College of Education)
- Environmental planning** (Biology and/or College of Agriculture)
- Forest and range management planning** (Forestry and Agronomy)
- Infrastructure planning** (Civil Engineering)
- Health planning** (Human Ecology)
- Housing planning** (Architecture, College of Business, and/or College of Human Ecology)
- Planning and the aged** (Secondary major in gerontology, graduate emphasis in gerontology)
- Policy planning** (Political Science and/or College of Business Administration)
- Recreation planning** (Landscape Architecture, Forestry, and/or Physical Education and Leisure Studies)
- Site development planning** (Landscape Architecture and/or Architecture)
- Sustainable communities planning** (Architecture)
- Third world rural and regional development planning** (Sociology, Economics, Political Science, and/or Geography)
- Transportation planning** (Civil Engineering)
- Water resources planning** (Biology, Geography, and/or Forestry)

Students whose programs of study include an independent specialization may be advised to enroll for up to 3 hours of PLAN 880, Topics in Planning, in order to synthesize the relationship between the specialization and planning in a semester paper.

Some courses in the core and specialization curricula may be waived by the faculty based upon case by case review of a student's upper-division undergraduate work, prior graduate work, and professional practice. Waiver is not a routine occurrence, however, and it does not reduce the total amount of course work required for the MRCP degree unless advance standing is also granted. Advance standing will not normally exceed 10 semester credit hours and must be approved by the faculty and the Graduate School. Requests for consideration of award of advanced standing must be fully documented in a request by the student and must accompany the student's application for admission to the program.

Comprehensive Examination

Candidates for the master of regional and community planning degree are required to take a comprehensive examination during the semester of graduation. The exam serves a synthesizing role, offering the opportunity to integrate the core course work into areas of practical application. The exam is administered in four components briefly described as:

Component I

A multiple-choice exam similar in format to the AICP exam which practitioners take to become "certified" planners, covering general planning knowledge areas of the core curriculum.

Component II

An essay/short answer exam which asks candidates to respond to situational exercises similar to that on which a planning practitioner may be asked to provide recommendations.

Component III

Methods/analysis, in which the candidate will be provided a complete data set and a set of expectations for an analysis, projection, and summary socio-economic profile of the community. This component is open-book and will require the candidate to have a working knowledge of various microcomputer programs (Wordperfect, Lotus, Harvard Graphics, and others) as well as the basic programs and templates developed in the core planning courses.

Component IV

Specialization component, which allows the candidate to explore his or her stated specialization with a reasonable research effort, culminating in a short research report. This component may be waived should the candidate elect to undertake either a master's report or thesis.

Financial Aid

Limited financial aid is available for students electing to pursue the M.R.C.P. degree, ranging from graduate teaching assistantships, research assistantships, scholarships, the work/study program, and occasional tuition stipends to help defray the cost of graduate education. The quantity and amounts vary; information is available upon request.

International students must take and pass the Test of Spoken English (TSE) prior to award of teaching and research assistantships. The tests are administered by the English department at Kansas State University and are typically scheduled the week prior to registration.

Courses in regional and community planning

Undergraduate credit

PLAN 315. Introduction to Planning. (3) I, II. The origins and evolution of planning in response to economic, social, political, and physical problems. The planning process and its relationship to the design professions and the social and behavioral sciences. Three hours rec. a week. Pr.: Sophomore standing. PLAN-315-0-0206

Undergraduate and graduate credit

PLAN 590. Problems in Planning. (1-3) I, II, S. Specific planning problems, including process, theory, method and implementation, under direction of department staff. Pr.: Introduction to Planning. PLAN-590-3-0206

PLAN 630. Computer Applications in Planning and Design. (1-3) I, II, S. The application of computer concepts to problem solving and data analysis in the planning and design professions, including the development of user skills in the application of various software packages for data analysis, mapping, and computer-assisted design. Pr.: CIS 110 and junior standing. PLAN-630-0-1-0206

PLAN 700. Planning Analysis. (3) I, II. Introduction to quantitative methods in planning to measure change in the socioeconomic/political/physical environment and to analyze the interrelations that guide formulation of comprehensive planning. Pr.: PLAN 315 and ECON 555. PLAN-700-1-0206

PLAN 705. Planning Communications. (1-4) I. Study and application of communication concepts and media used in regional and community planning, topics to be selected from: (a) graphics, (b) physical models, (c) professional reports, and (d) public hearings. Pr.: Senior status and PLAN 315. PLAN-705-1-0206

PLAN 710. Urban Visual Analysis. (3) II. Survey and analysis of urban form and space in relation to aesthetic theories and values. Methods of visual perception and analysis are reviewed and applied to contemporary urban form and space. Pr.: PLAN 745. PLAN-710-1-0206

PLAN 715. Planning Principles. (3) I, S. Examination of principles and elements of regional and community planning, including growth forms, physical patterns, planning stages, standards, control measures, and procedures. Pr.: Senior standing and approval of instructor. PLAN-715-0-0206

PLAN 721. Infrastructure Planning and Finance. (3) II. Examination of infrastructure systems, standards, and costs; consideration of policy options and strategies; review of infrastructure finance methods; and implementation of community development with infrastructure planning and finance process. Pr.: PLAN 715 and 9 additional credit hours in planning and/or administration courses. PLAN-721-0-0206

PLAN 725. Planning Theory. (3) I. Review of basic theories of regional and community growth and change; analysis of the process of urbanization in relation to societal determinants and environmental constraints; and the synthesis of a process of planning. Pr.: Senior standing and approval of instructor. PLAN-725-0-0206

PLAN 735. Community Plan Preparation. (3) II. Review of the principles and elements of city growth and change. Criteria and methodology for city analysis and planning are examined and applied to the elements of cities. Pr. or conc.: PLAN 715 or 725. PLAN-735-0-0206

PLAN 736. Community Plan Implementation. (1-4) I. Introduction to legislation and interpretation of codes related to planning, design, and construction. Pr.: PLAN 715. PLAN-736-0-0206

PLAN 740. Small Community and Rural Area Planning. (3) II. Synthesis of small community and rural area change, including socioeconomic/political determinants as bases for community design and plan-

ning. Pr.: PLAN 315 plus 9 credit hours in economics, political science, and sociology. PLAN-740-0-0206

PLAN 745. Urban Design. (3) I, II. Review of recent historical developments of urban form and space. Criteria and methodology for urban design and planning are examined and applied to the elements of cities. Pr. or conc.: PLAN 315 or graduate status. PLAN-745-0-0206

PLAN 746. Urban Design Studio I. (4) I. An interdisciplinary design studio involving large-scale design; projects with extensive time implementation sequence; responses to socioeconomic, cultural, environmental, and technical needs; and implementation strategies. Design methods are applied to selected urban areas of the Midwest. Pr.: PLAN 315 and conc. enrollment in PLAN 745. PLAN-746-1-0206

PLAN 750. Housing Policies and Programs. (3) II. Review and evaluation of historical and current housing issues, production, and financial systems. Examination of federal, state, and local policies and programs for community development. Pr.: PLAN 315. PLAN-750-0-0206

PLAN 755. State and Regional Planning. (3) I. Review of the principles and elements of regional growth and change. Criteria and methodology for regional analysis and planning are examined and applied to the elements of regions. Pr.: PLAN 715 or conc. enrollment. PLAN-755-0-0206

PLAN 760. Community Development Planning. (3) II. Examination of past and present approaches to community development planning in the United States. Review and assessment of community development planning policies, programs, and practices. Pr.: PLAN 715 or conc. enrollment, and 9 semester hours in the social sciences. PLAN-760-0-0206

PLAN 761. Community Development Workshop. (Var.) I, II, S. The organization, planning, design, development, and evaluation of community development projects with real clients and actual locations. Pr.: PLAN 715 and PLAN 760; or conc. enrollment in one of these. PLAN-761-0-0206

PLAN 770. Planning Law. (3) I. Examination of evolution and current state of land use regulation within constitutional limits. Introduction to zoning, subdivision, and other police power controls within a comprehensive planning process. Pr.: PLAN 715. PLAN-770-0-0206

PLAN 780. Planning in Developing Areas. (3) I, II. Examination of comparative regional and community systems of development, consideration of alternative approaches to planning, with emphasis on developing countries and underdeveloped areas in the rural United States. Pr.: PLAN 715 plus nine credit hours from the social sciences. PLAN-780-0-0206

Graduate credit

PLAN 800. Research Methods in Planning. (1-4) II. Considerations in the selection, collection, analysis, and interpretation of regional and community planning data, topics to be selected from: (a) network analysis, (b) computer mapping, (c) statistical analysis programs (SPSS and related), (d) remote sensing, (e) visual analysis, (f) linear programming/modeling, (g) policy and program analysis. Pr.: PLAN 700 and 715, plus one course in statistics. PLAN-800-1-0206

PLAN 805. Internship in Planning. (1-4) I, II, S. Assignment to a planning staff for at least 10 weeks; supervision by a professional planner with periodic reports of activities to planning faculty. Pr.: Completion of two semesters of graduate study in planning. PLAN-805-2-0206

PLAN 810. Practicum in Planning and Development. (Var.) I, II, S. Supervised experience in professional planning and development, including internships, field research, public service, and professional workshops. Pr.: PLAN 715 and 725; or conc. enrollment in one of these. PLAN-810-2-0206

PLAN 815. Seminar in Planning. (1-3) I, II, S. Discussion of contemporary issues in planning within the framework of professional education as a basis for

planning practice. Pr.: Completion of one semester of graduate study. PLAN-815-0-0206

PLAN 820. Planning Administration. (Var.) I. Considerations for the planning director in the administration and management of planning. Pr.: PLAN 715 and completion of 9 credit hours of graduate study in planning. PLAN-820-0-0206

PLAN 835. Growth Management. (3) II. Synthesis of city growth and change in relation to planning theory and socioeconomic/political determinants. Criteria and methodology for growth management are reviewed and applied to the contemporary city. Pr.: PLAN 715 and 755. PLAN-835-0-0206

PLAN 845. Advanced Urban Design. (3) II. Synthesis of urban form and space in relation to aesthetic theories and values and socioeconomic/political determinants. Criteria and methodology for urban design and planning are reviewed and applied to contemporary urban form and space. Pr.: PLAN 745. PLAN-845-0-0206

PLAN 846. Urban Design Studio II. (4) II. Continuation of PLAN 746. Pr.: PLAN 746 and conc. enrollment in PLAN 845. PLAN-846-1-0206

PLAN 847. Urban Design Field Study. (3) I, II, and Intercession. A field investigation of varied large-scale institutions, central business districts, and other mixed-use developments. Pr.: PLAN 745 and PLAN 746. PLAN-847-1-0202

PLAN 855. Regional Planning II. (3) II. Synthesis of regional growth and change in relation to regional landscape, resource, and environmental determinants. Criteria and methodology for regional analysis and planning are reviewed and applied to the elements of the contemporary region. Pr.: PLAN 715. PLAN-855-0-0206

PLAN 880. Topics in Planning. (Var.) I, II, S. The study of selected concepts and trends in regional and community planning and development. Pr.: PLAN 715 or graduate standing. PLAN-880-0-0206

PLAN 899. Research in Planning. (Var.) I, II, S. Original research and advanced study in regional and community planning, urban design, and related fields for thesis or master's report. Pr.: Registration in Graduate School and completion of two semesters of graduate study in planning. PLAN-899-4-0206

Center for Research and Community Services

Richard Forsyth, Director

The Center for Research and Community Services (CRCS) in the College of Architecture and Design coordinates the research and service activities of the College of Architecture and Design's four departments. The center is associated with the graduate programs within the college in architecture, landscape architecture, and regional and community planning. CRCS has three objectives: to develop new knowledge and methods to solve problems related to the planning, design, and management of the built and natural environment; to provide advisory support to planning and design practitioners, business/industry personnel, public agency staff, and special user groups in solving complex planning and design problems; and to assemble and disseminate new knowledge in these areas.

Arts and Sciences

Thomas L. Isenhour, Dean
 William R. Feyerharm, Associate Dean
 Jack M. Holl, Associate Dean
 Marvin A. Kaiser, Associate Dean
 Judith K. Zivanovic, Associate Dean

117 Eisenhower Hall
 532-6900

The College of Arts and Sciences is the home of the liberal arts and is the largest college at Kansas State University. The liberal arts, which include the physical and biological sciences, the fine arts, the social sciences, the humanities, and the quantitative disciplines, embody the core studies of a university education.

The liberal arts seek to develop intellectual skills, such as critical analysis, self-expression, and creativity. Majors in the College of Arts and Sciences range from those related to specific jobs and professions to those related to vocation in a more general and perhaps more fundamental way.

Advising

Students with undeclared, interdisciplinary, and pre-professional majors are advised in the office of the dean. Students with other majors are assigned an advisor by the department head who supervises the majors. In all cases, advisors try to ensure that students design their curricula to meet such goals as: the ability to think, speak, and write with clarity and precision; knowledge of another culture or another language; knowledge and appreciation of science and technology; familiarity with major artistic and literary forms; and exposure to moral and ethical issues.

For those who are uncertain about their majors, or who would prefer to explore a number of academic areas before making a choice, the College of Arts and Sciences provides a general (or undeclared) curriculum. Undeclared majors work with dean's office advisors to devise programs that satisfy basic degree requirements while exploring personal interests and aptitudes before choosing majors.

It is expected that students will declare a major by the end of the sophomore year, or upon completion of 60 credit hours.

Majors and degrees

The undergraduate degrees offered in the College of Arts and Sciences are: bachelor of arts, bachelor of fine arts, bachelor of music, bachelor of music education, and bachelor of science. In addition, the associate of arts and the associate of science degrees with unspecified majors are offered at Fort Riley.

Below in the left column are majors, options, advising programs, and degrees offered. In the right column are names of the departments under which the major programs are offered. The specific requirements for a degree in the various curricula may be found in the department listings later in the College of Arts and Sciences catalog section.

| | | | |
|--|--|---|--|
| Anthropology, B.A. or B.S. | Sociology, anthropology, and social work | Microbiology, B.A. or B.S. | Biology |
| Art, B.A. or B.F.A. | Art | Modern languages, B.A. | Modern languages |
| Biochemistry, B.A. or B.S. | Biochemistry | Music, B.A. or B.M. | Music |
| Biology, B.A. or B.S. | Biology | Music education, B.M.E. | Music |
| Chemical science, B.A. or B.S. | Chemistry | Philosophy | Philosophy |
| Chemistry, B.A. or B.S. | Chemistry | Interdisciplinary, B.A. or B.S. | |
| General textile | | Pre-business, B.A. or B.S. | |
| Computer science, B.A. or B.S. | Computing and information sciences | Pre-law, B.A. or B.S. | |
| Economics, B.A. or B.S. | Economics | Pre-ministry, B.A. | |
| English, B.A. | English | Traditional, B.A. | |
| Creative writing | | Physical education, B.A. or B.S. | Physical education and leisure studies |
| Literature | | Elementary | |
| Teaching certification | | Exercise science | |
| Fisheries and wildlife biology, B.A. or B.S. | Biology | Human movement | |
| Fisheries biology | | K-12 | |
| Wildlife biology | | Secondary | |
| General | | Physics, B.A. or B.S. | Physics |
| General (advising program) | Dean's office | Political science, B.A. or B.S. | Political science |
| Geography, B.A. or B.S. | Geography | General | |
| General | | Public administration | |
| Pre-planning | | Pre-dentistry, B.A. or B.S. | Dean's office |
| Geology, B.A. or B.S. | Geology | Pre-law (advising program) | Dean's office |
| Geophysics, B.A. or B.S. | Geology | Pre-medicine, B.A. or B.S. | Dean's office |
| History, B.A. or B.S. | History | Pre-nursing (advising program) | Dean's office |
| Information systems, B.A. or B.S. | Computing and information sciences | Pre-optometry (advising program) | Dean's office |
| Interdisciplinary | Dean's office | Pre-pharmacy (advising program) | Dean's office |
| Humanities, B.A. | | Dean's office | |
| Life science, B.A. or B.S. | | (advising program) | |
| Physical science, B.A. or B.S. | | Pre-veterinary medicine* (advising program) | Dean's office |
| Social science, B.A. or B.S. | | Psychology, B.A. or B.S. | Psychology |
| Journalism and mass communications, B.A. or B.S. | Journalism and mass communications | Radio—television, B.A. or B.S. | Journalism and mass communications |
| Advertising | | Social work, B.A. or B.S. | Sociology, anthropology, and social work |
| General | | | |
| Journalism | | Sociology, B.A. or B.S. | Sociology, anthropology, and social work |
| Public relations | | General | |
| Leisure studies, B.A. or B.S. | Physical education and leisure studies | Society and criminal justice | |
| Recreation and park management | | Speech, B.A. or B.S. | Speech |
| Therapeutic recreation | | General | |
| Mathematics, B.A. or B.S. | Mathematics | Linguistics | |
| Medical technology, B.A. or B.S. | Dean's office | Speech Pathology, B.A. or B.S. | Speech |
| | | Statistics, B.A. or B.S. | Statistics |
| | | Theatre, B.A. or B.S. | Speech |
| | | Dance | |

Secondary majors

Secondary majors are those majors which can be taken only in addition to the primary majors listed above. The secondary majors in the college are: American ethnic studies, gerontological studies, industrial labor relations, international studies, Latin American studies, South Asia studies, and women's studies.

* Students who complete pre-veterinary medicine requirements in the College of Arts and Sciences will be eligible for the bachelor of science degree from the College of Arts and Sciences upon completion of the second professional year in the College of Veterinary Medicine.

General Requirements

General education requirements

Requirements in general education are to be fulfilled by courses chosen by students in consultation with their advisors. The aim of these requirements is to provide breadth in the major areas of knowledge outside the field of specialization. Introductory and intermediate-level courses are available for this purpose in departments in natural sciences, social sciences, and humanities. *Courses numbered below 100 may not be applied toward a degree.*

Requirements common to the bachelor of arts and bachelor of sciences degrees

120 credit hours required for graduation

Physical education

Purpose: to give a foundation in the principles of physical exercise and fitness.

PE 101 Principles of Physical Fitness 1

Basic rhetoric

(Three courses, 8 credit hours minimum)

Purpose: to give students practice in writing and analyzing expository and argumentative prose and in oral presentation.

| | | |
|----------|--------------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or** | |
| SPCH 325 | Argumentation and Debate | 3 |
| | or** | |
| SPCH 321 | Public Speaking II | 3 |

**As recommended by Department of Speech

A major

Purpose: to ensure some depth and detail in at least one field of knowledge.

Satisfaction of requirements for any of the majors in the College of Arts and Sciences (see list earlier in this section). With careful scheduling, it is possible to complete an additional major, a secondary major, or pre-professional requirements, as well.

Basic disciplines

Purpose: The aim of the requirement in the humanities is to encourage and to enable students to recover "a heritage so important that to lose it would be to lose the very qualities that make men and women greater than the systems they devise and mark the difference between a society of robots and a community of civilized human beings." The aim of the requirement in the sciences is to ensure that students gain an immediate acquaintance with the general principles of scientific method and with the different shapes the scientific enterprise takes in the physical sciences, the life sciences, and the social sciences.

Up to two courses from one department may be used to fulfill the distribution requirements for humanities and the social sciences. They may be used at the same time to count towards the student's major. No course may be used to satisfy more than one specific requirement for humanities and social sciences. Only courses taken for 2 or more credit hours satisfy these requirements; courses in excess of 5 credit hours count as two courses.

Humanities (four courses, one course each section, 11 credit hours minimum):

Fine arts (one course)

Purpose: to ensure some interpretive or expressive competence in a traditional nonliterary mode of artistic expression.

Choose from the following:

Anthropology—ANTH 515 or 517

Art—ART 305 or 400

Art history—any course

Art technique—ART 200 to 799

Dance—DANCE 205, 323, 324, 325, 326, or 371

History—HIST 459

Music—MUSIC 200, 201, 245, 250, 255, 280, 310, 385, 420, 424, 455, 480, 570, 601, 602, or 650.

Theatre—THTRE 260 to 799

Philosophy (one course)

Purpose: to ensure some interpretive or expressive competence in the fundamental conceptual issues of human thought and activity.

Choose any philosophy course except PHILO 110, 220, or 510.

Western heritage (one course)

Purpose: to ensure some interpretive or expressive competence regarding the institutions, traditions, and values that have shaped Western civilization.

Choose from the following:

History—courses dealing with the Greco-Roman, Western European, or North American experience

Constitutional law—POLSC 613, 614, 615, 616, or 799

Women's studies—Women's Studies xxx 105, 405, or 506

American ethnic studies—xxx 160

Political thought—POLSC 301, 661, 663, 667, 671, 675, or (SOCIO) 709

Western humanities—ENGL 230, 231, 233, or 234

Foreign civilizations—FREN 514, GRMN 530, SPAN 565, or SPAN 566

Music—MUSIC 245

Speech—SPEECH 460

Literary or rhetorical arts (one course)

Purpose: to ensure some interpretive or expressive competence in a traditional literary or rhetorical mode of artistic expression.

Choose from the following:

English—literature or creative writing—ENGL 250 to 799 **except** 301, 400, 401, 405, 415, 490, 492, 499, 520, 530, or 796

Modern languages—literature courses including literature in translation

Theatre—THTRE 562, 764, 870, 871, 873, or 874

History of rhetoric—SPCH 330, 335, 430, 432, 434, 460, 725, 730, 732, or 733

Exception: Students in B.S. programs who take two courses in one foreign language may use these to satisfy the requirements for Western heritage and for literary and rhetorical arts.

Social sciences (four courses, 12 credit hours minimum, from three disciplines):

Purpose: to acquaint the student with the adaptation of scientific method to the analysis of human social systems.

One course must be at 500 level or above, or carry a prerequisite in the same department.

Three of the four courses must be from these areas:

Psychology—any course

Sociology—any course

Cultural anthropology—including archaeology

Geography—except GEOG 220 or 221

Economics—any course

Political science—any course

History—any course

The fourth course must be from the above areas or from:

Women's studies—Women's Studies xxx 105, 405, or 506

Gerontology—DAS 315 or 415

Linguistics—except LG 601

Speech—SPCH 323, 435, 520, 720, or 726

Journalism and mass communications—JMC 235, 530, 612, 660, 665, or 685, or RTV 300, 660, or 675

Physical education—PE 320, 340, or 435

Anthropology—ANTH 640

Natural sciences (three courses, 11 credit hours minimum):

Life sciences (one course with laboratory)

Purpose: to introduce students to the systematic study of organisms and their interrelationships.

Choose from the following:

Biology—any course

Biochemistry—any course

Paleobiology—GEOL 581 or 704

Physical anthropology—ANTH 280, 281, 688, 691, 694, or 695

Physical sciences (one course with laboratory)

Purpose: to introduce students to the appropriate attitudes and methods which characterize the systematic study of matter and energy.

Choose from the following:

Physics—any course

Chemistry—any course

Environmental geography—GEOG 220 or 221

Geology—any course except GEOL 581 or 704

Additional natural science course selected from life sciences or physical sciences lists above.

International studies overlay (one course):

Purpose: to equip students better to become citizens of a world where the most important problems are unavoidably defined in international terms and to understand cultures of the world outside the Western tradition.

A student must take one course of which at least half is devoted to: economic, political, and social relations or interactions between or among different countries, in which the major focus is upon the interdependency of nations of the modern world; or contemporary features or historical traditions of non-Western cultures (excluding those dealing primarily with Greek, Roman, Western European, or North American experience).

Note: Students may satisfy the international studies requirement at the same time they satisfy requirements in the major, in the humanities, or the social sciences. These courses qualify:

Agricultural economics—AGEC 615

Anthropology—ANTH 200, 220, 260, 505, 506, 507, 508, 511, 512, 515, 517, 536, 545, 550, 604, 618, 630, 634, 640, 673, or 676

Economics—ECON 505, 506, 636, 681, or 682

Geography—GEOG 100, 200, 201, 505, 506, 620, 640, 650, 710, or 715

History—HIST 250, 350, 504, 505, 506, 514, 543, 544, 545, 561, 562, 564, 576, 577, 591, 592, or 598

Journalism and mass communications—JMC 670

Management—MANGT 690

Marketing—MKTG 544

Modern languages—RUSSN 250, 504, 508, or 552

Political science—POLSC 333, 505, 506, 511, 545, 622, 623, 624, 625, 626, 627, 628, 629, 642, 645, 647, 649, 651, 652, or 653

Sociology—SOCIO 505, 506, or 742

Note: Students may use the fourth course in a single foreign language sequence (other than Latin) to satisfy the international studies overlay requirement.

Additional requirements for the B.A.

Foreign language

(The four basic courses, 15 credit hours, in one of the foreign language sequences in the Department of Modern Languages, or equivalent competency)

Purpose: to bring students to a point at which they are able to proceed on their own to a command of a second language—a key for access both to a foreign culture and to much primary and secondary material in many special fields.

Mathematics

(One 3-credit-hour course, 100 level or above, or any other course for which there is a mathematics prerequisite)

Purpose: to give students a college-level competence in mathematical reasoning and analysis.

Note: Any course used to satisfy this requirement cannot be used to satisfy any other general education requirement.

Additional requirements for the B.S.

Natural sciences

(One course, 3 credit hours minimum, with a prerequisite in the same department; for this requirement, biochemistry courses with a chemistry prerequisite qualify as upper-level courses.)

Purpose: to give students who elect the bachelor of science degree an especially solid foundation in the natural sciences.

Courses that qualify are those listed earlier under natural sciences, and:

Physical education—PE 330 or 335

Psychology—PSYCH 470, 480, or 616

Quantitative and abstract formal reasoning

Purpose: to give the student training in a clear, nonambiguous, simplified language for the efficient transfer and logical analysis of information—a language in which a good deal of discussion is conducted in the sciences.

A course that satisfies this requirement may at the same time be used to satisfy any major requirement for which it qualifies.

Fulfill this requirement one of three ways:

1. Three courses, 9 credit hours minimum, selected from:
 - Computer science—100 level or above
 - Mathematics—100 level or above
 - Philosophy—PHILO 110, 220, or 510
 - Statistics—any course
2. One course and its Level II prerequisite, selected from:
 - Geography—GEOG 700
 - Physical education—PE 710
 - Physics—PHYS 113
 - Sociology—SOCIO 520 or 725
 - Social Work—SOCWK 519

3. Equivalent competency:

Competency may be demonstrated by taking two Level II courses or a Level III course from:

Level II courses:

Computer science—CIS 200 and one of the labs CIS 203, 204, 206, or 208

Mathematics—MATH 150, 201, or 205

Philosophy—PHILO 510

Statistics—STAT 320, 330, 340, 350, 702, or 703

Level III courses:

Computer science—CIS 300 or 350

Mathematics—MATH 210 or 220

Philosophy—PHILO 701

Statistics—STAT 341, 351, 704, or 705

Bachelor of fine arts

120 hours required for graduation

The bachelor of fine arts degree is a professionally oriented undergraduate degree in art. Emphasis is on actual practice in the creative art disciplines. The degree is considered the appropriate preparation for the master of fine arts degree, which is recognized as the terminal degree in studio arts, and for the master of arts in art therapy, which is required for certification as an art therapist. The B.F.A. in art is a four-year, 120-credit-hour program with emphases possible in painting, sculpture, ceramics, graphic design, printmaking, metalsmithing and jewelry, drawing, and pre-art therapy. The degree requirements are as follows:

General education (45 hours)

Communications—English composition, two courses; and oral communication, one course

Social sciences—two courses

Humanities—three courses

Philosophy or mathematics—one course

Natural sciences—two courses, one with a lab

General electives—11–19 hours

Physical education—PE 101, Principles of Physical Fitness

Art courses (75 credit hours)

Core—39 hours

Major—20 hours

Art electives and related courses—16 hours

Bachelor of music

126 credit hours required for graduation

Areas of concentration offered in this curriculum are: all instruments, voice, theory, and composition. A secondary performance area also is required.

General requirements (42 hours)

| | | |
|--------------------|--------------------------------|---------------------|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 106 | Public Speaking I | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| PHYS 101 | The Physical World I | 3 |
| PSYCH 110 | General Psychology | 3 |
| Nonmusic electives | | minimum of 9 |
| Modern language | | two courses minimum |

The remaining hours are to be taken in the area of concentration. For specific music requirements, see the Music section of this catalog.

Bachelor of music education

134–135 credit hours required for graduation, depending on emphasis

The program of study leading to this degree is a nine-semester curriculum designed to prepare music teachers for grades K–12. With careful planning and enrollment during summer session(s) all requirements may be completed in four years. Within this curriculum there are two optional emphases—one in vocal/choral music, the other in instrumental music.

General education requirements:

| | | |
|---|---|-----|
| ENGL 100 | English Composition I | 3 |
| | and | |
| ENGL 120 | English Composition II | 3 |
| | or | |
| ENGL 110 | English Honors Composition I | 3 |
| | and | |
| ENGL 125 | English Honors Composition II | 3 |
| SPCH 106 | Public Speaking I | 3 |
| Literature elective (ENGL 260, 265, 280, 285, 360, 365, 370, or 375) | | |
| | Modern language (two courses in the same language) | 3 |
| | or | |
| | One course in computer science | 3–8 |
| PSYCH 110 | General Psychology | 3 |
| One course in American or world history (HIST 101, 102, 251, or 252) | | |
| ANTH 200 | Introduction to Cultural Anthropology | 3 |
| MATH 100 | College Algebra (or other math course having college algebra as a prerequisite) | 3 |
| Biological science | | |
| | Physical science (one of these two courses must include a lab) | 3–4 |
| PE 101 | Principles of Physical Fitness | 1 |
| Humanities electives to complete a total of 50 hours required general education | | |

The remaining hours are to be taken in the area of concentration. For specific music requirements, see the Music section of this catalog.

Associate of arts at Fort Riley

Sixty hours, taken only at Fort Riley, including the following general requirements:

English—ENGL 100 and 120

Speech—SPCH 105 (or one course), courses subject to approval by Department of Speech

Modern languages—two years in one language or equivalent competence

Mathematics—one course

Humanities—three courses from: art, dance, English, history, modern languages, music, philosophy, speech, and Introduction to Women's Studies. No more than three courses in history may be used to fulfill humanities and social sciences requirements.

Social sciences—three courses from: anthropology, economics, geography (excluding GEOG 220 and 221), history, political science, psychology, sociology, social work, journalism and mass commun-

ications, and Introduction to Women's Studies. No more than three courses in history may be used to fulfill humanities and social sciences requirements.

Natural sciences—four courses, including one laboratory course and one course which has a prerequisite in the same department: biochemistry, biology, chemistry, computer science, geography, (GEOG 220 and 221 only), geology, mathematics, physics, or statistics

Physical education—PE 101, Principles of Physical Fitness

Associate of science at Fort Riley

Sixty hours including the following general requirements:

English—ENGL 100 and 120

Speech—SPCH 105 (or one course), courses subject to approval by Department of Speech

Humanities and social sciences—seven courses, taken from at least two departments, including one course in philosophy, from: anthropology, art, dance, economics, English, geography (excluding GEOG 220 and 221), history, modern languages, music, philosophy, political science, psychology, sociology, social work, speech, journalism and mass communications, and Introduction to Women's Studies

Natural sciences—four courses, including one laboratory course and one course which has a prerequisite in the same department: biology, biochemistry, chemistry, computer science, geography (GEOG 220 and 221 only), geology, mathematics, physics, or statistics

Physical education—PE 101, Principles of Physical Fitness

Program Options

Honors program

The honors program offers intellectually able and motivated students experiences in the humanities and in the social-behavior and natural sciences that are challenging and unusual in breadth and focus. By stressing liberal studies in the sophomore year, interdisciplinary study in the junior year, and independent study in the senior year, the honors program enables students to develop broad intellectual interests.

The honors program further enriches the experiences of its members by creating opportunities for them to develop a sense of community and to meet faculty and distinguished guests of the University in informal settings.

Students may be admitted to the honors program during the freshman year. Admission requires completion of a noncredit seminar, Introduction to the Honors Program in Arts and Sciences, and achievement of a grade point average of

3.5 in course work completed as a full-time student during one semester of the freshman year. A student who satisfies those requirements may meet with the director of the honors program and petition to join. Once admitted, a student must maintain an overall grade point average of 3.3.

Students accepted into the honors program are expected to enroll in an honors section of ENGL 125, English Composition II. Students must complete: two seminars, one in social sciences or humanities and one in the natural sciences or mathematics, during the sophomore year; an interdisciplinary colloquium, incorporating perspectives of both the humanities and the sciences, during the junior year; and an independent study, under the supervision of a faculty member of the student's choice, during the senior year.

The senior study is conducted at a beginning professional level and culminates in an honors thesis or other documentation of performance, which is filed with the director. This project is invaluable as evidence of a student's ability to organize and complete a study independently. It provides evidence of capability to do well in graduate studies and may enable the student to strengthen significantly an application to graduate school. It may also help make the case for a scholarship application or serve as the germ for more detailed investigation later in the student's career. Honors students are encouraged to complete a four-course sequence in a modern language other than English.

All phases of the honors program emphasize writing, both as a method of demonstrating one's understanding of a subject, and as a strategy for developing one's thinking skills.

In addition to the curricular options described, students in the honors program have many opportunities to individualize their courses of study. Student-designed curricular plans may be approved with the consent of department heads involved, the director of the honors program, and the dean of the college. Students are also encouraged to propose other plans in their course work, including off-campus learning experiences which may be supplemented by reading, discussion, and reporting for course credit with the approval of the proper supervising faculty.

A transfer student or other upperclassman who has a grade point average of 3.5 and who receives a positive evaluation by the director may be admitted to the honors program as late as the beginning of the junior year. Persons who wish to be considered for late admission should contact the director.

For more information, contact the assistant dean for honors program, College of Arts

and Sciences, Eisenhower Hall, Manhattan, Kansas 66506-1005.

DAS 010. Introduction to the Honors Program in Arts and Sciences. (0) I, II. Direction and goals for the honors program in the College of Arts and Sciences. Meets four to six times during the semester. DAS-010-0-4900

DAS 388. Honors Internship. (1-3) I, II, S. A scholarly investigation related to activities in a place of employment or in a volunteer situation. Written and oral presentations are required. Pr.: Concurrence of a faculty advisor and approval of the arts and sciences honor program advisory council. DAS-388-2-4900

DAS 399. Junior Honors Colloquium. (3) I, II. An interdisciplinary colloquium whose topics change each semester. Consistently incorporates perspectives of sciences and humanities. Pr.: Non-credit seminar, Introduction to Honors Program in Arts and Sciences, and two honors program sophomore seminars. DAS-399-0-4900

Freshman Seminar

Freshman Seminar introduces students to what a university is, the purpose of a university education, and what it means to be an educated person. This is done, not through a lecture approach, but through sharing the varied cultural and intellectual activities that occur at Kansas State University, demonstrating by example the characteristics of educated persons and the importance of higher education.

DAS 100. Freshman Seminar. (2) I. An introduction to the intellectual and cultural life of Kansas State University. DAS-100-0-4901

Study Abroad

Walter F. Kolonosky, Director
23 Eisenhower Hall
532-6760

The Office of Study Abroad should be the first stop for students who wish to study in another country for a year, a semester, a summer, or an intersession.

In addition to a number of good language programs, there are opportunities to study almost every subject from art to zoology in Africa, Asia, Canada, Latin America, and Europe. Every attempt is made to insure the best match between the interests of a student and the ingredients of a program sponsored by us or by another institution.

Students may apply for scholarships, such as the Fulbright or the Pearson, or scholarship-exchanges, such as the K-State/Justus Liebig year abroad. Through the International Student Exchange Program it is possible to study for a semester or a year at one of 100 colleges and universities outside the U.S. for the same cost as tuition, room, and board at K-State. Financial aid from almost every agency is applicable to all credit-earning programs.

Summer independent reading program

Each summer the College of Arts and Sciences offers an opportunity for students to read six books independently during their summer holidays for 2 hours of

academic credit. Each year two books are chosen in the humanities, two in the social sciences, and two in the natural sciences; the books chosen are all intelligible to the nonspecialist, are usually current paperbacks, and are frequently controversial.

In the fall, students meet in three small two-hour seminars moderated by a faculty member. A written examination is given for each pair of books and the course appears on the student's transcript of courses for the fall term. The course may be taken on the A/Pass/F basis.

Students wishing to take the course should enroll in arts and sciences course DAS 199 during the spring preenrollment period preceding the summer they wish to do the reading. If the decision to take the course is made at a later time a student should see an advisor in the dean's office.

DAS 199. Summer Independent Reading Program. (2) DAS-199-3-4901

Linguistics

The Departments of English, Modern Languages, Speech, and Sociology, Anthropology, and Social Work offer cross-listed linguistics courses available for either graduate or undergraduate credit.

The courses provide students in education, anthropology, foreign languages, psychology, philosophy, literature, and other areas an opportunity to appreciate both the rich structure of language itself and the relationships between their disciplines and linguistic studies.

For further information about linguistics courses, contact either the participating departments or the linguistics advisor in 110 Leasure Hall.

Liberal arts with secondary teacher certification

An arts and sciences major may apply some elective hours toward the requirements for secondary teacher certification. In most arts and sciences departments, the student can complete the academic major and earn certification within the 120 hours of course work required for a degree. Because the teacher training courses are offered through the College of Education, a student who chooses to combine these two programs is entitled to two advisors, one in the major field of study, the other in secondary education.

By combining a traditional academic major with teaching certification, a student can be assured of varied choices after graduation. The liberal arts degree will equip a student to pursue graduate or professional study or to apply the education to a career. By pursuing an arts and sciences major, students also have the option of working toward a bachelor of arts degree and studying a foreign language. In addition, the teaching certification will qualify a

graduate to teach in a public secondary school. For specific certification requirements in secondary education, see the College of Education section of this catalog.

Liberal arts with business preparation

For students who wish to pursue careers in business, the liberal arts provide excellent preparation in the communication, analytic, problem-solving, and interpersonal skills required of young executives. Such skills are developed and refined through rigorous course work in the humanities, social sciences, natural sciences, and quantitative sciences. Proficiency with a foreign language (a requirement for the B.A.) is also highly desirable.

A student interested in pursuing this route to a career in business may, with careful planning and in consultation with a dean's office advisor, construct a degree program based on an arts and sciences major, supplemented by a concentration of business-related courses. While majors in economics, English, history, modern languages, political science, psychology, or sociology might be among the most obvious choices for pre-business preparation, many other arts and sciences majors are equally appropriate.

Most liberal arts majors require only 30-36 credit hours in the major field, approximately one-fourth of the total 120 hours required for a B.A. Most of the courses M.B.A. programs expect entering students to have completed are basic liberal arts courses: economics, calculus, computer science, statistics, etc. Some of these can apply toward the general distribution requirements, which total approximately 60 hours. That leaves approximately 30 hours of free electives that may be used to create a pre-business area of concentration drawing from courses offered by both the College of Business Administration and the College of Arts and Sciences. Such a degree would also qualify a student for certain entry-level positions in business if he or she did not wish to go directly to graduate school.

The College of Arts and Sciences dean's office maintains a lending library of information, catalogs, and application materials for M.B.A. programs. Interested students are invited to use these materials and to consult with an advisor in the Advising Center, 112 Eisenhower Hall, 532-6904.

Interdisciplinary majors

Interdisciplinary majors provide an opportunity for students to organize their interests within a broad area of study rather than within the narrower focus required by a major in a single discipline. Students who want to create their own fields of emphasis and students who are eager to pursue

multidisciplinary solutions to complex problems often choose an interdisciplinary major. Other students choose interdisciplinary study as a second major, adding it to a departmental major in order to gain expertise in complementary areas.

The College of Arts and Sciences offers four interdisciplinary majors:

| Major | Degree(s) | Credit hrs. |
|------------------|--------------|-------------|
| Humanities | B.A. only | 30 |
| Life science | B.S. or B.A. | 36 |
| Physical science | B.S. or B.A. | 36 |
| Social science | B.S. or B.A. | 36 |

The requirements for each of the interdisciplinary majors are sufficiently flexible to allow individual students, in consultation with their advisors, to devise degree programs designed to meet their particular needs, interests, and career goals.

Interdisciplinary majors are advised in the College of Arts and Sciences dean's office. For more information about these majors, students may call 532-6900 or stop by 113 Eisenhower Hall.

Humanities

Humanities disciplines are those which deal with various aspects of culture. They include art, dance, theatre, history, languages, literature, music, philosophy, and speech. The humanities major leads to a bachelor of arts, the traditional liberal arts degree. The intellectual training and cultural appreciation students acquire through humanistic study enable them to apply humanistic values and perspectives toward solutions to the problems of today and tomorrow.

Note: This major is under review. See advisor for new requirements, fall 1990 and following.

Life sciences

Life science is a multidisciplinary major which deals with studies of living organisms and life processes.

| | | |
|---------------|---|-----|
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| BIOL 120 | Introductory Organic and Biological Chemistry | 5 |
| | or | |
| BIOCH 201/202 | Elementary Biochemistry and Lab | 5 |
| | or | |
| BIOCH 350/351 | General Organic Chemistry and Lab | 5 |
| BIOL 455 | Microbiology | 4 |
| ANTH 280/281 | Introduction to Physical Anthropology and Lab | 4 |
| | Psychology course with prerequisite | 3 |
| Electives | | 11* |
| | | 36 |

The 11 remaining elective hours must be selected from two or more of the following fields: biochemistry, biology, microbiology, organic chemistry, physical anthropology, and psychology. At least two of these courses must have a prerequisite. A

2.0 GPA is required in the major for graduation.

Physical science

Physical science is a multidisciplinary major which deals primarily with nonliving matter. It concerns itself with the theoretical and observable natural phenomena of our world and universe.

| | | |
|--------------|------------------------------|------|
| MATH 150 | Plane Trigonometry | 3 |
| MATH 220 | Analytic Geometry/Calculus I | 4 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| PHYS 113 | General Physics I | 4 |
| | or | |
| PHYS 213 | Engineering Physics I | 5* |
| | and | |
| PHYS 114 | General Physics II | 4 |
| | or | |
| PHYS 214 | Engineering Physics II | 5 |
| GEOL 100/130 | Introductory Geology and Lab | 4 |
| | or | |
| GEOL 105/130 | Oceanography and Lab | 4 |
| | or | |
| GEOG 220 | Environmental Geography | 4 |
| Electives | | 6-9* |
| | | 36 |

*Electives must be selected from among: chemistry, geology, mathematics, and physics; GEOG 221. At least 6 elective hours must have a prerequisite. (*Note: PHYS 213 requires MATH 221, which may be counted as an elective.) A 2.0 GPA is required in the major for graduation.

Social science

Social science is a branch of learning that examines society's institutions—their structures, theoretical foundations, evolution, and interrelationships—and how they affect and are affected by human behavior. The social science disciplines include anthropology, economics, geography, history, political science, psychology, and sociology.

A student seeking admission to the program must submit a plan of study to an interdisciplinary social science advisor in the College of Arts and Sciences for approval. This proposal must include a rationale or thematic design for the interdisciplinary degree and a tentative listing of courses. The student's social sciences advisor may encourage him or her to confer with other social science faculty members who have special expertise in the area of the student's interest. This procedure should be accomplished before or during the semester in which the student completes 60 hours of university credit.

A total of 36 credit hours must be completed with at least 3 credits being completed in each of four different social science disciplines.

At least 9 credit hours must be completed in one social science discipline, including at least one course at the 500-799 level.

At least 15 credit hours must be completed in social science disciplines at the 500-799 level.

No more than 9 credit hours may be counted toward both the general requirements and the major.

A 2.0 GPA in the major is required for graduation.

Students must complete at least one course in social science research methods or data analysis. This course may be selected from: GEOG 700, Quantitative Analysis in Geography; HIST 586, Junior Seminar in History; POLSC 400, Political Inquiry and Analysis; POLSC 700, Research Methods in Political Science; PSYCH 350, Experimental Methods in Psychology; SOC 520, Methods of Social Research; STAT 330, Elementary Statistics for the Social Sciences.

Pre-professional programs

DAS 015. Orientation to Health Professions Careers. (0) I, II. Acquaints students whose career goals are in the health professions fields with the varieties of options available and with the corresponding academic requirements. Discussion covers an introduction to the personal responsibilities that health-care workers assume and the impact of social and economic problems on our health-care delivery system. DAS-015-0-1201

Medical technology

The medical technology curriculum requires 90 semester hours of preclinical courses and 12 to 18 months of work at one of the affiliated clinical programs in Kansas City, Topeka, or Wichita. Admission into that portion of the training is by application; students are expected to have a minimum GPA of 2.0 to 2.5 for both overall work and for the required science courses. All the requirements for a bachelor's degree must be completed before a student is allowed to sit for the certification examination.

In addition to the general requirements for a bachelor's degree in the College of Arts and Sciences, the following courses are required:

Preclinical courses

| | | |
|------------------|---|---|
| STAT 320 | Elements of Statistics | 3 |
| | or | |
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |
| | or | |
| STAT 340 | Biometrics I | 3 |
| One math course* | | 3 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Laboratory | 2 |
| | or | |
| CHM 271 | Chemical Analysis | 4 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 455 | Microbiology | 4 |
| BIOL 670 | Immunology | 4 |

Two of the following courses:

| | | |
|------------------------------------|-------------------------|----|
| BIOL 240 | Human Body | 6 |
| BIOL 530 | Pathogenic Microbiology | 3 |
| BIOL 545 | Parasitology | 4 |
| | and | |
| BIOL 546 | Parasitology Laboratory | 1 |
| B.S. general education requirement | | 39 |

Highly recommended courses:

| | | |
|-----------|------------------------------------|---|
| BIOL 400 | Human Genetics | 3 |
| BIOL 671 | Immunology Laboratory | 2 |
| CIS 110 | Introduction to Personal Computers | 3 |
| PHYS 114 | Descriptive Physics | 4 |
| MANGT 420 | Management Concepts | 3 |

Either CHM 271 or BIOCH 522—whichever was not taken above

*MATH 110 does not fulfill this requirement.

Clinical courses

DAS 401. Clinical Microbiology. (6-8) II. The theory and laboratory study of pathogenic bacteria, viruses, rickettsiae, fungi, and parasites. Includes morphology, physiology, taxonomy, and medical significance. DAS-401-2-1223

DAS 402. Clinical Chemistry. (6-8) I. Theory and laboratory study of analytical biochemistry, incorporating both routine and special chemical procedures. DAS-402-2-1223

DAS 403. Clinical Hematology. (4-6) S. Study of blood cell derivation, maturation, and function, principles of hemostasis, and blood coagulation. Methodology used in routine and special hematology studies. DAS-403-2-1223

DAS 404. Clinical Immunology. (2-6) I. Immunohematology, the study of fundamentals of antigen-antibody reactions, blood groups and types, crossmatches, blood components, and the laboratory methods used in immunohematology studies; and serology, the theory of immunologic responses and procedures used in determination of serological studies. DAS-404-2-1223

DAS 405. Topics in Medical Technology. (3-6) II. Basic principles and practices of the medical laboratory, techniques and special projects. DAS-405-2-1223

Pre-dentistry

U.S. dental schools require applicants to have satisfactorily completed a specified set of courses and to present acceptable scores on the Dental Admission Test. The majority of entrants earn bachelor's degrees prior to matriculating.* The courses listed in the pre-dental major satisfy the admission requirements for most dental schools.

| | | |
|----------|--|---|
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| CHM 531 | Organic Chemistry I | 3 |
| CHM 532 | Organic Chemistry Laboratory | 2 |
| CHM 550 | Organic Chemistry II | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| | Biology electives (400 level or above) | 8 |
| MATH 100 | College Algebra | 3 |
| MATH 150 | Plane Trigonometry | 3 |

*Students who enter dental school after completing only 90 credit hours, which include the courses listed in the pre-dental major and the general education requirements for the B.A. or B.S. degree, may complete degree requirements by transferring 30 credit hours from an accredited dental school.

Additional information may be obtained in the College of Arts and Sciences dean's office.

DAS 240. Practicum in Pre-Dentistry. (1) I, II, S. Forty hours are spent observing the practice of dentistry at Fort Riley Dental Clinic. Students are under the supervision and direction of individual dentists.

Pr.: Sophomore standing, permission of the pre-dentistry advisor. DAS-240-2-1205

Pre-medicine

Medical schools in the United States require applicants to have satisfactorily completed a bachelor's degree before matriculating,* to include a series of required courses in their studies, and to present acceptable scores on the Medical College Admission Test. Kansas residents are given preference at the University of Kansas Medical School. The courses listed below constitute the pre-medical major and fulfill the course requirements at most U.S. medical schools and at the University of Kansas Medical School.

| | | |
|----------|-------------------------------------|---|
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 271 | Chemical Analysis | 4 |
| CHM 531 | Organic Chemistry I | 3 |
| CHM 532 | Organic Chemistry Laboratory | 2 |
| CHM 550 | Organic Chemistry II | 3 |
| CHM 551 | Organic Chemistry II Laboratory | 2 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| | or | |
| MATH 205 | General Calculus and Linear Algebra | 3 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 400 | Human Genetics | 3 |
| | or | |
| ASI 500 | Genetics | 3 |
| BIOL 510 | Embryology | 3 |
| BIOL 511 | Embryology Laboratory | 1 |

*Applicants for whom the degree requirement is waived, and who enter medical school before completing the bachelor's degree and who have completed all the general education requirements and the major for the B.A. or B.S. degree, may complete degree requirements by transferring 30 semester hours from an accredited medical school.

Additional information may be obtained in the College of Arts and Sciences dean's office.

Pre-optometry

In order to apply for admission to a school of optometry, students are expected to have successfully completed at least three years of college work including a set of specified science and math courses and to have taken the Optometry Admission Test. Students must receive a bachelor's degree before the optometry degree will be granted.

The following courses satisfy the admission requirements at most optometry schools:

| | | |
|-----------|--|---|
| MATH 100 | College Algebra | 3 |
| MATH 150 | Plane Trigonometry | 3 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| BIOL 455 | Microbiology | 4 |
| BIOL 240 | Structure and Function of the Human Body | 6 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| PSYCH 110 | General Psychology | 3 |
| STAT 320 | Elements of Statistics | 3 |
| | Social sciences electives | 6 |
| | Psychology elective | 3 |

These courses also fulfill most of the requirements for the other schools of optometry. The list does not constitute a major toward an undergraduate degree.

Pre-veterinary

Seventy-one semester hours are required for students applying for admission to the freshman class entering the College of Veterinary Medicine.

| | | |
|-----------|---|----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Laboratory | 2 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 510 | Embryology | 3 |
| BIOL 511 | Embryology Laboratory | 1 |
| BIOL 455 | General Microbiology (with lab) | 4 |
| ASI 102 | Principles of Animal Science | 3 |
| ASI 103 | Dairy Science | 1 |
| ASI 104 | Poultry Science | 1 |
| ASI 105 | Animal Sciences and Industry | 1 |
| ASI 318 | Fundamentals of Nutrition | 3 |
| ASI 500 | Animal Genetics | 3 |
| | Social sciences and/or humanities electives | 12 |
| | | 71 |

Because the pre-veterinary curriculum is not a degree-granting program, students in arts and sciences are encouraged to combine the pre-veterinary requirements with a degree-granting major of their choice. Students should consult the pre-veterinary advisor in the College of Arts and Sciences dean's office.

The pre-veterinary requirements may be completed in the College of Agriculture if a student's major is in that college.

Pre-pharmacy

The admission committee of the Pharmacy School of the University of Kansas gives a preference to applicants who are Kansas residents. The following courses constitute their requirements and fulfill most of the requirements of the other U.S. pharmacy schools.

| | | |
|----------|--|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 531 | Organic Chemistry I | 3 |
| CHM 532 | Organic Chemistry Laboratory | 2 |
| CHM 550 | Organic Chemistry II | 3 |
| CHM 551 | Advanced Organic Chemistry Laboratory | 2 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Structure and Function of the Human Body | 6 |
| BIOL 455 | General Microbiology | 4 |
| PHYS 115 | Descriptive Physics* | 4 |
| | or | |
| PHYS 101 | The Physical World I | 3 |
| | and | |
| PHYS 103 | The Physical World I Laboratory | 1 |
| SPCH 106 | Public Speaking I | 3 |

Humanities and social sciences electives 9

*Students who have completed high school physics with a grade of B or better may be exempt.

Additional information may be obtained in the office of the dean of the College of Arts and Sciences.

Pre-law

While the Association of American Law Schools does not specify a particular pre-law curriculum, it does emphasize the selection of rigorous courses that will enable students to achieve comprehension and expression in words; critical understanding of the human institutions and values with which the law deals; and creative power in thinking. The development of these capacities is a highly individualized process vigorously pursued in a variety of disciplines and degrees. Students in all majors who are considering law study should consult with the K-State pre-law advisor in the office of the dean of arts and sciences as early as possible in their undergraduate careers.

Pre-nursing

Students entering the pre-nursing curriculum take the necessary courses and electives for transferring to a school of nursing. The number of credits earned and the courses taken will vary depending on the school of nursing the student desires to attend. For students entering a baccalaureate degree program in nursing, generally two years of course work (60-65 credit hours), as prescribed by the university granting the degree, are required. The pre-nursing advisor in the office of the dean of arts and sciences will assist students in selecting appropriate courses, advising them regarding the different kinds of nursing education and in processing applications.

| | | |
|-----------|---|-----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 106 | Public Speaking I | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| PSYCH 110 | General Psychology | 3 |
| CHM 110 | General Chemistry and Lab | 5 |
| BIOL 198 | Principles of Biology and Lab | 4 |
| MATH 100 | College Algebra | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| BIOL 455 | General Microbiology | 4 |
| BIOL 240 | Structure and Function of the Human Body | 6 |
| PSYCH 520 | Life Span Personality Development | 3 |
| FN 132 | Basic Nutrition | 3 |
| ANTH 200 | Cultural Anthropology | 3 |
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |
| | Philosophy or ethics | 3 |
| | Humanities electives | 3-6 |

For the licensed practical nurses and registered nurses special advising is available in selecting appropriate classes. This assistance is provided by the pre-nursing advisor in the dean's office of the College of Arts and Sciences.

Pre-physical therapy

To be eligible for the state's two physical therapy degree programs, which are located at the University of Kansas and Wichita State University, students should complete an undergraduate degree including the following classes. There are a few additional requirements for Wichita State University. Both programs grant the master's degree in physical therapy. Some students may wish to apply to out-of-state physical therapy programs.

| | | |
|-----------|---|-------|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 106 | Public Speaking I | 3 |
| PSYCH 110 | General Psychology | 3 |
| PSYCH 505 | Abnormal Psychology | 3 |
| PSYCH 520 | Life Span Personality Development | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| | Humanities (history, art history, music literature, philosophy, literature) | 12-15 |
| MATH 100 | College Algebra | 3 |
| | and | |
| MATH 150 | Plane Trigonometry | 3 |
| | Statistics | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Structure and Function of the Human Body | 6 |
| BIOL 455 | General Microbiology | 4 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| PE 376 | Standard First Aid | 1 |

Any student interested in this program should consult with the pre-physical therapy advisor in the dean's office of the College of Arts and Sciences for details.

Pre-dental hygiene

Students interested in dental hygiene careers can gain the knowledge and competence needed for clinical study in a two-year course of study. Most students who do their first two years at KSU attend programs at either the University of Missouri-Kansas City School of Dentistry or Wichita State University. The following courses are required of students applying for admission to these programs.

| | | |
|-----------|--|----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 106 | Public Speaking I | 3 |
| | Humanities electives | 9 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| | Behavioral or social science elective | 6 |
| MATH 100 | College Algebra | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Structure and Function of the Human Body | 6 |
| CHM 110 | General Chemistry | 5 |
| | Electives | 12 |

Pre-occupational therapy

To be eligible for admission to the occupational therapy program at the University of Kansas Medical Center the following course work needs to be completed:

| | | |
|-----------|---------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| | Literature | 3 |
| SPCH 106 | Public Speaking I | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| PSYCH 110 | General Psychology | 3 |

| | | |
|-------------------------------------|--|----|
| Psychology course (consult advisor) | 3 | |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Structure and Function of the Human Body | 6 |
| MATH 100 | College Algebra | 3 |
| | Basic media courses* | 3 |
| | Social science—humanities elective | 3 |
| | General electives | 11 |
| | | 51 |

*Included: tangible art/craft classes (metal and jewelry, design I, drawing I, sculpture, weaving, ceramics, painting, etc.)

Any student interested in this program should consult with the pre-occupational therapy advisor in the dean's office in the College of Arts and Sciences for details.

Pre-respiratory therapy

Advising is available for two years of preparatory work for application to respiratory therapy programs. The following classes should be taken:

| | | |
|----------|------------------------------------|-------|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| ENGL 516 | Written Communication for Sciences | 3 |
| SPCH 106 | Public Speaking | 3 |
| MATH 100 | College Algebra | 3 |
| CHM 110 | General Chemistry | 5 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Human Body | 6 |
| BIOL 455 | General Microbiology | 4 |
| PHYS 115 | Descriptive Physics | 4 |
| | Social science electives | 3 |
| | Humanities electives | 3 |
| PE 376 | First Aid-Standard CPR | 1 |
| | Math and science electives | 6-10 |
| | Electives | 12 |
| | | 62-66 |

Any student interested in this program should consult with the pre-respiratory therapy advisor in the dean's office of the College of Arts and Sciences for details.

Pre-medical records administration

The pre-medical records administration curriculum is a three-year program. Qualified applicants then apply to the Medical Records Administration program at the University of Kansas. The following course work needs to be completed:

| | | |
|-----------|---|----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| ENGL 516 | Written Communication for Sciences | 3 |
| SPCH 106 | Public Speaking | 3 |
| MATH 100 | College Algebra | 3 |
| STAT 320 | Elements of Statistics | 3 |
| | or | |
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |
| | or | |
| STAT 350 | Business and Economic Statistics I | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 111 | Introduction to Sociology | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Structures and Function of the Human Body | 6 |
| MANGT 420 | Management Concepts | 3 |
| MANGT 531 | Personnel and Human Resource Management | 3 |
| MANGT 390 | Business Law | 3 |
| CIS 110 | Introduction to Personal Computing | 3 |
| | Humanities electives | 6 |
| | Social science electives | 3 |
| | Life science electives | 6 |
| | Electives | 19 |
| | | 80 |

Any student interested in this program should consult with the pre-medical records administration advisor in the dean's office of the College of Arts and Sciences for details.

For more specific information about any of these health care professions, designate which profession(s) you are interested in and address your questions to:

Office of the Dean
College of Arts and Sciences
113 Eisenhower
Kansas State University
Manhattan, KS 66506-1105

Aerospace Studies

John B. McTasney, Head

Assistant Professors Taglieri, Everett, and Royer.

108 Military Science Hall
532-6600

The Air Force Reserve Officer Training Corps (AFROTC) provides the best means for undergraduate and graduate students to become officers in the United States Air Force. Upon completion of the University program, students are commissioned second lieutenants, and then:

Enter active duty as a pilot, missileer, or navigator, or enter a technical or nontechnical career field, or

Are deferred for graduate study, to enter active service after degree completion, or

Enter into Air Force-sponsored graduate study at full pay while serving as Air Force officers.

Any student—graduate or undergraduate—who is a U.S. citizen may become a cadet by enrolling in AERO 110. The duration of the program varies from two to four years, depending upon an applicant's previous experience and the availability of different options.

Scholarships

There is a wide range of scholarships available depending on college major, academic standing, and projected career choices. Full-time students who qualify to become Air Force officers, with two or more years left for degree completion (including graduate study), are eligible to apply. If selected, students will have their tuition, fees, and book expenses paid for by the U.S. Air Force; they will also receive a \$100 monthly stipend while in school. All payments are tax free.

Students who apply for and receive the Air Force Pre-Health Professions Scholarship, and are subsequently accepted to medical school, are guaranteed scholarship through medical school. The Pre-Health Professions

Scholarship pays for tuition, fees, and books, plus \$100 monthly. The medical school scholarship pays med-school tuition, fees, books, and more than \$600 per month.

High school students considering application for the four-year Air Force College Scholarship Program must be highly motivated toward becoming Air Force officers. To qualify, students should be above-average scholars, be physically capable, possess leadership potential, and make application before December of the senior year. Financial benefits are the same as the earlier mentioned undergraduate scholarships. Applicants should contact their high school counselor or an AFROTC officer for applications and further information.

Undergraduate and graduate study

Four-year program

Basic course

Students electing the four-year program normally will begin with the General Military Course (GMC) during the freshman or sophomore year. This program consists of four semesters of 1 credit hour each, counts toward all bachelor's degrees awarded by KSU, and in no way obligates students to a military commitment. Aerospace studies GMC courses are open to all students at the University without obligation to military service. Students in the GMC are provided uniforms, texts, and other equipment needed for their AFROTC courses. Students may begin enrollment in GMC courses at any time until two years prior to graduation (graduate or undergraduate).

Advanced course

The Professional Officer Course (POC) is the upperclass program and consists of four courses of 3 credit hours each, over a period of four semesters. All cadets in the POC become members of the Air Force Reserve and receive \$100 a month and all necessary AFROTC texts and equipment. Upon completion of the POC and their degree requirements, students are commissioned as second lieutenants in the United States Air Force.

Two-year program

The two-year program consists of the POC phase only and may be taken during a student's final four semesters, undergraduate or graduate, at the University.

Prerequisites for selection include Air Force aptitude testing, an Air Force physical, and completion of six weeks of summer field training. Applicants should contact AFROTC earlier than 15 February.

Field training

Cadets practice their leadership and management skills in a cadet group. Those cadets who are in the four-year program attend four weeks of field training at an Air

Force base during the summer prior to entering the POC. Two-year program cadets attend six weeks of field training. During training, the cadet is paid approximately \$115 per week, and receives travel pay to and from the training base.

Extracurricular activities

Students enrolled in Air Force ROTC may participate in many activities including detachment-sponsored events and social functions. Cadets pursuing officers' commissions are eligible for membership in the Arnold Air Society, a national honorary professional and service organization established to foster good relations among Air Force ROTC, the Air Force, the campus, and the local community. Participation in the Arnold Air Society is voluntary.

AFROTC Supplemental Courses Program

The Supplemental Courses Program (SCP) provides both required and recommended courses designed to enhance the career and officer performance of persons commissioned through AFROTC.

GMC scholarship cadets must successfully complete a course in English composition by the end of the sophomore year. They are also encouraged to take a course in speech.

POC cadets must successfully complete a course in mathematical reasoning prior to commissioning.

In all cases, successful completion of a KSU required course in a supplemental subject area will also satisfy the AFROTC requirement. Details on the SCP are available through the Department of Aerospace Studies.

Foreign language requirement

AFROTC cadets who accept scholarships are required to successfully complete at least two semesters of college instruction in a major Indo-European or Asian language prior to commissioning. AFROTC policy is to allow cadets to meet the requirement by completing a course or by demonstrating proficiency as certified by the Department of Modern Languages.

General military courses

Undergraduate credit

AERO 099. Aerospace Studies Lab. (0) I, II. The leadership laboratory for aerospace studies. Students will receive leadership training and experience as well as training in Air Force customs and courtesies. Pr.: Instructor permission. AERO-099-0-1803

AERO 110. Aerospace Studies 1A. (1) I. A study of the mission and organization of the United States Air Force; U.S. general purpose and aerospace support forces. One hour of class plus one hour of leadership training a week. AERO-110-0-1803

AERO 111. Aerospace Studies 1B. (1) II. U.S. strategic offensive and defensive forces; their mission, function, and employment. One hour of class plus one hour of leadership training a week. AERO-111-0-1803

AERO 210. Aerospace Studies 2A. (1) I. The development of air power from its beginnings to the end of World War II. It traces the development of various concepts of employment of air power. One hour of class plus one hour of leadership training a week. AERO-210-0-1803

AERO 211. Aerospace Studies 2B. (1) II. The development of air power from the close of World War II to the present. It focuses upon factors which have prompted research and technological change and stresses significant examples of the impact of air power on strategic thought. One hour of class plus one hour of leadership training a week. AERO-211-0-1803

AERO 215. AFROTC Summer Program. (4) S. Mission and organization of United States Air Force, including function and employment; development of air power from its beginning to the present. Emphasis on factors prompting research and technological change and impact of air power on strategic issues. Taught off campus at selected Air Force bases. Pr.: Open only to students entering AFROTC program at the junior level. AERO-215-0-1803

Professional officers courses

Undergraduate credit

AERO 310. The Professional Officer 3A. (3) I. A study of USAF professionalism, leadership, and management. Includes the meaning of professionalism, professional responsibilities, the military justice system, leadership theory, functions and practices, management principles and functions, problem solving, and management tools, practices, and controls. Three hours of class plus one hour of leadership training a week. AERO-310-0-1803

AERO 311. The Professional Officer 3B. (3) II. Continuation of AERO 310. Three hours of class plus one hour of leadership training a week. AERO-311-0-1803

AERO 399. Problem in Aerospace Studies. (Var.) I, II. Work offered in any of the AFROTC general or professional courses for students out of phase for graduation; material covered in a basic or advanced course. Pr.: Consent of department head. AERO-399-3-1803

AERO 410. Aerospace Studies 4A. (3) I. This course will examine the role of the professional officer in a democratic society; socialization processes within the armed services; the requisites for maintaining adequate national security forces; political, economic, and social constraints upon the overall defense policy-making process. Three hours a week. AERO-410-0-1803

AERO 411. Aerospace Studies 4B. (3) II. Focusing on the armed forces as an integral element of society, this course provides an examination of the broad range of American civil-military relations and the environmental context in which defense policy is formulated. Communicative skills are stressed. The role of contemporary aerospace power, and current and future employment of aerospace forces will also be examined. Three hours of class plus one hour of leadership training a week. AERO-411-0-1803

AERO 490. Briefing for Air Force Commissioned Service. (1) I, II. Ordinarily taken by POC cadets during their last semester of officer training. Provides specific understanding of processes and procedures incident to entering active duty as an officer in the USAF. AERO-490-3-1803

AERO 491. Introduction to Flight Training. (1) II. Basic aerodynamics, aviation weather, navigation, flight/mission planning, and introduction to undergraduate pilot/navigator training. Normally taken by senior professional officer course students. Pr.: Consent of instructor. AERO-491-1-1803

Anthropology

Martin Ottenheimer,* Head

Professors Finnegan,* O'Brien,* H. Ottenheimer,* and M. Ottenheimer;* Associate Professor Benson;* Adjunct Professor Michie; Emeritus Professor Taylor.*

Anthropology is a major within the Department of Sociology, Anthropology, and Social Work, listed alphabetically in the College of Arts and Sciences.

There are four major subfields of anthropology. Physical anthropology explores the origins of human life and the biological bases of culture. Archaeology examines the development of human cultures from prehistory and ancient civilizations to historic and modern times. Linguistic anthropology focuses on the languages and dialects of the world and the relationships of language to thought and culture. Cultural anthropology studies human behavior by surveying the range and variety of cultural traditions throughout the world. Some anthropology majors generalize, while others specialize in one or more of the subfields.

In addition to the general B.A. or B.S. requirements, anthropology majors take a minimum of 27 hours in anthropology as follows:

| | |
|--------------------------------------|---|
| Introductions to the four subfields: | |
| ANTH 200 | Introduction to Cultural Anthropology 3 |
| ANTH 220 | Introduction to Linguistic Anthropology 3 |
| ANTH 260 | Introduction to Archaeology 3 |
| ANTH 280 | Introduction to Physical Anthropology 3 |
| Capstone course: | |
| ANTH 602 | Anthropological Theory 3 |

Four advanced electives distributed among at least two of the subfields: 12 hours at or above the 500 level.

Many anthropology students prepare for the variety of occupations concerned with human relations by combining anthropological study with other training, frequently by majoring in two fields. Each program of study is worked out individually by a student and his or her advisor. Interested students may obtain additional information from the *Handbook on Majoring in Anthropology*, which is available in the department office.

Applied anthropology option

The applied anthropology option provides preparation and experience in the application of anthropology to professional settings outside the academic environment. The option is interdisciplinary, combining anthropology with other areas of training and expertise. While the option is flexible and accommodates a wide range of individual student interests, emphasis is on three major areas: developmental/action anthropology (domestic, international,

community, and rural development); cultural resource management (historic preservation, parks and museums, and public archaeology); and complex organizations (agencies, foundations, business, administration, planning, and policy analysis).

The option builds on existing requirements for a bachelor's baccalaureate degree in anthropology. It adds 6 hours in anthropology and 18 hours in an area specialization outside the anthropology major. Double major, dual degree, pre-professional and secondary major programs are particularly well suited for the option. Application to participate is normally made to the anthropology faculty during or before the junior year.

In addition to the existing 27 hours of major requirements for the bachelor's degree in anthropology, the following courses are required:

| | | |
|----------|---|---|
| ANTH 640 | Pro-Seminar in Applied Anthropology | 3 |
| ANTH 641 | Internship in Applied Anthropology | 3 |
| | or | |
| ANTH 626 | Internship in Museology | 3 |

An area specialization consisting of 18 hours of course work outside anthropology with the following distribution:

| | |
|---|----|
| Quantitative or technical skill development | 6 |
| Subject matter courses | 12 |

The area specialization is a set of related courses focused on a particular interest, problem domain, or area of expertise taken from any other discipline or combination of disciplines. The quantitative and technical skill courses must be consistent with and supportive of the subject matter work. Students must demonstrate the coherence of their chosen area specialization and its fit with anthropology. The area specialization must be approved by the anthropology faculty.

Courses in anthropology Undergraduate credit

ANTH 200. Introduction to Cultural Anthropology. (3) I, II S. Introduction to ethnology and ethnography; analysis and comparison of technological, social, and religious characteristics of cultural systems. ANTH-200-0-2202

ANTH 201. Introduction to Cultural Anthropology, Honors. (4) On sufficient demand. Introduction to basic ethnology and ethnography; technological, social, and religious characteristics of cultural systems; discussion and independent study. ANTH-201-0-2202

ANTH 202. Anthropology Seminar for Education Majors. (1) I, II. To aid elementary and secondary education majors in relating anthropological perspectives and findings to their teaching areas. Pr.: ANTH 200 or conc. enrollment. ANTH-202-0-2202

ANTH 220. Introduction to Linguistic Anthropology. (3) II. Language as a part of human behavior: its origins, uses and abuses, and ways of defining reality. Basic descriptive and ethnosemantic skills used by anthropologists to learn languages in the field. ANTH-220-0-2202

ANTH 260. Introduction to Archaeology. (3) I, II. A brief survey of theories of culture change as they apply to the development of Stone Age cultures through the rise of worldwide agricultural societies, cities, and other complex societies; brief outlines of the major Old and New World cultural sequences. ANTH-260-0-2202

ANTH 280. Introduction to Physical Anthropology. (3) I, II, S. History of research; principles of evolution and human genetics; primate relations of hominids; fossil evidence of the evolution of hominids; the study of modern race; culture and evolution. ANTH-280-0-2202

ANTH 281. Introduction to Physical Anthropology Laboratory. (1) I, II, S. Laboratory investigation of human skeletal anatomy, human genetics, primate comparative anatomy, fossil hominid morphology, and comparative evolution of hominid types. Two hours lab a week. Pr.: ANTH 280 or conc. enrollment. ANTH-281-1-2202

ANTH 399. Honors Seminar in Anthropology. (1-3) On sufficient demand. Readings and discussion of selected topics. Open to nonmajors in the honors program. ANTH-399-3-4900

ANTH 420. Ethnography of Language. (3) I or II. Study of language and dialect as aspects of social and ethnic group identities. Participant observation is emphasized. Research project includes kinship terminology, life histories, folklore, and lexicography. Pr.: ANTH 200 or consent of instructor. ANTH-420-0-2202

ANTH 499. Senior Honors Thesis. (2) On sufficient demand. Open only to seniors in the arts and sciences honors program. ANTH-499-4-2202

Undergraduate and graduate credit in minor field

ANTH 501. Proficiency Development. (1-3) I, II. Integrative review of anthropological concepts and skills under faculty supervision. For single students or groups of students. Not applicable to major field requirements. Not repeatable. For undergraduate credit only. Pr.: Consent of instructor and superior performance in relevant course. ANTH-501-0-2202

ANTH 505. Introduction to the Civilizations of South Asia I. (3) I. Interdisciplinary survey of the development of civilizations in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan; geographical and demographic context; philosophical and social concepts; social and political institutions; literature and historical movements. Pr.: ANTH 200. Same as HIST 505, ECON 505, POLSC 505, SOCIO 505. ANTH-505-0-2202

ANTH 506. Introduction to the Civilizations of South Asia II. (3) II. Interdisciplinary survey of recent and contemporary civilizations in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including recent history, current economy, religion, culture, languages, literature, geography, social and political structure, ideas. Pr.: ANTH 200. Same as HIST 506, ECON 506, POLSC 506, SOCIO 506. ANTH-506-0-2202

ANTH 507. Folk Cultures. (3) I or II. A comparative approach to agrarian societies; the investigation of economic, political, social, and ideological aspects of peasantry. Pr.: Sophomore standing. ANTH-507-0-2202

ANTH 508. Male and Female: Cross-Cultural Perspectives. (3) I or II. Sex roles and male-female relationships in the world's cultures. Stresses sex-role complementarity within the anthropological framework of cultural relativism. Pr.: Sophomore standing. ANTH-508-0-2202

ANTH 510. Kinship and Marriage in Cross-Cultural Perspective. (3) II, in even years. Systems of family, marriage, descent, and sex tabus in cross-cultural perspective. Pr.: ANTH 200 or SOCIO 211. ANTH-510-0-2202

ANTH 511. Cultural Ecology and Economy. (3) I or II. Cultural ecology and organization in the world's cultures. Discussion of environment and culture, exchange and display, money, trade and markets, and economic development and social change in selected societies. Pr.: Sophomore standing. ANTH-511-0-2202

ANTH 512. Political Anthropology. (3) I or II. Ethnological approaches to politics in societies around the world. Structural-functional, evolutionary, and conflict theories. A comparison of the political systems

of small-scale and complex societies: political modernization. Pr.: Sophomore standing. ANTH-512-0-2202

ANTH 515. Creativity and Culture. (3) I, in even years. How ethnologists view the expressive and creative aspects of culture. A cross-cultural survey of the verbal, visual, and performing arts. Pr.: Sophomore standing. ANTH-515-0-2202

ANTH 516. Ethnomusicology. (3) I. Ethnic, popular, and traditional musics from around the world. The course samples a wide range of stylistic traditions from Africa, Asia, Oceania, Europe, and the Americas. Emphasis is on understanding musical style in cultural context. ANTH-516-0-2202

ANTH 517. African American Music and Culture. (3) I, in odd years. Continuity and tradition in the musical styles and cultural patterns of African Americans in the United States, the Caribbean, and South America. Music, art, religion, social organization, from African roots to modern forms. ANTH-517-0-2202

ANTH 519. Practical Anthropology. (3) I or II. Application of anthropological principles and insights to programs of planned change, cultural innovation, and contemporary problems. Pr.: Sophomore standing. ANTH-519-0-2202

ANTH 520. Senior Seminar. (3) On sufficient demand. Intensive exploration of anthropological problems for both majors and nonmajors of sufficient background. High levels of individual participation. Pr.: Senior standing and 9 hours of anthropology, or consent of instructor. ANTH-520-0-2202

ANTH 522. Special Topics in Anthropology. (1-4) On sufficient demand. Variable topics within cultural anthropology, linguistic anthropology, archaeology, or physical anthropology. Pr.: Consent of instructor. ANTH-522-3-2202

ANTH 532. Mexican and Central American Indians. (3) I or II. Description and comparison of Tarahumara, Aztec, Maya, Cuna, and other cultures of Mexico, Central America, and the Caribbean ring. Culture contact and change in surviving tribes. ANTH-532-0-2202

ANTH 533. Indians of Kansas. (3) I, in even years. Description and comparison of native cultures of the prairies and plains of Kansas. Culture contact and change in surviving tribes. Pr.: Sophomore standing. ANTH-533-0-2202

ANTH 536. African American Cultures. (3) I or II. Description and comparison of African-derived cultural patterns in the Americas, stressing culture contact and acculturation, retention and syncretism, social and economic organization, religion, language, the arts. Pr.: Sophomore standing. ANTH-536-0-2202

ANTH 545. Cultures of India and Pakistan. (3) I or II. Cultural survey of the contemporary tribes and Hindu caste communities in their historical and geographical context, followed by a more intense analysis of selected Indian and Pakistani village case studies stressing indigenous economic, social, political, and religious structures. Pr.: Sophomore standing. ANTH-545-0-2202

ANTH 550. Cultures of Africa. (3) I or II. Family life, subsistence patterns, exchange systems, languages, religions, and development of the peoples of Africa. ANTH-550-0-2202

ANTH 570. American Indian Archaeology. (3) I or II. Peopling of the New World; the Archaic period; spread of agriculture; prehistoric village community life. Specific cultural sequences of the U.S. and Arctic. Pr.: ANTH 200 or 260. ANTH-570-0-2202

Undergraduate and graduate credit

ANTH 600. Cultural Dynamics. (3) I or II. Cultural processes and their conditions and consequences; mechanisms by which customs originate and become culturally significant; development, modification, and decline of customs and cultures; processes and consequences of intercultural contact; applied anthropology. Pr.: ANTH 200 or consent of instructor. ANTH-600-0-2202

ANTH 602. Anthropological Theory. (3) I or II. Review and integration of the major theoretical approaches in the principal branches of anthropology. Pr.: ANTH 200 or consent of instructor. ANTH-602-0-2202

ANTH 604. Culture and Personality. (3) I or II. Anthropological contributions to personality study; cross-cultural comparisons of personality types, means of personality formation in different cultures; cultural change and personality. Pr.: Three hours of anthropology. ANTH-604-0-2202

ANTH 618. Religion in Culture. (3) II, in odd years. The nature of religion in different cultural systems. Pr.: ANTH 200 or SOCIO 211 or consent of instructor. Same as SOCIO 618. ANTH-618-0-2202

ANTH 625. Independent Reading and Research in Anthropology. (1-3) I, II. Guided reading and research on a specific anthropological topic of student interest, leading to preparation of a research paper. Topic and credit to be arranged. Pr.: Three hours of anthropology and consent of instructor. ANTH-625-3-2202

ANTH 626. Internship in Museology. (3) I, II, S. Practical professional museum experience of at least three weeks full time or 135 hours part time in the processing of collections, conservation, cataloging, archive and library maintenance, and/or the planning and preparation of exhibits. May be repeated once for credit if at a different type of museum. Pr.: ANTH 200 or 260. ANTH-626-0-2202.

ANTH 630. Indians of North America. (3) I, in odd years. Description and comparison of native cultures of Canada and the United States; culture contact and change among surviving groups. Pr.: ANTH 200 or 260. ANTH-630-0-2202

ANTH 633. Gender, Power, and International Development. (3) II, in even years. Examination of various models of development and their impact on roles of women and men in various cultures. Emphasis upon Africa, Asia, and Latin America. Comparisons of public, service, and economic sectors, including agriculture, marketing, and industry. Examination of policy issues. Pr.: SOCIO 211 or ANTH 200 and 3 additional hours in sociology or cultural anthropology. Same as SOCIO 633. ANTH-633-0-2202

ANTH 634. Indian Cultures of South America. (3) On sufficient demand. A survey of the nature and variability of the original cultures of South America. Analysis of sample cultures, stressing economic, social, political, and religious structures. Pr.: ANTH 200 or 260. ANTH-634-0-2202

ANTH 640. Pro-seminar in Applied Anthropology. (3) I. Study and analysis in selected subfields of the discipline related to professional experience and problem solving outside the academic discipline. Critical emphasis is on analytical and evaluative skills in relation to the organization and objectives of groups, agencies, and institutions for which applied work is conducted. Only fulfills option requirements for anthropology majors. Pr.: Consent of instructor. ANTH-640-0-2202

ANTH 641. Internship in Applied Anthropology. (3) I, II, S. Supervised field experience of at least three weeks full time or 135 hours part time with an organization or institution in the application of anthropological approaches to problem solving and working in a professional setting. Emphasis is on anthropological skills in relation to the objectives and operations of an institution. Only fulfills option requirements for anthropology majors. May be repeated once for credit. Pr.: Completion of all other option requirements and consent of the instructor. ANTH-641-0-2202

ANTH 673. Precolumbian Civilizations of Mexico and Guatemala. (3) I or II. Early foraging societies, the beginnings of agriculture; the rise of civilization; the classic empires of the Maya, Aztec, Tarascans, and their neighbors; relationships with the southeastern and southwestern United States. Pr.: ANTH 200 or 260. ANTH-673-0-2202

ANTH 676. Archaeology of the Old World. (3) I or II. Origin and evolution of human culture and technology with a particular focus on the cultural developments in China, India, sub-Saharan Africa, and Polynesia as well as the Bronze and Iron Ages of Europe and the early Mediterranean civilizations. Pr.: ANTH 200, 260, or consent of instructor. ANTH-676-0-2202

ANTH 679. Archaeological Field Methods. (3) I. Archaeological site survey, site excavation, and laboratory analysis of sites and artifacts from the Manhattan, Kansas region. Field work on Saturday, 8 a.m.-5 p.m., while weather permits, laboratory work thereafter. Pr.: Consent of instructor. ANTH-679-1-2202

ANTH 680. Survey of Forensic Sciences. (3) Anthropological survey of the predominantly biological areas of forensic science, their methods and techniques, as they pertain to the application of that science to the purpose of the law. Particular emphasis will be given to perspectives about the science itself, its application to anthropology, and the unique ways in which that science may be used by the law. Pr.: A life science with laboratory requirement in the College of Arts and Sciences or consent of the instructor. ANTH-680-0-2202

ANTH 685. Race and Culture. (3) I, in odd years. The biological meaning of race; the interrelationships of biological and cultural traits in human evolution; processes of racial formation of man; methods of classifying human races; cultural inheritance; the distinction of race, culture, personality, and intelligence; a review of modern racism; race as an evolutionary episode. ANTH-685-0-2202

ANTH 688. Paleoanthropology. (3) II, in odd years. Human origins and evolution as indicated by fossil evidence; interpretation of man-apes, Pithecanthropus, Neanderthal, Cro-Magnon, and other major fossil groups within the context of evolutionary theory, primate comparisons, and cultural evolution. Pr.: ANTH 200 or 280 or consent of instructor. ANTH-688-0-2202

ANTH 691. Primatology. (3) I, in even years. Survey of the primate order including considerations of evolution, morphology, and behavior. Particular emphasis will be given to developing perspectives about the origin and evolution of hominids in the context of the primate order. Pr.: ANTH 280 or consent of instructor. ANTH-691-0-2202

ANTH 694. Osteology. (3) II, in even years. Detailed study of human skeleton, with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations. Pr.: ANTH 280 or consent of instructor. ANTH-694-0-2202

ANTH 695. Laboratory in Osteology. II, in even years. Laboratory demonstration and exercise in working with skeletal material for analysis of sex, age, stature, and race. Complete metric and nonmetric analysis with consideration given to paleodemography, paleopathology, *in situ* analysis and excavation, and preservation. Written reports on bone material remains will be necessary. Pr.: ANTH 694 or conc. enrollment and consent of instructor. ANTH-695-1-2202

ANTH 730. Field and Laboratory Techniques in Archaeology. (1-9) S. Participation in archaeological excavations; techniques, methods, and procedures in a field research situation. The laboratory work of cleaning, cataloging, analyzing, and preliminary report preparation of materials recovered. May be repeated once if the areas or problems involved are different. Pr.: ANTH 200 or 260 or consent of instructor. ANTH-730-1-2202

ANTH 736. Applied Agricultural and Rural Change. (3) I, in even years. Examination of agricultural and rural development projects and programs and how they fit into national and regional social and cultural systems. Emphasis on locally and regionally based development strategies. Examination of the role of international agencies in understanding shifts in dominant approaches to applied rural change.

Pr.: SOCIO 211 or ANTH 200. Same as SOCIO 736. ANTH-736-0-2202

ANTH 792. Field Methods in Linguistics. (3) On sufficient demand. Techniques of collecting and analyzing linguistic data in the field. Work with language consultants in class, on languages such as Swahili. Pr.: ANTH 220 or LING 280 or 600. Same as LING 792 and LG 792. ANTH-792-0-2202

Art

Gary Woodward,* Head

Professors Garzio,* Ikeda,* Pujol,* and Stroh;* Associate Professors Clore, Culley,* Harmes, Kren,* Munce,* Noblett,* Rex Replogle,* Sturr,* Woodward,* and Vogt;* Assistant Professors Dollar, Love,* Ogg, O'Shea,* Renata Replogle, Routson,* Schmidt,* Swiler,* and Winegardner; Instructor Hagan; Emeriti: Professor Larmer,* Associate Professor Hill.

Undergraduate study Bachelor of arts

The B.A. degree in art consists of three parts: the general education as outlined under the humanities curriculum; a core of beginning art courses to provide prerequisites and a broad range of art experience for the art major; and 16 hours concentration of related subjects which should provide a minimal basis for establishing professional competence. Concentration possibilities will be in one of the following: painting, printmaking, ceramics, sculpture, drawing, art history, metalsmithing and jewelry, or graphic design. The bachelor of arts degree requires a minimum of 48 semester hours in art. The major requirements are as follows:

| | |
|------------------------|--|
| Art history (12 hours) | |
| ART 195 | Survey of Art History I 3 |
| ART 196 | Survey of Art History II 3 |
| ART 545 | Twentieth Century Art History I . . . 3 |
| ART 550 | Twentieth Century Art History II . . . 3 |
| *ART 100 | Design I 2 |
| *ART 200 | Design II 2 |
| *ART 190 | Drawing I 2 |
| *ART 210 | Drawing II 2 |
| ART 225 | Figure Drawing I 2 |
| *ART 230 | Sculpture I 2 |
| *ART 245 | Painting I 2 |
| *ART 235 | Printmaking I 2 |
| *ART 220 | Water Color I 2 |
| *ART 265 | Ceramics I 2 |
| Major concentration | 16 |

Bachelor of fine arts

The bachelor of fine arts degree is the more professionally oriented undergraduate degree in art. It is designed primarily for those planning to become professional artists, artist-teachers, or art therapists. Greater emphasis is placed on actual practice in the creative art disciplines. The degree is considered the appropriate preparation for the master of fine arts degree, which is recognized as the terminal degree in studio arts, and for the master of

arts in art therapy, which is required for certification as an art therapist. The B.F.A. in art is a four-year, 120-hour program with concentrations possible in painting, sculpture, ceramics, graphic design, printmaking, drawing, metalsmithing and jewelry, and pre-art therapy. The major requirements are as follows:

| | |
|-----------------------------------|--|
| Art history (15 hours) | |
| ART 195 | Survey of Art History I 3 |
| ART 196 | Survey of Art History II 3 |
| ART 545 | Twentieth Century Art History I . . . 3 |
| ART 550 | Twentieth Century Art History II . . . 3 |
| Art history electives 3 | |
| *ART 100 | Design I 2 |
| *ART 200 | Design II 2 |
| Drawing (8 hours) | |
| *ART 190 | Drawing I 2 |
| *ART 210 | Drawing II 2 |
| Drawing electives 4 | |
| ART 225 | Figure Drawing I 2 |
| *ART 245 | Painting I 2 |
| *ART 230 | Sculpture I 2 |
| *ART 265 | Ceramics I 2 |
| *ART 235 | Printmaking I 2 |
| *ART 270 | Metalsmithing and Jewelry 2 |
| ART 410 | B.F.A. Exhibition 0 |
| Major concentration | 20 |
| Art electives | 16 |
| | 75 |

*Courses to be completed before declaration of a major area of concentration.

Art education

Students may satisfy requirements to teach art in public schools by any of three programs: B.A. and teacher certification; B.F.A. and teacher certification; or B.S. in education with art concentration. Under the first two options students qualify for teacher certification by completion of specified courses in the College of Education. See the College of Education approved programs section for more information.

Studios, laboratories, and equipment for creative work are provided and adequate to the needs of the art areas. Student work may be retained at the discretion of the faculty for an indefinite period of time for instructional and exhibition purposes.

Pre-art therapy

Preparation for graduate work leading to certification as an art therapist may be done as one concentration in the regular B.F.A. program. The pre-art therapy concentration is the B.F.A. degree with the major concentration (20 credit hours) and the art electives (16 credit hours) selected from a group of specific courses in psychology and art rather than a particular study concentration.

Transfer students

Art hours transferred to KSU will be assigned by the art department. Students may use transfer hours toward their area of concentration only when obtained from a four-year college or university.

Graduate study

Work leading to the master of fine arts is offered in the Department of Art in drawing, painting, printmaking, sculpture, ceramics, and metalsmithing and jewelry.

Candidates for graduate work should have completed an undergraduate curriculum with a broad background in art. Students lacking preparation in certain areas may be asked to do additional work. Other requirements for the master of fine arts degree include a minimum of 60 semester hours, approximately two-thirds of which will be in the field of concentration. The candidate is also required to complete two graduate seminars and supporting courses in the study of art history.

The candidate will take an oral examination based in part on the academic thesis submitted. The studio project for the thesis will consist of a significant creative effort in the candidate's chosen major medium, which must be publicly exhibited, and a written document providing an analysis of that work.

Courses in art

ART 095. Art Assembly. (0) I, II. Recommended for all art and art education majors each semester. By appt. ART-095-2-0831

Undergraduate credit

ART 100. Design I. (2) I, II. Introduction to and laboratory practice in the principles and elements of design. Four hours lab. ART-100-1-1002

ART 190. Drawing I. (2) I, II. Fundamentals of drawing as applied to the realistic and expressive representation of objects through the use of a variety of media and approaches. Four hour lab. ART-190-1-0-1002

ART 195. Survey of Art History I. (3) I. Historical development of art from pre-history through the Middle Ages. ART-195-0-1003

ART 196. Survey of Art History II. (3) II. Historical development of art from the Renaissance to the nineteenth century. ART-196-0-1003

ART 200. Design II. (2) I, II. Further work in the principles and elements of design, with emphasis on color, texture, and pictorial composition. Four hours lab. Pr.: ART 100. ART-200-1-0-1002

ART 205. Graphic Design Techniques. (2) I, II. Layout and drawing techniques and tools used in various media related to reproducing art for commercial reproduction purposes. Four hours lab. Pr.: ART 100, 190. ART-205-1-0-1002

ART 210. Drawing II. (2) I, II. Continuation of Drawing I, with strong emphasis on creative expression. Four hours lab. Pr.: ART 100, 190. ART-210-1-0-1002

ART 215. Design III. (2) I, II. Work in three dimensions in sheet metal, plaster, plastics, paper, wire, etc., using the principles and elements of design. Four hours lab. Pr.: ART 100. ART-215-1-0-1002

ART 220. Water Color I. (2) I, II. Painting in water color and other water-soluble media; includes both studio and outdoor painting and sketching. Four hours lab. Pr.: ART 100, 190. ART-220-1-0-1002

ART 225. Figure Drawing I. (2) I, II. Sustained drawings of the human figure using a variety of media; introduction to human anatomy used by artists. Four hours lab. Pr.: ART 210. ART-225-1-0-1002

ART 230. Sculpture I. (2) I, II. An introduction to the problems of sculptural form; fundamental techniques and theory in clay modeling, molding, casting, and direct plaster. Four hours lab. Pr.: ART 100, 190. ART-230-1-0-1002

ART 235. Printmaking I. (2) I, II. Introduction to the intaglio, lithographic, and serigraphic printmaking techniques and tools. Four hours lab. May be taken for three semesters in order to obtain experience in each of the three techniques. Pr.: ART 100, 190. ART-235-1-0-1002

ART 240. Drawing III. (3) I, II. Continuation of Drawing II, emphasizing exploration in mixed media. Six hours lab. May be taken for two semesters. Pr.: ART 210. ART-240-1-0-1002

ART 245. Painting I. (2) I, II. Introduction to painting through a variety of media and techniques. Four hours lab. Pr.: ART 100, 190. ART-245-1-0-1002

ART 250. Spinning and Natural Dyes. (2) I, II. Basic instruction in use of spindle and spinning wheel; process of extracting and use of dye from commonly available plants. Four hours lab. Pr.: ART 100, 190. ART-250-1-0-1002

ART 255. Primitive Loom Construction. (2) I, II. Exploration of primitive loom systems and construction of some suited to individual purposes. Basic instruction in weaving with emphasis on acquisition and aesthetic use of commonly available materials. Four hours lab. Pr.: ART 100, 190. ART-255-1-0-1002

ART 260. Design in the Crafts. (2) I. Crafts work in various media, with emphasis on contemporary design. Four hours lab. May be taken for credit two semesters. Pr.: ART 100. ART-260-1-0-1002

ART 265. Ceramics I. (2) I, II. Introduction to basic hand building techniques; decoration of ceramic forms using slips, stains, glazes, etc. Student participation in Raku firing procedures; stacking and firing of electric kilns. Four hours lab. Pr.: ART 100. ART-265-1-0-1002

ART 270. Metalsmithing and Jewelry. (2) I, II. Design and execution of small-scale, three-dimensional objects, involving the basic processes of raising, forging, and fabrication in semi-precious metals. The techniques of centrifugal and vacuum casting of precious metals will also be introduced as well as soldering and piercing. Four hours lab. May be taken for credit three semesters. Pr.: ART 100 or nonmajors consent of instructor. ART-270-1-0-1002

ART 275. Weaving I. (2) I, II. Introduction to basic weaving techniques and the use of four harness looms. Emphasis on the aesthetic use of fibers. Four hours lab. Pr.: ART 100, 190. ART-275-1-0-1002

ART 280. Art Education Seminar. (2) II. An introduction to concepts in art education. Research, literature, creativity, aesthetics, and the history of art education as they relate to teaching art. ART-280-2-0831

ART 290. Lettering. (2) I, II. Study of traditional lettering forms, including Roman, Gothic, text, script, and some contemporary adaptations of these. Four hours lab. Pr.: ART 100, 190. ART-290-1-0-1002

ART 295. Photography in Art I. (2) I, II. Understanding and using photography as an art form. The basic elements and principles of art are explored. Camera usage and photographic processing are covered. An adjustable camera is required. Pr.: ART 100, 190. ART-295-1-0-1002

ART 300. Special Studies in Art. (1, 2) I, II. Specialized workshops or seminars conducted in studio, art therapy, art education, or art history. ART-300-2-1001

ART 305. Introduction to Museum Studies. (3) I, II. Fundamentals of museum work including specific museum functions, role of professional personnel, and proper care and handling of art works. ART-305-0-1003

ART 310. Sophomore Honors Seminar in Art. (3) Selected topics in art. Pr.: For students in the honors program only. ART-310-0-1002

ART 400. Computer Imaging. (3) I, II. Exploration of computer imaging through the use of paint system and image processing technologies. Two hours lecture, four hours lab a week. Pr.: ART 200 and ART 210. ART-400-1-1002

ART 410. B.F.A. Exhibition. (0) I, II. The preparation and execution of a senior exhibition of the student's own creative work primarily from his/her area of concentration. The student will be responsible for all the arrangements for the exhibition including scheduling, installation, and publicity. ART-410-1-0-1002

ART 420. History of South Asian Art. (3) I, II. A survey of the history of art in the South Asian subcontinent from its prehistoric origins to the height of the Mughal period in the eighteenth century A.D. Mythological, symbolic, tantric, and religious dimensions of South Asian art are studied as well as regionally important technical and aesthetic aspects. Includes the art of India, Pakistan, Bangladesh, Nepal, Sri Lanka, Afghanistan, Indonesia, and Indochina. ART-420-0-1003

ART 425. Art for Elementary Schools. (3) I, II, S. Art methods, materials, and philosophy of children's art at different grade levels. Six hours lab. ART-425-1-0-0831

ART 430. Independent Study—Ceramics. (1-5) I, II, S. Work in ceramics after competency has been achieved. Personal development is emphasized. ART-430-3-1002

ART 435. Independent Study—Crafts. (1-5) I, II, S. Work in crafts after competency has been achieved. Personal development is emphasized. ART-435-3-1002

ART 440. Independent Study—Drawing. (1-5) I, II, S. Work in drawing after competency has been achieved. Personal development is emphasized. ART-440-3-1002

ART 445. Independent Study—Graphic Design. (1-5) I, II, S. Work in graphic design after competency has been achieved. Personal development is emphasized. ART-445-3-1002

ART 450. Independent Study—Metalsmithing and Jewelry. (1-5) I, II, S. Work in metalsmithing and jewelry after competency has been achieved. Personal development is emphasized. ART-450-3-1002

ART 455. Independent Study—Painting. (1-5) I, II, S. Work in painting after competency has been achieved. Personal development is emphasized. ART-455-3-1002

ART 460. Independent Study—Printmaking. (1-5) I, II, S. Work in printmaking after competency has been achieved. Personal development is emphasized. ART-460-3-1002

ART 465. Independent Study—Sculpture. (1-5) I, II, S. Work in sculpture after competency has been achieved. Personal development is emphasized. ART-465-3-1002

ART 470. Independent Study—Water Color. (1-5) I, II, S. Work in water color after competency has been achieved. Personal development is emphasized. ART-470-3-1002

Undergraduate and graduate credit in minor field

ART 545. Twentieth Century Art History I. (3) I. Origins and development of twentieth century art from 1890 to 1914. Pr.: ART 195 or ART 196. ART-545-0-1003

ART 550. Twentieth Century Art History II. (3) II. Origins and development of twentieth century art from 1914 to 1950. Pr.: ART 195 or ART 196. ART-550-0-1003

ART 560. Art for Exceptional Children. (3) I, II. Using art concepts and activities to meet the needs of the mentally retarded, physically impaired, emotionally disturbed, or gifted child. Three hours lec. Pr.: PSYCH 110. Same as EDCI 560. ART-560-0-0831

ART 565. Ceramics II. (3) I, II. Advanced work on potter's wheel combined with hand-built forms. Consideration of simple kiln design, firing techniques, and procedures using various fuel burning kilns. Six hours lab. May be taken for four semesters. Pr.: ART 265. ART-565-1-0-1002

ART 570. Painting II. (3) I, II. Continuation of Painting I. Emphasis on a more extensive understanding of concepts about painting which will lead to the development of a wider range of personal experience and expression. Six hours lab. Pr.: ART 245. ART-570-1-0-1002

ART 575. Graphic Design and Illustration. (3-4) I, II, S. Problems in layout design and illustration for newspapers, magazines, and general advertising. Six hours lab. May be taken for four semesters. Final semester will include a portfolio project. Pr.: ART 205, 290, or consent of instructor. ART-575-1-0-1002

ART 585. Crafts for Children. (3) II. Studio experiences in crafts for elementary school age children. Emphasis will be on creative development with craft materials and processes. Pr.: ART 170 and consent of instructor. ART-585-1-0-1002

ART 602. Art since 1950. (3) I, II. Art movements beginning with abstract expressionism and continuing through pop, op, minimal, and conceptual art movements up to the present time. Pr.: ART 195 or ART 196. ART-602-0-1003

ART 604. Greek Art History. (3) I, II. The art of classical Greece, from its Aegean origins through the Hellenistic period. Pr.: ART 195 or ART 196. ART-604-0-1003

ART 612. Renaissance Art History. (3) I, II. Renaissance art of northern and southern Europe in the fifteenth and sixteenth centuries, with a brief discussion of its fourteenth century origins. Pr.: ART 195 or ART 196. ART-612-0-1003

ART 622. Baroque Art History. (3) I, II. The development of the baroque period in northern and southern Europe, from its beginnings in the early seventeenth century to the rococo style of the eighteenth century. Pr.: ART 195 or ART 196. ART-622-0-1003

ART 632. The Development of American Art. (3) I, II. American art from the Colonial period to the beginnings of abstract expressionism in the early 1940s, with major emphasis on the late nineteenth and early twentieth century developments. Pr.: ART 195 or ART 196. ART-632-0-1003

ART 634. History of Modern Sculpture. (3) I, II. Directions in sculpture since the time of Rodin. Pr.: ART 195 or ART 196. ART-634-0-1003

ART 642. Nineteenth Century Art History. (3) I, II. Painting, sculpture, and architecture of the late eighteenth and nineteenth centuries, with emphasis on the art of France. Pr.: ART 195 or ART 196. ART-642-0-1003

ART 654. Women in Art. (3) I, II. The work of women artists from early Middle Ages to the twentieth century, with emphasis on the contemporary period. Pr.: ART 195 or ART 196. ART-654-0-1003

ART 662. Southwestern Indian Arts and Culture. (3) I, II. The development of southwestern Indian silversmithing, weaving, pottery, basketry, and painting from the prehistoric period through the twentieth century. Pr.: ART 195 or ART 196. ART-662-0-1003

Undergraduate and graduate credit

ART 600. Advanced Drawing. (1-5. Credits over 3 hours must be approved by the instructor.) I, II. Upper-level drawing course with increased demands placed on the individual's manual abilities, conceptual development, and personal motivation. Lectures and problems directed toward an understanding of the historical development of drawing as well as investigations of contemporary attitudes. May be taken for four semesters. Pr.: ART 225, 240. ART-600-1-0-1002

ART 610. Figure Drawing II. (3) I, II. Continuation of Figure Drawing I, with emphasis on individual expression. Six hours lab. May be taken for four semesters. Pr.: ART 225. ART-610-1-0-1002

ART 615. Figure Painting. (3) I, II. Painting from the human figure with oil and plastic media. Six hours lab. May be taken for two semesters. Pr.: ART 245, 610. ART-615-1-0-1002

ART 620. Water Color II. (3) I, II. Continuation of Water Color I. Emphasis on individual expression within limitations of medium. Six hours lab. May be taken for two semesters. Pr.: ART 220. ART-620-1-0-1002

ART 625. Independent Study—Art Education. (1-5) I, II, S. Work offered in art education after competency has been achieved. Personal development is emphasized. Pr.: Full sequence of courses related to art education subject matter. ART-625-3-1002

ART 635. Printmaking II. (3) I, II. Advanced work in blockprints, serigraphy, lithography, and intaglio. Six hours lab. May be taken for four semesters. Pr.: ART 235. ART-635-1-0-1002

ART 645. Sculpture II. (3) I, II. Emphasis on artistic development through exploratory experiences in the various media. Introduction to foundry techniques and welding processes. Nine hours lab. May be taken for four semesters. Pr.: ART 230. ART-645-1-0-1002

ART 650. Painting III. (1-5) I, II. Continuation of Painting II. Emphasis on individual directions in painting to attain personal expression and competency. Primarily for undergraduate painting majors. May be taken for four semesters. Pr.: ART 570. ART-650-1-0-1002

ART 655. Metalsmithing Techniques. (3) I, II. Surface embellishment, container construction of various techniques, linkage, and mechanical problems will be explored in addition to stone setting. Nine hours lab. May be taken for three semesters. Pr.: ART 270. ART-655-1-0-1002

ART 660. Sculpture III. (1-5) I, II. Continuation of Sculpture II. Further exploration of media and technique, emphasizing the development of individual direction and expression. Primarily for undergraduate sculpture majors. May be taken for four semesters. Pr.: ART 580. ART-660-1-0-1002

ART 665. Ceramics III. (1-5) I, II. Individual exploration and further development of ceramic design and glaze technology; continuation of kiln design and construction. Six hours lab. May be taken for three semesters. Pr.: ART 565. ART-665-1-0-1002

ART 675. History of Ceramics. (3) I, II. History and development of ceramics; study of the use of pottery and other aspects of ceramics from earliest known records to present day. Use of slides and other visual materials. Pr.: ART 195 or 196. ART-675-0-1003

ART 680. Metals Workshop. (1-5) I, II. A number of metalsmithing techniques will be explored by the upper division student with emphasis on experimental problems and possibilities. The development of an individual point of view will predominate throughout the course. May be repeated twice. Pr.: ART 655. ART-680-1-0-1002

ART 685. Advanced Independent Study Design. (Var.) I, II, S. Advanced work in design-related subjects. Pr.: Full sequence of courses related to problem subject matter. ART-685-3-1002

ART 690. Techniques in Teaching Art. (Var.) I. Lectures and class discussion of methods, consideration of suitable laboratory equipment, use of illustrative material, and preparation of courses of study. Pr.: Twelve hours in art or consent of instructor. ART-690-0-0831

ART 695. Topics in Art History. (Var.) I, II, S. Independent exploration in selected problems in art history. Pr.: Twelve hours art history. ART-695-3-1003

Graduate credit

ART 825. Seminar in Art. (2) Selected topics dealing with historical, conceptual, or philosophical issues in the visual arts. May be repeated. Pr.: Graduate standing. ART-825-4-1002

ART 830. Graduate Sculpture Studies. (Var.) I, II, S. Advanced creative work with emphasis on technical and visual research. ART-830-3-1002

ART 835. Graduate Drawing Studies. (Var.) I, II, S. Advanced creative work with emphasis on technical and visual research. ART-835-3-1002

ART 845. Graduate Painting Studies. (Var.) I, II, S. Advanced creative work with emphasis on technical and visual research. ART-845-3-1002

ART 855. Graduate Printmaking Studies. (Var.) I, II. Advanced creative work with emphasis on technical and visual research. ART-855-3-1002

ART 865. Graduate Ceramics Studies. (Var.) I, II. Advanced creative work with emphasis on technical and visual research. ART-865-3-1002

ART 875. Graduate Metalsmithing and Jewelry Studies. (Var.) I, II, S. Advanced creative work with emphasis on technical and visual research. ART-875-3-1002

ART 885. Graduate Independent Study. (1-5) I, II, S. Advanced individual work offered in studio areas of ceramics, graphic design, drawing, painting, printmaking, sculpture, and metalsmithing and jewelry. ART-885-3-1002

ART 899. Research in Art. (Var.) I, II, S. Research which may form the basis for the master's of fine art thesis or report. ART-899-4-1002

Biochemistry

Owen J. Koeppe,* Acting Head

Professors Davis,* Hedgcoth,* Koeppe,* Kramer,* Reeck,* and Roche;* Associate Professors Mueller,* and Muthukrishnan,* D. Takemoto;* Assistant Professors Krishnamoorthi,* and Ochs;* Emeriti: Professors Burkhard, Clegg, Mitchell, Nordin, Parrish, and Ruliffson.

Biochemistry bridges the disciplines of biology and chemistry. A sound foundation in both disciplines as well as appropriate courses in calculus and physics are required. The aims of biochemistry are to provide an understanding of the structural and functional relationships of chemical constituents of cells and the role that they play in the processes of life.

Undergraduate study

The Department of Biochemistry offers work leading to bachelor of arts and bachelor of science degrees with majors in biochemistry. The B.A. degree provides a liberal education with sufficient emphasis on science for students who wish to prepare for certain professional schools. The B.S. degree prepares students for professional careers in biochemistry or entry in graduate biochemistry training programs.

Bachelor of arts

The requirements for the B.A. degree with a major in biochemistry include the general requirements of the College of Arts and Sciences plus the following:

| | | |
|-----------|-----------------------------------|---|
| BIOCH 100 | Biochemistry Orientation | 1 |
| CHM 220 | Chemical Principles I | 5 |
| | and | |
| CHM 250 | Chemical Principles II | 5 |
| | or | |
| CHM 210 | Chemistry I | 4 |
| | and | |
| CHM 230 | Chemistry II | 4 |
| | and | |
| CHM 271 | Chemical Analysis | 4 |
| CHM 531 | Organic Chemistry I | 3 |
| CHM 550 | Organic Chemistry II | 3 |
| CHM 532 | Organic Chemistry Laboratory | 2 |
| BIOCH 290 | Biochemistry Seminar | 2 |
| BIOCH 522 | General Biochemistry Laboratory | 2 |
| BIOCH 755 | Biochemistry I | 3 |
| BIOCH 765 | Biochemistry II | 3 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| BIOL 198 | Principles of Biology | 4 |
| | Biological science electives | 8 |

These science courses satisfy the mathematics and natural sciences requirements shown in the general requirements for the B.A. degree.

Bachelor of science

The requirements for the B.S. degree with a major in biochemistry include the general requirements of the College of Arts and Sciences plus the following:

| | | |
|-----------|--|-----|
| BIOCH 100 | Biochemistry Orientation | 1 |
| CHM 220 | Chemical Principles I | 5 |
| | and | |
| CHM 250 | Chemical Principles II | 5 |
| | or | |
| CHM 210 | Chemistry I | 4 |
| | and | |
| CHM 230 | Chemistry II | 4 |
| | and | |
| CHM 271 | Chemical Analysis | 4 |
| CHM 531 | Organic Chemistry I | 3 |
| CHM 550 | Organic Chemistry II | 3 |
| CHM 532 | Organic Chemistry Laboratory | 2 |
| BIOCH 290 | Biochemistry Seminar | 2 |
| BIOCH 755 | Biochemistry I | 3 |
| BIOCH 756 | Biochemistry I Laboratory | 2 |
| BIOCH 765 | Biochemistry II | 3 |
| CHM 585 | Physical Chemistry I | 3 |
| CHM 595 | Physical Chemistry II | 3 |
| | Upper division biochemistry or chemistry electives (one hour of which must be BIOCH 799, Problems in Biochemistry) | 3 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| PHYS 213 | Engineering Physics I | 5 |
| | and | |
| PHYS 214 | Engineering Physics II | 5 |
| | or | |
| PHYS 113 | General Physics I | 4 |
| | and | |
| PHYS 114 | General Physics II | 4 |
| BIOL 198 | Principles of Biology | 4 |
| | Biological science electives | 8 |
| | Biology, statistics, or computer science elective | 3-4 |
| | One year of modern language. French, German, or Russian is recommended for those interested in graduate studies. | |

The science courses in this list satisfy the natural science and quantitative reasoning requirements shown in the general requirements for the B.S. degree.

Transfer students

Community college students who plan to transfer into either of the biochemistry curricula at the junior level should take the following science courses during their first two years of college:

A year of freshman chemistry—lecture and laboratory

A semester of analytical chemistry—lecture and laboratory

A year of organic chemistry—lecture and laboratory

A year of analytic geometry and calculus

A year of biology—lecture and laboratory

Completion of these science courses should allow students to go directly into biochemistry and advanced biology courses upon entry into a biochemistry curriculum. For those planning to complete the B.S. requirements, it is advisable to have completed all three of the required semesters of analytic geometry and calculus before the junior year.

Graduate study

The Department of Biochemistry, as a participant in the interdepartmental Graduate Biochemistry Group, offers work leading to the master of science and doctor of philosophy degrees with majors in biochemistry. See the Graduate School section for further details.

The Department of Biochemistry also participates in interdepartmental programs in food science and genetics leading to the master of science and doctor of philosophy degrees with majors in the respective area. See the Graduate School section for further details.

Courses in biochemistry**Undergraduate credit**

BIOCH 100. Biochemistry Orientation. (1) I.

Discussion of biochemistry as a discipline in the life sciences. BIOCH-100-0-0414

BIOCH 101. Biochemistry Colloquium. (2) I, II.

Offered by TELENET. Topics in biochemistry chosen to illustrate current research of scientists and methods chosen to study biological problems from a biochemical point of view. At each offering of this course a syllabus will be available giving the topics to be studied and the details of administration of the course. May be repeated once. Not open to biochemistry majors. BIOCH-101-0-0414

BIOCH 110. Biochemistry and Society. (3) I, II. A cultural and environmental approach to biochemical compounds and circumstances affecting man. Topics to be discussed include compounds of biochemical interest, biochemical evolution, food additives, heavy metals, drugs, and certain control chemicals, e.g., pesticides. Intended for nonscience majors. BIOCH-110-0-0414

BIOCH 120. Introductory Organic and Biological Chemistry. (5) I, II, S. For students in human ecology, nursing, and other areas desiring an integrated organic and biochemistry course to provide an understanding of carbohydrates, proteins, lipids, and digestive and

metabolic systems. Three hours lec. and six hours lab a week. Pr.: CHM 110. BIOCH-120-1-0414

BIOCH 201. Elementary Biochemistry. (3) I, II. An elementary treatment of the chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids. Pr.: CHM 190. BIOCH-201-0-0414

BIOCH 290. Biochemistry Seminar. (2) II. Lectures and discussions on basic topics in biochemistry. Pr.: BIOCH 100. BIOCH-290-0-0414

BIOCH 300. Sophomore Honors Seminar in Biochemistry. (3) II. Lecture, guided reading, and discussion of topics of general interest in biochemistry. Topics will vary depending on the interests and backgrounds of students enrolled. Pr.: Freshman Honors Seminar. BIOCH-300-0-4900

BIOCH 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. May be used by honors students to satisfy B.S. requirement for BIOCH 799. Pr.: BIOCH 665 or conc. enrollment. BIOCH-499-4-0414

Undergraduate and graduate credit in minor field

BIOCH 521. General Biochemistry. (3) I, II, S. A basic study of the chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids, but at a more advanced level than BIOCH 201. Pr.: CHM 350. BIOCH-521-0-0414

BIOCH 522. General Biochemistry Laboratory. (2) I, II, S. A one-semester laboratory course with experiments relating to carbohydrates, lipids, proteins, nucleic acids, and enzymes. Six hours lab a week. Pr.: CHM 351 and BIOCH 521 or conc. enrollment, or BIOCH 665 or conc. enrollment. BIOCH-522-1-0414

Undergraduate and graduate credit

BIOCH 700. Advanced Topics in Plant Biochemistry. (3) I; 1990-91 and alternate years or on sufficient demand. An advanced treatment of topics of current interest in plant biochemistry, including photosynthesis and carbon metabolism, nitrogen fixation and nitrogen metabolism, structure and function of the higher plant genome, and production of material of economic interest. Pr.: *BIOCH 510 or 521 or 765. BIOCH-700-0-0414

BIOCH 755. Biochemistry I. (3) I. An introduction to physical methods, kinetics, and thermodynamics of biochemical reactions and bioenergetics, chemistry of proteins and amino acids, carbohydrate chemistry, and metabolism. BIOCH 755 and 765 are for students interested in a two-semester comprehensive coverage of biochemistry. For a one-semester course, enroll in BIOCH 521. Pr.: *Chemical analysis, one year of organic chemistry, differential and integral calculus. BIOCH-755-0-0414

BIOCH 756. Biochemistry I Laboratory. (2) I. An intensive laboratory course to accompany BIOCH 755. BIOCH 756 and 766 are sequential courses for students interested in a two-semester comprehensive coverage of experiments in biochemistry. For a one-semester laboratory course, enroll in BIOCH 522. Six hours lab a week. Pr.: *BIOCH 755 or conc. enrollment. BIOCH-756-1-0414

BIOCH 765. Biochemistry II. (3) II. Continuation of BIOCH 755; lipid chemistry and metabolism, amino acid metabolism, nutrition, nucleic acid chemistry and metabolism, integration of biochemical pathways and metabolic control mechanisms. Pr.: *BIOCH 755. BIOCH-765-0-0414

BIOCH 766. Biochemistry II Laboratory. (2) II. A continuation of CHM 756. Six hours lab a week. Pr.: *BIOCH 756 and 765 or conc. enrollment. BIOCH-766-1-0414

BIOCH 790. Physical Biochemistry. (3) I. A survey of biophysical methods most frequently encountered in biochemistry and related disciplines. The course emphasizes principles underlying methods used to determine the molecular weight and shape of biopolymers, and techniques used to detect conformational changes in polynucleotides, proteins, and polysaccharides. Pr.: *Calculus, a course in physical chemistry, BIOCH 755, 756, 765, and 766. BIOCH-790-1-0414

BIOCH 799. Problems in Biochemistry. (Var.) I, II, S. Problem may include laboratory and/or library work in various phases of biochemistry, agricultural chemistry, or nutrition. Pr.: *Background adequate for problem undertaken. BIOCH-799-3-0414

Graduate credit

BIOCH 806. Biochemistry Seminar. (0-1) I, II. Seminar for graduate students in biochemistry. BIOCH-806-0-0414

BIOCH 840. Intermediary Metabolism. (3) On sufficient demand. Metabolic role of carbohydrates, lipids, proteins and amino acids, purines, pyrimidines, vitamins, and hormones; biological oxidations; mechanisms of energy production and utilization. Pr.: *BIOCH 755 and 765. BIOCH-840-0-0414

BIOCH 845. Hormones. (3) I; 1990-91 and alternate years or on sufficient demand. The structure, biosynthesis, biochemical role, metabolism, and interrelations of hormones in vertebrates and invertebrates. Pr.: BIOCH 765. BIOCH-845-0-0414

BIOCH 899. Research in Biochemistry I. (Var.) I, II, S. Research in biochemistry which may be used for preparation of the M.S. thesis. Pr.: Sufficient training for research undertaken. BIOCH-899-4-0414

BIOCH 910. Lipids. (2) II; 1991-92 and alternate years. Chemistry of plant and animal lipids, their occurrence, metabolism, and industrial uses. Pr.: *BIOCH 765. BIOCH-910-0-0414

BIOCH 920. Nucleic Acids. (2) II; 1991-92 and alternate years. Structure and function of nucleic acids; structures and properties of DNA, RNA, and chromatin; recombinant DNA techniques; mutagenesis and carcinogenesis; protein-nucleic acid interactions; structural influences on replication, transcription, translation, and regulation. Pr.: BIOCH 765. BIOCH-920-0-0414

BIOCH 930. Proteins. (2) I; 1991-92 and alternate years. Lectures and readings on the chemical nature of proteins; fractionation; purification, structure, chemical and physical properties of proteins and amino acids. Pr.: *BIOCH 756 and 765. BIOCH-930-0-0414

BIOCH 940. Chemistry of Carbohydrates. (2) I; 1990-91 and alternate years. Lectures and readings on structural chemistry of carbohydrates, their general properties, biological and chemical reactions, and the methods of characterization. Pr.: *BIOCH 756 and 765. BIOCH-940-0-0414

BIOCH 950. Enzyme Chemistry. (3) II; 1990-91 and alternate years. The following properties of enzymes are considered: structure, specificity, catalytic power, mechanism of action, multienzyme complexes, kinetics, regulation, and pacemaker properties in multienzyme systems. Pr.: *BIOCH 765. BIOCH-950-0-0414

BIOCH 999. Research in Biochemistry II. (Var.) I, II, S. Research in biochemistry which may be used for preparation of the Ph.D. thesis. Pr.: Sufficient training for research undertaken. BIOCH-999-4-0414

*Nonmajors lacking these prerequisites should obtain consent of instructor before enrollment.

Biology

T. C. Johnson, Director

Professors Barkley,* Center,* Conrad,* Consigli,* Denell,* Iandolo,* T. Johnson,* Kramer,* Robel,* Roufa,* C. Smith,* Spooner,* Takemoto,* Wong,* and Zimmerman;* Associate Professors Guikema,* Kaufman,* Klaassen,* Marchin,* Perchellet,* Reichman,* Rintoul,* Seastedt,* Tomb,* Urban,* Weis,* Williams,* and Wilson;* Assistant Professors Chapes,* Fortner,* Hartnett,* Knapp,* Montelone,* A. Smith,* Upton,* and Welti;* Instructors Fitch, Hook and Paulsen; Emeriti: Professors Fina,* Goodrich,* Hansen,* Pady,* and Pittenger;* Associate Professors Lockhart* and McCracken;* Instructor Kundiger.

Undergraduate study

The biology undergraduate requirements provide students a basic understanding of biological principles and methods, and allow students to build on that base by further intensive or extensive study.

Course offerings and curricula accurately reflect both recent developments in the field of biology and changing requirements of students. Undergraduate majors are offered in biology, microbiology, and fisheries and wildlife biology, plus the professional (paramedical) and pre-professional areas. Students majoring in areas of the Division of Biology are assigned advisors to assist in planning their academic programs. Course offerings and degree requirements are sufficiently broad to allow great flexibility in tailoring a program of study to the interests and needs of an individual student. Undergraduate curriculum planning, including choice of areas of emphasis and elective courses, is ultimately the responsibility of students in consultation with their advisors.

Biology degree

Students may select a program leading to a B.A. or B.S. degree.

In addition to the general requirements of the College of Arts and Sciences, courses required for a bachelor's degree in biology are:

| | | |
|----------|-----------------------|---|
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| BIOL 430 | Population Biology | 4 |
| BIOL 540 | Molecular Biology | 3 |
| BIOL 541 | Cell Biology | 3 |

Plus 15 hours of elective credits taken in the Division of Biology (number 400 or higher) which must include two courses providing a laboratory experience.

The following courses given by other departments also are required:

| | | |
|----------|--------------------|---|
| PHYS 113 | General Physics I | 4 |
| | and | |
| PHYS 114 | General Physics II | 4 |
| | or | |

| | | |
|----------|----------------------------------|---|
| PHYS 213 | Engineering Physics I | 5 |
| | and | |
| PHYS 214 | Engineering Physics II | 5 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |

Note: MATH 100, 150, or two years of high school algebra and one semester of trigonometry are prerequisites to MATH 220, Analytic Geometry and Calculus I.

| | | |
|-----------|--------------------------------------|---|
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| | and | |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| | or | |
| CHM 531 | Organic Chemistry I | 3 |
| | and | |
| CHM 532 | Organic Chemistry I Laboratory | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| | or | |
| BIOCH 655 | Biochemistry I | 3 |
| BIOCH 665 | Biochemistry II | 3 |

Students contemplating graduate school are encouraged to take additional work in mathematics, computer science, statistics, and a modern foreign language.

Microbiology degree

Students in microbiology may obtain either the B.A. or B.S. degree. The requirements for a microbiology major, in addition to those requirements of the College of Arts and Sciences, include blocks A, B, and C as listed below.

Block A: Courses offered by other departments

| | | |
|-----------|--------------------------------------|---|
| MATH 220 | Analytical Geometry and Calculus I | 4 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |

Note: Prerequisites for MATH 220 are MATH 100 and 150 or four semesters of high school algebra and one semester of trigonometry plus appropriate math placement exam scores. Upon consultation with a Division of Biology advisor a student may elect the following substitutions: Biochemistry I and II for General Biochemistry; Organic Chemistry I and II for General Organic Chemistry; Organic Chemistry I Lab for General Organic Chemistry Lab; and Engineering Physics I and II for General Physics I and II.

Block B: Division of Biology courses

| | | |
|----------|-------------------------------------|---|
| BIOB 198 | Principles of Biology | 4 |
| BIOB 455 | General Microbiology | 4 |
| BIOB 540 | Molecular Biology | 3 |
| BIOB 670 | Immunology | 4 |
| BIOB 675 | Genetics of Microorganisms | 3 |
| BIOB 690 | Microbial Physiology and Metabolism | 2 |

Block C: Microbiology major electives

Students must take an additional 14 hours from courses listed below. At least half the 14-hour total must be laboratory courses.

| | | |
|-------------|-------------------------------------|-----|
| BIOB 397, | Topics in Biology | 1-3 |
| 495, or 697 | | |
| BIOB 410 | Biology of the Cancer Cell | 2 |
| BIOB 415 | Genetic Engineering | 2 |
| BIOB 530 | Pathogenic Microbiology | 3 |
| BIOB 541 | Cell Biology | 3 |
| BIOB 545 | Human Parasitology | 3 |
| BIOB 546 | Human Parasitology Lab (lab course) | 1 |

| | | |
|----------|--|-----|
| BIOL 625 | Animal Parasitology (lab course) ... | 4 |
| BIOL 640 | Introductory Mycology (lab course) | 4 |
| BIOL 671 | Immunology Lab (lab course) | 2 |
| BIOL 691 | Microbial Genetics Laboratory (lab course) | 3 |
| BIOL 698 | Problems in Biology (lab course) .. | 1-3 |
| BIOL 705 | Advanced Mycology (lab course) ... | 3 |
| BIOL 730 | General Virology | 3 |
| BIOL 755 | Specialized Cell Functions | 3 |

By consultation with a Division of Biology advisor a student may choose elective courses from Block C which allow a more specific focus on interest and experience. Areas of specialization would include prokaryotic microbiology, eukaryotic microbiology, biotechnology/genetic engineering, and infectious diseases. The microbiology curriculum coupled with appropriate electives provides an excellent education base for students moving directly into the job market, for students headed toward medical, dental, medical technology, and veterinary programs, and for students going into graduate programs in the biological sciences.

Fisheries and wildlife biology

Students in this major may obtain either the B.A. or B.S. degree. In addition to the requirements of the College of Arts and Sciences, fisheries and wildlife biology majors must take the courses of Block A, Block B, and one of the three options of Block C as shown below. Students who wish to qualify for professional certification as a fisheries or wildlife biologist should consult their academic advisors about any additional courses needed for such certification.

Block A: Courses offered by other departments

| | | |
|--------------------------------|---|-------|
| SPCH 106 | Public Speaking I | 3 |
| One math course* | | 4 |
| Four chemistry courses** | | 13 |
| PHYS 113 | General Physics I | 4 |
| and | | |
| PHYS 114 | General Physics II | 4 |
| or | | |
| PHYS 115 | Descriptive Physics | 4 |
| CIS 110 | Introduction to Personal Computing | 3 |
| or | | |
| CIS 200 | Fundamentals Computer Programming and Lab | 4 |
| STAT 340 | Biometrics I | 3 |
| | | 29-35 |

*To be selected from among MATH 100, 150, or 220.

**To be fulfilled by a sequence of CHM 210, 230, 350, and 351 or by a sequence of CHM 110, 190, 191, and BIOCHM 201.

Note: Students who plan to proceed into graduate programs should take MATH 220, CHM 210, 230, 350, and 351; PHYS 113 and 114; and CIS 200.

Block B: Division of Biology courses

| | | |
|--|-------------------------------|----|
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| BIOL 430 | Population Biology | 4 |
| BIOL 433 | Wildlife Conservation | 3 |
| BIOL 529 | Fundamentals of Ecology | 3 |
| BIOL 632 | Ecology Laboratory | 1 |
| Plus at least two courses in the Division of Biology (400 level or above) totaling 5 hours or more | | 5 |
| | | 25 |

Block C

Fisheries biology option

| | | |
|------------|--|----|
| STAT 341 | Biometrics II | 3 |
| BIOL 470 | Introductory Limnology | 4 |
| BIOL 513 | Physiological Adaptations of Animals | 3 |
| and | | |
| BIOL 514 | Physiological Adaptations of Animals Lab | 1 |
| BIOL 542 | Ichthyology | 3 |
| BIOL 680 | Aquaculture | 3 |
| BIOL 696 | Fisheries Management | 4 |
| | | 21 |

Wildlife biology option

| | | |
|------------|--|----|
| STAT 341 | Biometrics II | 3 |
| AGRON 501 | Range Management | 3 |
| AGEC 525 | Natural Resource Economics | 3 |
| ENTOM 312 | General Entomology | 2 |
| and | | |
| ENTOM 313 | General Entomology Lab | 1 |
| BIOL 513 | Physiological Adaptations of Animals | 3 |
| and | | |
| BIOL 514 | Physiological Adaptations of Animals Lab | 1 |
| BIOL 543 | Ornithology | 3 |
| BIOL 544 | Mammalogy | 3 |
| BIOL 551 | Taxonomy of Flowering Plants | 4 |
| BIOL 684 | Wildlife Management | 3 |
| BIOL 685 | Wildlife Management Techniques .. | 3 |
| | | 32 |

Natural history option

| | | |
|---|--|----|
| BIOL 551 | Taxonomy of Flowering Plants | 4 |
| or | | |
| FOR 330 | Dendrology I | 2 |
| and | | |
| FOR 340 | Dendrology II | 2 |
| BIOL 542 | Ichthyology | 3 |
| BIOL 543 | Ornithology | 3 |
| BIOL 544 | Mammalogy | 3 |
| BIOL 513 | Physiological Adaptations of Animals | 3 |
| and | | |
| BIOL 514 | Physiological Adaptations of Animals Lab | 1 |
| or | | |
| BIOL 500 | Plant Physiology | 4 |
| Nine hours of biology electives (400 level or above) .. | | 9 |
| | | 26 |

Hours from Block B may not be counted as a part of Block C electives.

Professional and pre-professional curricula

Students preparing to seek admission to medical, dental, veterinary, or similar professional schools may major in biology (or another academic discipline) provided the specific pre-professional requirements are met. Such students are encouraged to contact the appropriate pre-professional advisor in the dean's office as early in their academic careers as possible. This will permit the planning of a proper academic program for the students' professional goals.

The Division of Biology is intimately associated with several professional programs which are officially organized by the office of the dean of the College of Arts and Sciences. These programs are physical therapy, medical technology, pre-nursing, and a degree program in medical technology. Students with professional interests in these fields should contact either the

Division of Biology office or the dean's office.

Special advising is offered in connection with the College of Education for students preparing to be biology teachers in the secondary schools. For specific certification requirements in secondary education, please see the Education section of this catalog.

Graduate study

The division offers both the M.S. and the Ph.D. in numerous areas of biology. Degrees are specifically offered in biology and microbiology and through interdepartmental programs in animal breeding, biochemistry, and genetics. Graduate programs in the division generally relate to one of the five sections into which the division faculty is divided according to research interests and teaching interactions. These are: molecular biology and genetics, microbiology and immunology, developmental biology and physiology, systematics and ecology, and virology and oncology.

Graduate students may establish research advisory committees with faculty members from several of these sections as well as from appropriate departments outside of biology, thereby gaining a considerable latitude of expertise in developing the program of study. It should be noted that a graduate student's education is self-determined in consultation with the major professor and advisory committee; therefore the program of study is always designed to fit the student's particular interests and needs.

Courses in biology

Undergraduate credit

BIOL 101. Introduction to Biological Research. (1) S. An introduction to research strategies and techniques in the biological sciences. Current topics will be selected and studied through laboratory experience and lecture in a short course workshop format. May be repeated once. BIOL-101-1-0401

BIOL 107. Biological Science Colloquium. (2) I, II. Offered by TELENET. Topics in biological science chosen to illustrate current research of scientists and methods used to study the biological world. At each offering of this course a syllabus will be available giving the topics to be studied and the details of administration of the course. May be repeated once. Not open to biology majors. BIOL-107-0-0401

BIOL 198. Principles of Biology. (4) I, II, S. An introductory course concerned with the behavior of molecules, cells, organisms, and populations in an ecosystem-bound and evolving world. Audiotutorial format, equiv. to two hours lec., one hour rec., and three hours lab a week. BIOL-198-1-0401

BIOL 201. Organismic Biology. (5) I, II. A study of the structure and function of organisms with special attention paid to the phylogenetic origins of taxonomic groups and the integration of their structural systems. Three hours lec. and four hours lab. Pr.: BIOL 198 or equiv. BIOL-201-1-0401

BIOL 210. General Botany. (4) I, II. Plant groups and their evolutionary development. Physiology, anatomy, ecology, identification of seed plants, and economic applications. Two hours lec. and six hours lab a week. BIOL-210-1-0402

BIOL 222. Field Ornithology. (1) II, in odd years. Identification of bird species in the field and the illustration of attributes of avian behavior and ecology. One three-hour lab a week. Pr.: Sophomore standing. BIOL-222-1-0499

BIOL 240. Structure and Function of the Human Body. (6) I, II. Anatomy and physiology of the organ systems of the body. Course is directed toward nonbiology majors. Four hours lec. and two three-hour lab sessions a week. Pr.: BIOL 198. BIOL-240-1-0410

BIOL 303. Ecology of Environmental Problems. (3) II. Principles of ecology and their application to such problems as pollution, human population growth, and land-use planning. Two hours lec. and one hour discussion a week. Pr.: Two courses in natural science. BIOL-303-0-0420

BIOL 310. Biology and the Future of Man. (3) II. Discussions of recent developments in biological research and their impact on the social, moral, and ethical dimensions of man's existence. Topics covered include human reproduction, human genetics, aging, death, and organ transplantation. Three hours lec. a week. Pr.: Junior standing. BIOL-310-0-0401

BIOL 320. Economic Botany. (3) I, II. Origin and uses of cultivated plants useful to humans, especially grains, legumes, spices, beverage plants, fibers, and dyes. Pr.: BIOL 198 or BIOL 210. BIOL-320-0-0402

BIOL 365. Practicum in Biology. (1-4) I, II. Experimental approaches to learning biology through teaching. One hour rec. a week plus three to nine hours lab a week. Pr.: Permission of instructor and credit with superior performance in the course in which the student will be involved. BIOL-365-2-0401

BIOL 397. Topics in Biology. (1-6) I, II, S. Pr.: Consent of instructor. BIOL-397-2-0401

BIOL 399. Honors Seminar in Biology. (1-3) II. Selected topics. Open to nonmajors in the honors program. BIOL-399-0-4900

BIOL 400. Human Genetics. (3) I. A course dealing exclusively with human heredity and with those genetic principles that can be illustrated in humans. Pr.: BIOL 198. BIOL-400-0-0422

BIOL 410. Biology of the Cancer Cell. (2) I. Current concepts of cancer biology including roles of cell surfaces, cell division, viruses, self-recognition, and chemical carcinogens. Pr.: Two courses in biology. BIOL-410-0-0417

BIOL 430. Population Biology. (4) I. A study of the patterns and processes of inheritance and of changes in gene frequencies and numbers of individuals in interbreeding populations of individuals. Three hours lec. and one hour rec. Pr.: BIOL 201. BIOL-430-0-0420

BIOL 433. Wildlife Conservation. (3) II. An introductory course to the fields of fisheries and wildlife conservation, history of the conservation movement, review of important wildlife species, overview of management concepts, and exposure to wildlife-related issues. Pr.: BIOL 201. BIOL-433-0-0107

BIOL 455. General Microbiology. (4) I, II. Microorganisms; their morphology, physiology, classification, and importance. Two hours lec. and four hours lab a week. Pr.: One course in biology and a course in organic chemistry. BIOL-455-1-0411

BIOL 470. Introductory Limnology. (4) I, in even years. Basic ecological principles of aquatic environments. Plants and animals of local streams, rivers, ponds, and reservoirs are used to demonstrate the interaction of biological processes with the chemical and physical features of natural aquatic environments. Three hours lec., three hours lab a week; two optional weekend field trips. Pr.: BIOL 198. BIOL-470-1-0420

BIOL 495. Topics in Biology. (1-6) I, II, S. Pr.: Consent of instructor. BIOL-495-2-0401

BIOL 496. Honors Tutorial in Biology. (1-3) I, 11, S. Individual directed research and study of a topic in biology, normally as a prerequisite to writing a senior honor thesis. May be repeated once to a total of 3 hours

credit. Pr.: Sophomore standing, membership in the honors program of the College of Arts and Sciences, and permission of instructor. BIOL-496-3-4900

BIOL 497. Senior Honor Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. BIOL-497-3-4900

Undergraduate and graduate credit in minor field

BIOL 500. Plant Physiology. (4) I. Detailed consideration of physiological processes of higher plants. Three hours lec. and three hours lab a week. Pr.: BIOL 201 or BIOL 210; and a course in organic chemistry. BIOL-500-1-5-0406

BIOL 505. Comparative Anatomy of Vertebrates. (4) I. Interpretation of vertebrate structure with emphasis on function and phylogeny. Two hours lec. and six hours lab a week. Pr.: BIOL 198. BIOL-505-1-0412

BIOL 510. Embryology. (3) II. Developmental anatomy and physiology of reproduction of birds and mammals. Three hours lec. a week. Pr.: BIOL 198. BIOL-510-1-0427

BIOL 511. Embryology Laboratory. (1) II. One three-hour lab a week. Pr.: BIOL 510 or conc. enrollment. BIOL-511-1-0427

BIOL 513. Physiological Adaptations of Animals. (3) I. Integration of physiological mechanisms as the basis for adaptive responses of animals to different environments. Pr.: BIOL 201; and a course in organic chemistry or biochemistry. BIOL-513-0-0410

BIOL 514. Physiological Adaptations of Animals Laboratory. (1) I. One three-hour lab a week. Pr.: Conc. enrollment in BIOL 513. BIOL-514-1-0-0410

BIOL 526. Human Physiology. (3) II. Functions of various organ systems of mammals, primarily humans. Three hours lec. a week. Pr.: BIOL 198; and a course in biochemistry or organic chemistry. BIOL-526-1-5-0410

BIOL 529. Fundamentals of Ecology. (3) I. Ecosystem structure and function including energy flow; biogeochemical cycling; effect of climate, soil, fire, succession; application to land management practices. Three hours lec. a week and optional field trips. Pr.: BIOL 201 or 210; and CHM 210. BIOL-529-0-0420

BIOL 530. Pathogenic Microbiology. (3) I. Etiology and descriptions of major infectious diseases of humans within the perspective of host defenses. Two hours lecture and one hour laboratory-demonstration a week. Pr.: BIOL 455. BIOL-530-0-0411

BIOL 540. Molecular Biology. (3) I. An introduction to the synthesis and regulation of DNA, RNA, and protein. Mutation and the chromosome are studied at the molecular level. Emphasis is placed on recombinant DNA technology and on the handling of biological information in both higher and lower organisms. Pr.: BIOL 201 and CHM 350. BIOL-540-0-0416

BIOL 541. Cell Biology. (3) II. Structure and function of cells and subcellular components. A molecular understanding of membranes and cellular physiology will be emphasized. Three hours lec. Pr.: BIOL 540 and CHM 350. BIOL-541-0-0417

BIOL 542. Ichthyology. (3) II, in even years. Classification, morphology, physiology, distribution, and natural history of fishes. Two hours lec. and three hours lab a week. Pr.: BIOL 201. BIOL-542-1-0407

BIOL 543. Ornithology. (3) II. Classification, morphology, physiology, distribution, and natural history of birds. Two hours lec. and three hours lab a week. Pr.: BIOL 201. BIOL-543-1-0407

BIOL 544. Mammalogy. (3) I. Characteristics, evolution, life histories, and ecology of mammals, especially North American game species. Two hours lec. and three hours lab a week. Pr.: BIOL 201. BIOL-544-1-0407

BIOL 545. Human Parasitology. (3) II. Protozoan and helminth parasites of man with lesser emphasis on ectoparasitic arthropods. Emphasis on life cycles, control, and laboratory diagnosis. Three hours lec. a week. Pr.: BIOL 201. BIOL-545-0-0411

BIOL 546. Human Parasitology Laboratory. (1) II. Examination of prepared materials and identification of internal parasites of man. Two hours lab a week. Pr.: Conc. enrollment in BIOL 545. BIOL-546-1-0411

BIOL 547. Herpetology. (2) II, in odd years. Classification morphology, physiology, distribution, and natural history of amphibians and reptiles. One hour lec. and three hours lab a week. Pr.: BIOL 201. BIOL-547-1-3-0407

BIOL 550. Lower Plants. (3) II, in odd years. Morphology, adaptive mechanisms, and evolutionary relationships of the cellular and vascular cryptogams. Two hours lec. and one three-hour lab a week. Pr.: BIOL 201 or 210. BIOL-550-1-0402

BIOL 551. Taxonomy of Flowering Plants. (4) I. Morphology, taxonomy, and biogeography of the vascular plants. Two hours lec. and two three-hour labs a week. Pr.: BIOL 201 or 210. BIOL-551-1-0402

Undergraduate and graduate credit

BIOL 615. Cytogenetics. (4) I, in even years. Chromosome structure and mechanics, cytotaxonomy, and karyotypic analysis in eukaryotes. Two hours lec. and six hours lab a week. Field trips. Pr.: BIOL 430 or a course in genetics. BIOL-615-1-3-0422

BIOL 620. Evolution. (3) II, in even years. A study of the theory of evolution including its historical and social implications. Three hours lec. a week. Pr.: BIOL 430 or a course in genetics. BIOL-620-0-0422

BIOL 625. Animal Parasitology. (4) I, in odd years. Biology and pathology of the principal protozoan, helminth, and arthropod parasites of domestic animals and wildlife. Three hours lec. and two hours lab a week. Pr.: BIOL 198 and junior standing. BIOL-625-1-0411

BIOL 631. Ecology. (3) II. Descriptive and mathematical understanding of ecosystem structure and dynamics, including succession, energy flow, and nutrient cycling. Pr.: BIOL 430. BIOL-631-0-0420

BIOL 632. Ecology Laboratory. (1) II. Laboratory and field experiences with ecological problems. Pr.: STAT 340 or equiv., BIOL 631 or conc. enrollment. BIOL-632-1-0420

BIOL 645. Advanced Field Studies. (1-2) Offered in intersession only. Different ecosystems and the opportunity to apply classroom knowledge to field biology situations under the guidance of experienced biologists. Pr.: One course in field biology at or above the 400 level. BIOL-645-2-0401

BIOL 655. Genetics Laboratory. (3) II. Basic genetic principles of prokaryotic and eukaryotic organisms will be demonstrated through isolation and analysis of gene mutations. Two hours lec. and four hours of lab a week. Pr.: BIOL 430 or a course in genetics. BIOL-655-1-3-0422

BIOL 670. Immunology. (4) II. Chemical, genetic, and biological properties of the immune response, acquired immunity, and antibody production. Pr.: Two courses in biology; and a course in biochemistry or equiv. BIOL-670-0-0411

BIOL 671. Immunology Lab. (2) II. Laboratory exercises in immunology. Pr.: BIOL 670 or conc. enrollment. Three-hour lab a week plus one hour rec. BIOL-671-1-0411

BIOL 675. Genetics of Microorganisms. (3) I. The genetics of bacteria, viruses, and other microorganisms. Both the use of genetics in microbiological studies and the use of microbial systems to investigate basic genetic problems will be covered. Pr.: BIOL 455. BIOL-675-0-0422

- BIOL 680. Aquaculture.** (3) I, in odd years. Principles and methods of culturing fishes for commercial purposes. Topics of study include: species of fishes used in production; breeding; feeds and feeding of fishes; fish parasites and diseases; environmental requirements; facilities; and potential markets. Two hours lec. and three hours lab a week. Pr.: Two courses in biology, two courses in chemistry, and junior standing. BIOL-680-1-0107
- BIOL 684. Wildlife Management.** (3) II. Concepts of managing wildlife with emphasis on North American game species. Applied population dynamics as they relate to management, historical, and recent developments in wildlife management, habitat improvement, and related material. Three hours lec. a week. Pr.: BIOL 430 and 433. BIOL-684-0-0107
- BIOL 685. Wildlife Management Techniques.** (3) I. Ecology and management techniques. Two hours lec. and three hours lab a week. Pr.: BIOL 430 and 433. BIOL-685-1-0107
- BIOL 690. Microbial Physiology and Metabolism.** (2) II. The study of structure, function, regulation, and intermediary metabolism of bacteria. Pr.: BIOL 455; and BIOCH 521 or 765. BIOL-690-0-0411
- BIOL 691. Microbial Genetics Laboratory.** (3) II. Examination of the genetic processes of bacteria. A self-paced experimental regimen emphasizing current methodology employed in mutagenesis, selection, gene transfer, gene analysis, plasmid manipulation, and recombinant DNA technology. Pr.: BIOL 540 and BIOL 675. Enrollment limited to 12 students. BIOL-691-1-0411
- BIOL 696. Fisheries Management.** (4) I, in even years. Methods of managing fisheries resources; physical and biological survey methods; methods of aquatic environment improvement; fish population manipulation; management of streams, ponds, and lakes. Three hours lec. and three hours lab a week. Pr.: BIOL 433. BIOL-696-1-0107
- BIOL 697. Topics in Biology.** (1-6) I, II, S. Pr.: Consent of instructor. BIOL-697-2-0401
- BIOL 698. Problems in Biology.** (1-8) I, II, S. Pr.: Consent of instructor. BIOL-698-3-0401
- BIOL 699. Undergraduate Seminar in Biology.** (1) I, II. Pr.: Consent of instructor. BIOL-699-2-0401
- BIOL 702. Radiation Safety in the Research Laboratory.** (1) I. Principles of radioactive safety and radioisotope handling, licensing procedures, and laboratory techniques. Pr.: BIOL 198 or 555; and CHM 210 or PHYS 113. BIOL-702-1-0423
- BIOL 704. Introductory Mycology.** (4) I. Comparative morphology, classification, and life cycles of the fungi. Two hours lec. and six hours lab a week. Pr.: BIOL 201 or 210. BIOL-704-1-0411
- BIOL 710. Endocrinology.** (3) II. A survey of the glands of internal secretion in vertebrates with emphasis on mechanisms of control of hormone secretion and mechanisms of hormone action. Pr.: BIOL 198; and a course in organic chemistry or biochemistry. BIOL-710-0-0410
- BIOL 730. General Virology.** (3) II. Theoretical and experimental basis of virology, with emphasis on the role of the virus as a controlling force in cellular biology; principles of host-virus interactions; introduction to use of mammalian cell cultures as the host for virus propagation. Pr.: Twelve hours of biological sciences, including BIOL 455 or equiv.; and BIOCH 521 or equiv.; consent of instructor. BIOL-730-1-0411
- BIOL 735. Human Oncology.** (3) II. Etiology and pathogenesis of human cancer, with emphasis on the biology and biochemistry of the neoplastic process; host-tumor relationships; mechanism of action of anti-cancer drugs; and the clinical polychemotherapy of cancer. Pr.: BIOL 540 and BIOCH 521 or equiv. BIOL-735-0-0408
- BIOL 740. Anatomy of Higher Plants.** (3) II. Structure and development of the various tissues and organs of seed plants. Two hours lec. and one two-hour lab a week. Pr.: BIOL 201 or 210. BIOL-740-1-0402
- BIOL 755. Specialized Cell Functions.** (3) I, in even years. *In vitro* cell and organ culture techniques as tools for differentiation and specializations studies. Emphasis on mammalian cell culture systems with some study of plant cell culture. Two hours lec. and one three-hour lab a week. Pr.: BIOL 541. BIOL-755-1-0417
- Graduate credit**
- BIOL 800. Advanced Plant Physiology I.** (3) II, in even years. Modern concepts and research in plant physiology. Respiration, photosynthesis, and water relations of plants. Pr.: An introductory plant physiology course or general biochemistry. BIOL-800-0-0406
- BIOL 801. Advanced Plant Physiology II.** (3) II, in odd years. Modern concepts and research in plant physiology. Mineral nutrition, translocation, growth, and development of plants. Pr.: An introductory plant physiology course or general biochemistry. Previous enrollment in BIOL 800 is not required. BIOL-801-0-0406
- BIOL 805. Advanced Mycology.** (3) II, in even years. Study of fungi, with emphasis on structure, identification, classification, phylogeny, and economic importance. One hour lec. and six hours lab a week. Pr.: BIOL 704. BIOL-805-1-0411
- BIOL 810. Growth Regulation in Prokaryotes.** (2) I, in even years. The nature, dynamics, and regulation of cell growth and the cell cycle in prokaryotes. Pr.: BIOL 455; and BIOCH 755 or equiv. BIOL-810-0-0411
- BIOL 815. Plasmid Biology.** (2) II, in odd years. The current status of extrachromosomal inheritance in prokaryotic cells. Pr.: BIOL 455; and BIOCH 755 or equiv. BIOL-815-0-0411
- BIOL 820. The Lytic Bacteriophages.** (2) II, in even years. The regulation of gene expression as revealed through genetic and biochemical methods. Emphasis will be upon phages T4, T7, T5, and N4 of *Escherichia coli* and SP01 and PBS2 of *Bacillus subtilis*. Pr.: BIOL 455; and BIOCH 755 or equiv. BIOL-820-0-0411
- BIOL 825. Evolution of Animal Behavior.** (4) II, in even years. The study of mechanisms, ontogeny, and evolution of behavior stressing the adaptive nature of behavior. Two hours lec., one hour of discussion on assigned readings, and two to three hours lab a week. Lab format will be individual research projects requiring independent research skills. Pr.: BIOL 430 or equiv. BIOL-825-1-5-0420
- BIOL 826. Nutrient Dynamics.** (3) II, in odd years. The cycling of elements in ecosystems with emphasis on macronutrients such as nitrogen, phosphorous, and major cations, and the influence of variables such as acid rain on nutrient dynamics. Two hours lec. and two hours lab a week. Pr.: BIOL 529 and CHM 210. BIOL-826-1-5-0424
- BIOL 830. Advanced Virology.** (4) I. Application of current biochemical, biophysical, and biological techniques to the study of viruses, including bacterial viruses (bacteriophage), animal viruses, and plant viruses. Pr.: BIOL 730 and consent of instructor. BIOL-830-1-0411
- BIOL 840. Molecular and Cellular Immunology.** (3) I, in even years. Discussions and readings covering the molecular and cellular interactions during various phases of the immune response. Pr.: BIOL 670. BIOL-840-0-0411
- BIOL 850. Advanced Topics in Immunology.** (1-2) I, II. Current research in immunology. Pr.: BIOL 670 and consent of instructor. BIOL-850-3-0411
- BIOL 855. Molecular Biology of Cellular Membranes.** (3) I. A general coverage of membranes with respect to theories of structure, chemical and physical methods of study, methods of isolation, transport mechanisms, assembly and function of components, and receptors. Some specific membrane systems will be covered in detail including a review of recent references. Pr.: BIOL 541 and BIOCH 521. BIOL-855-0-0417
- BIOL 860. Molecular and Cellular Biology.** (3) I, in odd years. A study of the molecular biology of the cell. Regulation, organization, and synthesis of cellular constituents in both prokaryotic and eukaryotic cells will be studied in a comparative manner. Pr.: BIOCH 765 or equiv.; and consent of instructor. BIOL-860-0-0417
- BIOL 865. Advanced Plant Ecology.** (4) I, in even years. Advanced study of vegetation change and of the relationships of plants and environment at various developmental stages. Eight hours combined rec. and lab a week. Pr.: BIOL 500 and 529. BIOL-865-1-0420
- BIOL 868. Advanced Cellular and Developmental Biology.** (3) I, in odd years. Chemistry, structure, and function of cellular systems in growth, development, and reproduction. Pr.: BIOCH 755 or equiv. BIOL-868-0-0417
- BIOL 870. Advanced Systematic Botany.** (4) I, in odd years. Classification, nomenclature, and taxonomic theory of vascular plants. Two hours rec. and six hours lab a week. Pr.: BIOL 551. BIOL-870-1-0402
- BIOL 875. Evolutionary Ecology.** (3) I, in even years. A study of the evolution of population, community, and ecosystem structure. Two hours lec. and one hour rec. a week. Pr.: BIOL 529. BIOL-875-0-0420
- BIOL 885. Modeling in Biology.** (3) II, in even years. Conceptualization, construction, and interpretation of descriptive and predictive mathematical models used in biology, especially ecology. Pr.: A calculus (MATH 220) and statistics (STAT 702) course. BIOL-885-0-0419
- BIOL 888. Electron Microscopy Techniques.** (3) II. Theory and techniques involved in using the transmission electron microscope for the study of biological materials. Includes individualized instruction on the operation of the Philips 201 electron microscope and techniques for processing biological samples. Pr.: Current participation in research requiring electron microscope and consent of instructor. BIOL-888-1-0413
- BIOL 890. Advanced Topics in Biology.** (1-6) I, II, S. Pr.: Consent of instructor. BIOL-890-2-0401
- BIOL 891. Advanced Problems in Biology.** (1-8) I, II, S. Pr.: Consent of instructor. BIOL-891-3-0401
- BIOL 895. Graduate Seminar in Biology.** (1) I, II. Pr.: Consent of instructor. BIOL-895-0-0401
- BIOL 898. Master's Research in Biology.** (1-9) I, II, S. BIOL-898-4-0401
- BIOL 899. Master's Research in Microbiology.** (1-9) I, II, S. BIOL-899-4-0411
- BIOL 997. Postdoctoral Research in Biology.** (1-12) I, II, S. Advanced-level research in collaboration with a faculty member, involving projects in any area of biology. Pr.: Ph.D. degree or equivalent. BIOL-997-3-0401
- BIOL 998. Research in Biology.** (Var.) I, II, S. BIOL-998-4-0402
- BIOL 999. Research in Microbiology.** (Var.) I, II, S. BIOL-999-4-0411

Chemistry

M. Dale Hawley, Head

Professors Copeland,* Fateley,* Hammaker,* Hawley,* Isenhour,* Klabunde,* Kruh,* McDonald,* Meloan,* Moser,* Paukstelis,* Purcell,* and Setser;* Associate Professors Fry,* Hua,* Maatta,* and Sherwood;* Assistant Professors Dunczky,* Lenhert, and Rajca;* Emeriti: Professors Lambert,* and Schrenk;* Associate Professors Johnson* and Lanning.*

The Department of Chemistry occupies the Chemistry/Biochemistry Building, the H.H. King Chemical Laboratory, and part of Willard Hall. The faculty of the department consists of 19 Ph.D. chemists representing a broad range of specialization in the chemistry field. The department offers programs leading to the B.S., B.A., M.S., and Ph.D. degrees and, in addition, instruction is provided in introductory and advanced chemistry to undergraduate and graduate students in numerous other curricula.

Instruction and research in chemistry are conducted in laboratories well-equipped with modern facilities and instruments.

Undergraduate study

A significant number of graduates use their course of study as an effective preparation for further study in a life science such as medicine.

High school preparation

High school students who plan to major in chemistry should have a good background in mathematics and English composition. Trigonometry and two years of algebra are recommended, as are courses in chemistry and physics.

Transfer students

It is recommended that community college students take general chemistry, qualitative and quantitative analysis, one year of organic chemistry, analytic geometry, calculus, physics, and English composition prior to entering KSU.

Independent study and research

Many chemistry students at Kansas State University are engaged in independent study and research, some as early as the first year. One semester of research experience for academic credit is possible, under the supervision of a faculty member of the student's choice.

Dual degrees

Programs are available which lead to a dual degree in chemistry and another field such as chemical engineering, mechanical engineering, or agriculture. The degree requirements of both curricula must be met and a minimum of 150 credit hours completed.

Graduates of such a program are highly sought by industry and are especially well suited for graduate study in either field of their dual degrees.

Secondary education certification

Students who desire to become high school chemistry teachers may prepare for teacher certification while completing requirements in either the chemistry or chemical science curriculum. A student pursuing this plan will have advisors in both chemistry and education. For specific certification requirements in secondary education, see the College of Education section of this catalog.

Graduate study

Programs leading to the M.S. and Ph.D. degrees are offered. Research and graduate-level courses are conducted in analytical, inorganic, organic, and physical chemistry.

In order to be admitted to the graduate program leading to the M.S. or Ph.D. degree, a student must have completed undergraduate courses in chemistry, mathematics, and physics equivalent to those in the undergraduate chemistry curriculum. Prospective graduate students whose undergraduate training does not meet these requirements may be admitted on a provisional basis but, depending on placement exam results, may be required to take undergraduate courses, which may not be applied for graduate credit, to make up their deficiencies.

There are no formal foreign language requirements for advanced degrees in this department.

The Department of Chemistry requires all graduate students majoring in chemistry to teach at least one semester as part of their training for an advanced degree.

Information and a brochure describing fields of research, supporting facilities, financial support, and other aspects of graduate study may be obtained on request from the chairman, Graduate Assistantship Committee, Department of Chemistry, Manhattan, Kansas 66506-3701.

General undergraduate major requirement

Students majoring in chemistry or chemical science must earn grades of C or better in all courses prescribed for these curricula, as outlined below.

Chemistry curriculum for the B.S. degree*

The following is the preferred curriculum for those preparing for employment as chemists or those preparing for graduate study in chemistry.

120 credit hours required for graduation

| Chemistry (40-42 hours) | |
|--------------------------------|---|
| CHM 220 | Chemical Principles I 5 |
| | and |
| CHM 250 | Chemical Principles II 5 |
| | or |
| CHM 210 | Chemistry I 4 |
| | and |
| CHM 230 | Chemistry II 4 |
| | and |
| CHM 271 | Chemical Analysis 4 |
| CHM 531 | Organic Chemistry I 3 |
| CHM 532 | Organic Chemistry Laboratory 2 |
| CHM 545 | Chemical Separations 2 |
| CHM 550 | Organic Chemistry II 3 |
| CHM 585 | Physical Chemistry I 3 |
| CHM 595 | Physical Chemistry II 3 |
| CHM 598 | Physical Chemistry II Laboratory .. 2 |
| CHM 657 | Inorganic Techniques 2 |
| CHM 666 | Instrumental Analysis 3 |
| CHM 667 | Instrumental Analysis Laboratory .. 1 |
| CHM 697 | Structure and Bonding 2 |
| CHM 698 | Inorganic Chemistry 3 |
| CHM 599 | Undergraduate Research 2 |
| | or |
| CHM 551 | Advanced Organic Laboratory (may be taken prior to the senior year.) .. 2 |
| Mathematics (12 hours) | |
| MATH 220 | Analytic Geometry and Calculus I .. 4 |
| MATH 221 | Analytic Geometry and Calculus II 4 |
| MATH 222 | Analytic Geometry and Calculus III 4 |

*A program leading to the B.A. degree may be planned by modifying the social sciences and humanities requirements. See general college information for specific requirements for the B.A. degree.

Physics (10 hours)

| | |
|----------|--------------------------------|
| PHYS 213 | Engineering Physics I 5 |
| PHYS 214 | Engineering Physics II 5 |

Chemical science curriculum for the B.S. degree*

The following is the preferred curriculum for those intending to use their chemical training as a background for work or study in another area such as medicine, education, law, biology, or agriculture.

120 credit hours required for graduation

| Chemistry (27-30 hours) | |
|--|---|
| CHM 220 | Chemical Principles I 5 |
| | and |
| CHM 250 | Chemical Principles II 5 |
| | or |
| CHM 210 | Chemistry I 4 |
| | and |
| CHM 230 | Chemistry II 4 |
| | and |
| CHM 271 | Chemical Analysis 4 |
| CHM 531 | Organic Chemistry I 3 |
| CHM 532 | Organic Chemistry Laboratory 2 |
| CHM 545 | Chemical Separations 2 |
| CHM 550 | Organic Chemistry II 3 |
| CHM 551 | Advanced Organic Laboratory 2 |
| | and |
| One additional course in chemistry or biochemistry | |
| | or |
| CHM 666 | Instrumental Analysis 3 |
| | and |
| CHM 667 | Instrumental Analysis Laboratory .. 1 |
| CHM 500 | General Physical Chemistry 3 |
| | or |
| CHM 585 | Physical Chemistry I 3 |
| Mathematics (8 hours) | |
| MATH 220 | Analytic Geometry and Calculus I .. 4 |
| MATH 221 | Analytic Geometry and Calculus II 4 |

Physics (8 hours)

| | | |
|----------|--------------------|---|
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |

*A program leading to the B.A. degree may be planned by modifying the social sciences and humanities requirements. See general college section for specific requirements for the B.A. degree.

Introductory and general chemistry**Undergraduate credit**

CHM 100. Concepts in Chemistry. (1) I. A first course in chemistry for students without high school chemistry or students who wish to improve their background in chemistry before taking Chemistry I or General Chemistry. The mole concept, chemical stoichiometry, introduction to atomic structure. One hour lec. a week. Pr.: MATH 010 or equiv. CHM-100-0-1905

CHM 101. Chemical Science Colloquium. (2) I, II. TELENET only. Current topics in chemistry presented by a distinguished international authority and moderated by a KSU faculty member. Syllabus provided and final original paper required. May be repeated once. Not open to chemistry majors. CHM-101-0-1905

CHM 110. General Chemistry. (5) I, II, S. Principles, laws, and theories of chemistry; important metallic and nonmetallic substances. Three hours lec., one hour rec., and three hours lab a week. CHM-110-1-8-1905

CHM 195. Approved Techniques in Criminalistics. (3) Intersession only. Physical evidence at a crime scene and its examination in the laboratory. Soils, glass, hair fibers, drugs, explosives, poisons, castings, inks, and arson and rape situations are investigated. CHM-195-1-0-1909

CHM 200. Undergraduate Seminar in Chemistry. (0, 1) I, II. Programs and activities of chemical interest including lectures given by undergraduate chemistry majors. CHM-200-0-1905

CHM 210. Chemistry I.* (4) I, II, S. First course of a two-semester study of the principles of chemistry and the properties of the elements and their compounds. Three hours lec. and three hours lab a week. Pr.: One year of high school chemistry (or CHM 100) and MATH 010 (or equiv.). CHM-210-1-7-1905

*In the fall semester, the chemistry department conducts an accelerated program which provides the opportunity for students with good preparation in high school chemistry to earn credit in both CHM 210, Chemistry I and CHM 230, Chemistry II. Credit in Chemistry I is earned through satisfactory performance on a review examination given the second week of the semester and completion of a special laboratory of three hours per week. Credit in Chemistry II is earned through a special lecture program. Guidelines for assignment to this program are published in *Your First Year at K-State!* (under CHM 210, 230. The Accelerated Program, Chemistry I and II), and are available from the chemistry department.

CHM 220. Chemical Principles I. (5) I. First course of a two-semester study of chemical principles. For students in curricula with a major emphasis in chemistry. Three hours lec. and six hours lab a week. Pr.: High school chemistry (one year) and algebra (one and one-half years). CHM-220-1-6-1905

CHM 230. Chemistry II. (4) I, II, S. Second course of a two-semester study of the principles of chemistry and the properties of the elements and their compounds. Three hours lec. and three hours lab a week. Pr.: CHM 210. CHM-230-1-7-1905

CHM 250. Chemical Principles II. (5) II. Continuation of CHM 220, covering the principles of chemistry. Laboratory stresses quantitative chemistry. Three hours lec. and six hours lab a week. Pr.: CHM 220. CHM-250-1-6-1905

CHM 399. Sophomore Honors Seminar. (3) Open to students in the arts and sciences honors program. CHM-399-0-4900

CHM 498. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. CHM-498-4-0401

CHM 499. Problems in Undergraduate Chemistry. (Var.) I, II, S. Problems may include classroom and/or lab work. Pr.: Consent of instructor. CHM-499-3-1905

Undergraduate and graduate credit in minor field

CHM 599. Undergraduate Research. (1, 2, 3) I, II, S. Analytical, inorganic, organic, or physical chemistry. CHM-599-4-1905

Undergraduate and graduate credit

All chemistry courses numbered 600 or above require the following as minimum prerequisites: CHM 550, Organic Chemistry II; CHM 532, Organic Chemistry Laboratory; CHM 595, Physical Chemistry II; and CHM 598, Physical Chemistry II Laboratory.

CHM 600. Scientific Glassblowing. (1) II. The basic techniques of bending, sealing, and blowing glass used to fabricate scientific glassware. Three hours of laboratory including one lecture-demonstration a week. Pr.: Senior or graduate standing in physical sciences. CHM-600-1-2-1905

CHM 700. Practicum in Teaching Chemistry. (1) I. Principles and methods of instruction in laboratories and recitation classes in chemistry, including one semester of supervised experience as an instructor in a chemical laboratory. This is a required course of all teaching assistants in the Department of Chemistry. May be taken only once for credit. Pr.: Senior standing in chemistry. CHM-700-2-1905

CHM 799. Problems in Chemistry. (Var.) I, II, S. Problems may include classroom or laboratory work. Not for thesis research. Pr.: Consent of instructor. CHM-799-3-1905

Graduate credit

CHM 899. Research in Chemistry. (Var.) I, II, S. Research in analytical chemistry, inorganic chemistry, organic chemistry, and physical chemistry for the M.S. degree. CHM-899-4-1905

CHM 999. Research in Chemistry. (Var.) I, II, S. Research in analytical chemistry, inorganic chemistry, organic chemistry, and physical chemistry for the Ph.D. degree. CHM-999-4-1905

Analytical chemistry**Undergraduate credit**

CHM 240. Environmental Chemistry Laboratory. (1) II. Selected experiments in air quality, water quality, and other environmental topics. Three hours lab a week. Pr.: CHM 230 or conc. enrollment. CHM-240-1-0-1909

CHM 271. Chemical Analysis. (4) II. Principles of chemical equilibria and qualitative, gravimetric, and titrimetric analyses. Two hours lec. and six hours lab a week. Pr. or conc.: CHM 230. CHM-271-1-5-1909

Undergraduate and graduate credit in minor field

CHM 545. Chemical Separations. (2) II. Principles of modern separation techniques. One hour lec. and three hours lab a week. Pr.: CHM 250 or CHM 271. CHM-545-1-5-1909

Undergraduate and graduate credit

CHM 666. Instrumental Analysis. (3) I. Three hours lec. a week. CHM-666-0-1909

CHM 667. Instrumental Analysis Laboratory. (1) I. Three hours lab a week. CHM-667-1-0-1909

CHM 668. Chemical Equilibria. (1) I. One hour lec. a week. CHM-668-0-1909

CHM 725. Instrumentation in Chemistry. (3) On sufficient demand. Theory and practice of instrument design for use in chemical research. Study of the flow of energy and information in systems for measurement and control. Two hours lec. and three hours lab a week. Pr.: CHM 666 or consent of instructor. CHM-725-1-1909

Graduate credit

CHM 901. Graduate Seminar in Analytical Chemistry. (0-1) I, II, S. CHM-901-0-1909

CHM 921. Advanced Separations. (2) I, in even years. Two hours lec. a week. CHM-921-0-1909

CHM 922. Advanced Separations Laboratory. (1) I, in even years. Three hours lab a week. CHM-922-1-0-1909

CHM 937. Applications of Surface Science to Chemistry. (2) I, in odd years. Chemical bonding in the solid state. Surface science and related techniques as applied to chemical problems. Special topics including data analysis and corrosion studies. Pr.: CHM 697 and 710. CHM-937-0-1906

CHM 942. Advanced Analytical Chemistry. (3) I, in odd years. Elemental and functional group analyses, nonaqueous solvent systems, gas analysis, kinetics, and thermal methods of analysis. CHM-942-0-1909

CHM 944. Electroanalytical Chemistry. (2-3) II, in even years. Theory and applications of electrochemical methods; chronoamperometry, chronopotentiometry, cyclic voltammetry, coulometry, polarography, potentiometry, and instrumentation. CHM-944-1-1909

CHM 946. Principles and Techniques of Analytical Chemistry I. (1-5) II, in odd-numbered years. A lecture and laboratory course on emission spectroscopy, flame photometry, atomic absorption, and x-ray methods. CHM-946-1-1909

CHM 947. Principles and Techniques of Analytical Chemistry II. (1-4) II, in even-numbered years. A lecture and laboratory course on ultraviolet and visible absorption, infrared and Raman methods, fluorescence, phosphorescence, polarimetry, and refractometry. CHM-947-1-1909

CHM 948. Computer Control of Chemical Instruments. (3) The technique and use of a minicomputer in the laboratory, including interface hardware and software for digital and analog data acquisition and display and instrument control. Two hours lec. and three hours lab a week. Pr.: CHM 725. CHM-948-1-1909

Inorganic chemistry**Undergraduate and graduate credit**

CHM 650. History of Chemistry. (2) II, in even years. Traces the beginnings of chemistry from 3500 B.C. to 1920 A.D. Early metallurgy, Greek thought about atoms, alchemy, atomic theory, discovery of gases; definition of elements, chemical bonds, organic, inorganic, and physical chemistry. Pr.: CHM 585. CHM-650-0-1905

CHM 657. Inorganic Techniques. (2) II. The preparation, characterization, and study of transition metal, main group, and organometallic compounds of unusual interest, using techniques commonly encountered in industrial and academic research. Six hours lab a week. Pr.: CHM 585. CHM-657-1-0-1906

CHM 697. Structure and Bonding. (2) I. Atomic and molecular structure, bonding concepts used in the practice of inorganic chemistry. This material forms a foundation for higher level courses in inorganic chemistry. Pr.: CHM 550, 595. CHM-697-0-1906

CHM 698. Inorganic Chemistry. (3) II. Aspects of the structures, reactions, reaction mechanisms, and spectral properties of transition metal and non-metal compounds. Three hours lec. a week. Pr.: CHM 697. CHM-698-0-1906

CHM 710. Chemical Applications of Group Theory. (1) I. Applications of group theory to molecular structure, bonding, and spectra. One hour lec. a week. CHM-710-0-1906

Graduate credit

CHM 800. Chemistry in Outer Space and in the Laboratory. (2) II, in odd years. The generation of reactive atoms and molecules in outer space and in the laboratory is covered, as well as their chemical reactions and spectroscopy. Extreme conditions of high and low temperatures, synthesis using atoms, and matrix isolation are discussed. Pr.: CHM 698. CHM-800-0-1905

CHM 902. Graduate Seminar in Inorganic Chemistry. (0-1) I, II, S. CHM-902-0-1906

CHM 929. Physical Methods in Inorganic Chemistry. (3) II. Theory and application of infrared, Raman, visible, ultraviolet, NMR, ESR, NQR, Mossbauer, and mass spectrometry to inorganic chemistry. Three hours lec. a week. Pr.: CHM 697, 710. CHM-929-0-1906

CHM 930. Homogeneous Catalysis. (2) II, in even years. The study of industrially important and synthetically useful catalysis of organic reactions by soluble metal complexes. Two hours lec. a week. Pr.: CHM 698 or consent of instructor. CHM-930-0-1906

CHM 935. Selected Topics in Inorganic Chemistry. (1-3) I, II. A lecture course in inorganic chemistry in areas of specialization of the faculty, with emphasis on current developments. Specific topics will be changed from semester to semester, so a student may take the course for credit more than once. Pr.: Consent of instructor. CHM-935-0-1906

CHM 936. Electronic Structure of Molecules and Solids. (2) I, in even years. Electronic structure calculations and interpretations of results using the instructor's software. Pr.: CHM 697 and CHM 710. CHM-936-0-1906

Organic chemistry**Undergraduate credit**

CHM 190. Elementary Organic Chemistry. (3) II. A brief introduction to the principles of organic chemistry for students in certain agriculture and home economics curriculums. Conc. enrollment in CHM 351 is allowable for lab if needed. Three hours lec. a week. Pr.: CHM 110. CHM-190-0-1907

CHM 350. General Organic Chemistry. (3) I, II, S. A survey of types of organic reactions important to biological science areas including pre-veterinary and certain agriculture and home economics programs. Conc. enrollment in CHM 351 is urged. Three hours lec. a week. Pr.: CHM 230. CHM-350-0-1907

CHM 351. General Organic Chemistry Laboratory. (2) I, II, S. One five-hour lab and one hour of lec. a week. Pr. or conc.: CHM 350 or 190. CHM-351-1-1907

Undergraduate and graduate credit in minor field

CHM 531. Organic Chemistry I. (3) I, II. General principles of organic chemistry; study of the main types of aliphatic compounds, with an introduction to fats, carbohydrates, amino acids, proteins, and aromatic compounds. Required for the chemistry curricula and for entrance to medical schools. Three hours lec. a week. Pr.: CHM 230 or 250. CHM-531-0-1907

CHM 532. Organic Chemistry Laboratory. (2) I, II. One five-hour lab and one hour of lec. a week. Pr.: CHM 531. CHM-532-1-1907

CHM 550. Organic Chemistry II. (3) I, II. Continuation of CHM 531, including additional aromatic chemistry, condensation reactions, and introduction to some advanced topics, such as dyes, polymers, and heterocyclic chemistry. Three hours lec. a week. Pr.: CHM 531. CHM-550-0-1907

CHM 551. Advanced Organic Laboratory. (2) I, II. One five-hour lab and one hour of lec. a week. Pr.: CHM 550 and CHM 532. CHM-551-1-1907

Graduate credit

CHM 852. Advanced Organic Chemistry. (3) I. Advanced study of organic compounds and fundamental types of reactions. Three hours lec. a week. CHM-852-0-1907

CHM 860. Synthetic Organic Chemistry. (4) II. Conditions, scope, and applications of reactions useful in synthetic organic chemistry. Four hours lec. a week. CHM-860-0-1907

CHM 862. Organic Spectroscopy. (3) II. The principles of IR, UV-VIS, mass, and NMR spectroscopies applied to the problem of structure determination. Three hours lec. a week. CHM-862-0-1907

CHM 903. Graduate Seminar in Organic Chemistry. (0-1) I, II, S. CHM-903-0-1907

CHM 965. Physical Organic Chemistry. (3) I. Principles of orbital symmetry, thermochemistry, kinetics, and other topics applied to the understanding of reaction mechanisms. Three hours lec. a week. CHM-965-0-1907

CHM 970. Selected Topics in Organic Chemistry. (1-3) On sufficient demand. A lecture course in organic chemistry in areas of specialization of the faculty, with emphasis on current developments. Specific topics will be changed from semester to semester, so a student may take the course for credit more than once. CHM-970-0-1907

Physical chemistry**Undergraduate and graduate credit in minor field**

CHM 500. General Physical Chemistry. (3) II. Elementary principles of physical chemistry. Three hours lec. a week. Pr.: CHM 230 or CHM 250 and MATH 210 or MATH 220. CHM-500-0-1908

CHM 585. Physical Chemistry I. (3) I. Elementary chemical thermodynamics and kinetic theory of gases. Three hours lec. a week. Pr.: CHM 230 or CHM 250, MATH 222, PHYS 214. CHM-585-0-1908

CHM 586. Physical Chemistry I Laboratory. (2) I. Six hours lab a week. Pr.: CHM 250 or CHM 271, CHM 585 or conc. enrollment. CHM-586-1-1908

CHM 595. Physical Chemistry II. (3) II. Elementary quantum chemistry, spectroscopy, statistical thermodynamics, and chemical kinetics. Three hours lec. a week. Pr.: CHM 585. CHM-595-0-1908

CHM 598. Physical Chemistry II Laboratory. (2) II. Six hours lab a week. Pr.: CHM 250 or CHM 271 and CHM 595 or conc. enrollment. CHM-598-1-1908

Graduate credit

CHM 801. Chemical Thermodynamics. (3) II, in alternate years. The laws, principles, and methods of thermodynamics and their applications to chemical systems. Statistical-molecular approach emphasized. Three hours lec. a week. CHM-801-0-1908

CHM 854. Theoretical Chemistry I. (3) I. Introduction to quantum mechanics and atomic and molecular spectroscopy. Three hours lec. a week. CHM-854-0-1908

CHM 856. Chemical Kinetics. (3) I, in alternate years. Survey of experimental and/or theoretical aspects of dynamics of chemical reactions. Three hours lec. a week. Pr.: CHM 801 or CHM 854. CHM-856-0-1908

CHM 904. Graduate Seminar in Physical Chemistry. (0-1) I, II, S. Presentation of topics from literature in physical chemistry. CHM-904-0-1908

CHM 950. Chemical Statistical Mechanics. (3) I, in alternate years. Application of classical and quantum statistical mechanics to chemical phenomena. Three hours lec. a week. Pr.: CHM 801, 854. CHM-950-0-1908

CHM 954. Theoretical Chemistry II. (3) II. Quantum theory of atomic and molecular structure. Three hours lec. a week. Pr.: CHM 854. CHM-954-0-1908

CHM 955. Selected Topics in Physical Chemistry. (1-3) On sufficient demand. A lecture course in physical chemistry in areas of specialization of the faculty, with emphasis on current developments. Specific topics will be changed from semester to semester, so a student may take the course for credit more than once. Pr.: CHM 854. CHM-955-0-1908

Computing and Information Sciences

Virgil E. Wallentine, Head

Professors Hankley,* Unger,* and Wallentine;* Associate Professors Calhoun,* Gustafson,* and VanSwaay;* Assistant Professors Bleyberg,* Howell,* Melton,* Mizuno,* Ravindran,* and Schmidt;* Instructor Campbell.

Undergraduate study

The creation and use of the best possible hardware and software is, broadly speaking, the field of computer science.

Two curricula, computer science and information systems, are offered by the Department of Computing and Information Sciences. Many other fields increasingly require a minor emphasis in computer science, and students working toward a dual degree (one in computer science and one in some other field) are increasingly common.

The department maintains laboratories with extensive mini- and microcomputers. Large computer facilities are provided by KSU Computing and Telecommunications Activities. Some students choose to own or share microcomputers because of the convenience and learning efficiency of personal interactive computing.

Computer-science curriculum

The computer science curriculum emphasizes a broad foundation of computer organization and software and mathematics, together with electives which focus on some aspect or application of computers. The computer science curriculum is recommended for persons planning graduate studies in computing.

Technical electives consist of a set of computer science courses which permit the student to concentrate on an area of technical expertise. The most common technical areas are: software engineering which involves management and development of large software systems; business applications programming; operating systems which consist of the supervisory software that controls the operation of a computer; theoretical computer science; computer systems architecture which involves design of centralized and distributed computer systems; programming languages and their compilers; data base systems; and knowledge engineering (artificial intelligence).

A person seeking a bachelor of science or bachelor of arts degree in computer science must fulfill the general requirements of the College of Arts and Sciences and the following:

| | | |
|-----------|---|---|
| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| MATH 510 | Discrete Mathematics | 3 |
| PHILO 220 | Symbolic Logic I | 3 |
| STAT 410 | Probabilistic Systems Modelling ... | 3 |
| EECE 241 | Introduction to Computer Engineering | 3 |
| CIS 200 | Fundamentals of Computer Programming | 3 |
| CIS 203 | Fundamentals of Computer Programming Laboratory | 1 |
| CIS 300 | Algorithms and Data Structures ... | 3 |
| CIS 350 | Computer Architecture and Organization | 3 |
| CIS 500 | Analysis of Algorithms and Data Structures | 3 |
| CIS 505 | Introduction to Programming Languages | 3 |
| CIS 520 | Operating Systems I | 3 |
| CIS 540 | Software Engineering Project I | 3 |
| CIS 541 | Software Engineering Project II | 3 |
| CIS 560 | Introduction to Data Management Systems | 3 |
| CIS 570 | Theoretical Foundations of Computing | 3 |

With B.A. degree:
 Technical electives (with advisor's approval) 6

| | | |
|---|--|---|
| With a B.S. degree: | | |
| ENGL 516 | Written Communication for the Sciences | 3 |
| MATH 655 | Elementary Numerical Analysis ... or Numerical Computing | 3 |
| CIS 580 | Numerical Computing | 3 |
| Technical electives (with advisor's approval) 9 | | |

Required courses may not be taken under the A/Pass/F option.

Information systems curriculum

The information systems curriculum emphasizes the use of computers to solve problems arising in the operation of business and commerce. The curriculum follows closely programs designed by the Association for Computing Machinery and the Data Processing Management Association.

Five specializations are available, each designed to develop additional skills supportive of needs of the industry. These specializations are database manager (designs, uses, maintains, and manages database systems), management information systems (MIS) specialist (defines organization requirements, acts as a management-technical communication channel, evaluates information systems, manages analyst/programmers), application programmer (designs detail logic, codes, verifies, documents programs and systems), and communications analyst (designs and implements distributed information systems, specifies and designs interface to the communication system.)

A person seeking a bachelor of science or bachelor of arts degree in information systems must fulfill the general requirements of the College of Arts and Sciences and the following:

| | | |
|--|---|----|
| ENGL 516 | Written Communication for the Sciences | 3 |
| MATH 205 | General Calculus and Linear Algebra | 3 |
| MATH 312 | Finite Applications of Mathematics | 3 |
| STAT 320 | Elements of Statistics | 3 |
| EECE 241 | Introduction to Computer Engineering | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS 203 | Fundamentals of Computer Programming Laboratory | 1 |
| CIS 300 | Algorithms and Data Structures ... | 3 |
| CIS 350 | Computer Architecture and Organization | 3 |
| CIS 307 | Computer Organization and Programming 1B | 3 |
| CIS 362 | Introduction to Business Programming | 3 |
| CIS 500 | Analysis of Algorithms and Data Structures | 3 |
| CIS 505 | Introduction to Programming Languages | 3 |
| CIS 520 | Operating Systems I | 3 |
| CIS 540 | Software Engineering Project I | 3 |
| CIS 541 | Software Engineering Project II | 3 |
| CIS 560 | Introduction to Data Management Systems | 3 |
| CIS 562 | Business Data Processing | 3 |
| CIS 567 | Systems Analysis for Business | 3 |
| Technical electives (with advisor's approval): | | |
| B.A. Degree | ..... | 6 |
| B.S. Degree | ..... | 12 |

Required courses may not be taken under the A/Pass/F option.

Graduate study

The Department of Computing and Information Sciences offers graduate studies leading to master of science and doctor of philosophy degrees. A minimum of 30 semester hours of graduate course work is required for the master's degree, including an implementation course (CIS 605, 620, 630, 636, or 690), a computing theory course (CIS 675 or 770), the departmental seminar course (CIS 897), three breadth courses (CIS 705, 720, 730, 740, 761, or 671), and a course at the 800 level. A scholarly paper, directed project, or thesis is required to satisfy the program option.

The doctor of philosophy in computer science is offered jointly by Kansas State University and the University of Kansas. Students apply to one of the schools, but are formally admitted to both universities. Students working at KSU may take some courses at KU and are required to have a representative of KU as a member of their supervisory committee.

Admission to candidacy for the doctoral degree requires selection of a research supervisory committee; completion of written preliminary examinations in the areas of software systems, knowledge and information systems, and theory of computing; and completion of an oral exam. Completion of the doctoral degree requires 24 semester hours of course work beyond the master's degree of which 60% must be 800 level, a minimum of 30 hours of research, and presentation and defense of the dissertation. A total

of 90 hours is required. Courses at the 900 level are offered on a two-year rotation schedule.

Central areas of research at KSU include analysis of algorithms, artificial intelligence, data base systems, distributed systems, knowledge-based systems, operating systems and networks, programming languages and semantics, software engineering, and theory of concurrency.

Suggested course schedule for computer science majors

Freshman year

| | | |
|----------------------|---|---|
| Fall semester | | |
| ENGL 100 | English Composition I | 3 |
| SPCH 105 | Public Speaking 1A | 2 |
| or | | |
| SPCH 106 | Public Speaking I | 3 |
| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
| CIS 200 | Fundamentals of Computer Programming | 3 |
| CIS 203 | Fundamentals of Computer Programming Laboratory | 1 |
| PE 101 | Concepts in Physical Education ... | 1 |
| 14-15 | | |

Spring semester

| | | |
|---|--|---|
| ENGL 120 | English Composition II | 3 |
| EECE 241 | Introduction to Computer Engineering | 3 |
| CIS 300 | Algorithms and Data Structures ... | 3 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| Social science elective (first of four) | | |
| 16 | | |

Sophomore year

| | | |
|--|--|---|
| Fall semester | | |
| PHILO 220 | Symbolic Logic I | 3 |
| CIS 500 | Analysis of Algorithms and Data Structures | 3 |
| Natural science elective with laboratory (first of four) | | |
| Humanities elective (first of four) | | |
| Social science elective (second of four) | | |
| 16 | | |

Spring semester

| | | |
|---|--|---|
| CIS 350 | Computer Architecture and Organization | 3 |
| CIS 505 | Introduction to Programming Languages | 3 |
| MATH 510 | Discrete Mathematics | 3 |
| Elective (MATH 551) Applied Matrix Theory | | |
| Natural science elective with laboratory (second of four) | | |
| 16-17 | | |

Junior year

| | | |
|--|--|---|
| Fall semester | | |
| CIS 520 | Operating Systems I | 3 |
| CIS 570 | Theoretical Foundations of Computing | 3 |
| MATH 655 | Elementary Numerical Analysis ... or Numerical Computing | 3 |
| Humanities elective (second of four) | | |
| Natural science elective (third of four) | | |
| 15 | | |

Spring semester

| | | |
|---|---|---|
| CIS 560 | Introduction to Data Management Systems | 3 |
| STAT 410 | Statistics for Computer Science ... | 3 |
| Technical elective | | |
| Social science elective (third of four) | | |
| Elective | | |
| 3-4 | | |
| 15-16 | | |

Senior year**Fall semester**

| | | |
|---|---|--------------|
| CIS 540 | Software Engineering Project I | 3 |
| Technical elective | | 3 |
| Natural science elective (fourth of four) | | 3 |
| ENGL 516 | Written Communications for the Sciences | 3 |
| Elective | | 3-4 |
| | | 15-16 |

Spring semester

| | | |
|--|---------------------------------|-----------|
| CIS 541 | Software Engineering Project II | 3 |
| Humanities elective (third of four) | | 3 |
| Humanities elective (fourth of four) | | 3 |
| Social science elective (fourth of four) | | 3 |
| Technical elective | | 3 |
| | | 15 |

Suggested course schedule for information systems majors**Freshman year****Fall semester**

| | | |
|-------------------------------------|---|--------------|
| ENGL 100 | English Composition I | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| SPCH 106 | Public Speaking I | 3 |
| MATH 205 | General Calculus and Linear Algebra | 3 |
| CIS 200 | Fundamentals of Computer Programming | 3 |
| CIS 203 | Fundamentals of Computer Programming Laboratory | 1 |
| Humanities elective (first of four) | | 3 |
| | | 15-16 |

Spring semester

| | | |
|---|------------------------------------|-----------|
| ENGL 120 | English Composition II | 3 |
| CIS 300 | Algorithms and Data Structures | 3 |
| PE 101 | Concepts in Physical Education | 1 |
| Humanities elective (second of four) | | 3 |
| Social science elective (first of four) | | 3 |
| MATH 312 | Finite Applications of Mathematics | 3 |
| | | 16 |

Sophomore year**Fall semester**

| | | |
|--|--|-----------|
| EECE 241 | Introduction to Computer Engineering | 3 |
| CIS 500 | Analysis of Algorithms and Data Structures | 3 |
| CIS 362 | Introduction to Business Programming | 3 |
| Social science elective (second of four) | | 3 |
| Natural science elective with laboratory (first of four) | | 4 |
| | | 16 |

Spring semester

| | | |
|---|--|-----------|
| CIS 505 | Introduction to Programming Languages | 3 |
| CIS 350 | Computer Architecture and Organization | 3 |
| Natural science elective with laboratory (second of four) | | 4 |
| Technical elective | | 3 |
| STAT 320 | Elements of Statistics | 3 |
| | | 16 |

Junior year**Fall semester**

| | | |
|--|--------------------------|-----------|
| CIS 520 | Operating Systems I | 3 |
| Technical elective | | 3 |
| Natural science elective (third of four) | | 3 |
| Elective | | 3 |
| CIS 562 | Business Data Processing | 3 |
| | | 15 |

Spring semester

| | | |
|-------------------------------------|---|-----------|
| CIS 560 | Introduction to Data Management Systems | 3 |
| Humanities elective (third of four) | | 3 |
| Technical elective (CIS 407) | | 3 |
| Electives | | 6 |
| | | 15 |

Senior year**Fall semester**

| | | |
|---|--------------------------------|-----------|
| CIS 540 | Software Engineering Project I | 3 |
| Elective | | 3 |
| Social science elective (third of four) | | 3 |
| Natural science elective (fourth of four) | | 3 |
| Technical elective | | 3 |
| | | 15 |

Spring semester

| | | |
|--|---|-----------|
| CIS 541 | Software Engineering Project II | 3 |
| CIS 567 | Systems Analysis for Business | 3 |
| Humanities elective (fourth of four) | | 3 |
| Social science elective (fourth of four) | | 3 |
| ENGL 516 | Written Communications for the Sciences | 3 |
| | | 15 |

Courses in computer science**Undergraduate credit**

CIS 110. Introduction to Personal Computing. (3) I, II, S. Introduction to the use of computers and application software including word processing, spread sheets, graphics, database management, communications, and problem solving; issues of ethical use of computers. Pr.: MATH 100. CIS-110-0-0701

CIS 112. Advanced Personal Computing. (3) I, II. Advanced features of application software for personal computers, including batch files, configuration and maintenance of hardware and software, macros for application software, and sharing of data and programs. Individualized problems. Two hours lec. and four hours lab a week. Pr.: B or better in CIS 110 or permission of instructor. CIS-112-0-0701

CIS 190. Undergraduate Seminar in Computing and Information Sciences. (1) Topics of special interest in computing and information sciences. CIS-190-0-0701

CIS 200. Fundamentals of Computer Programming. (3) I, II, S. Abstraction and problem solving, concept of algorithm and algorithm efficiency, control structures, procedures, arrays and array processing; introduction to a procedural language, and use of that language in selected applications. Pr.: MATH 100; conc. in CIS 203 is required. CIS-200-0-0704

CIS 203. Fundamentals of Computer Programming Laboratory. (Var.) I, II, S. Programming instruction and assistance in the procedural language taught in CIS 200. May be taken for 0 or 1 credit hour. Conc. enrollment in CIS 200 required. CIS-203-0-0704

CIS 204. FORTRAN Language Laboratory. (1) I, II. Fundamentals of programming in FORTRAN; applications. Three hours lab a week. Pr.: CIS 200. CIS-204-1-0-0704

CIS 206. BASIC Language Laboratory. (1) I, II. Fundamentals of programming in BASIC; applications. Three hours lab a week. Pr.: CIS 200. CIS-206-1-0-0704

CIS 208. C Language Laboratory. (1) I, II. Fundamentals of programming in C; applications. Three hours lab a week. Pr.: CIS 200. CIS-208-0-0704

CIS 300. Algorithms and Data Structures. (3) I, II, S. Structured and modular design and implementation; arrays, records, sets, pointers, files, strings; defined types, stacks, queues; searching, hashing, sorting; recursion; procedure specifications, exceptions, testing, debugging. Pr.: Knowledge of a strongly typed programming language. CIS-300-1-0-0704

CIS 306. Operating Systems Laboratory. (3) Advanced programming laboratory for experience in O/S 360/370, job control language, utilities, and access methods. Pr.: CIS 305 or 307. CIS-306-0-0704

CIS 350. Computer Architecture and Organization. (3) I, II. Introduction to computer architecture as the interface between hardware and software. Register-transfer CPU, memory bus, and input/output structures. Assembler language as the programmer's interface to the bare machine and to the extended machine (including system services). Instruction sequencing, addressing mechanisms, procedure calls,

and simple input/output operations. Pr.: EECE 241 and CIS 300. CIS-350-0-0704

CIS 362. Introduction to Business Programming. (3) I, II. An introduction to basic business programming techniques including file manipulation operations and sorting. The COBOL language will be used as an implementation tool. Pr.: CIS 200. CIS-362-1-6-0723

CIS 397. Honors Seminar in Computer Science. (1-3) CIS-397-3-0701

CIS 407. Assembler Language Programming. (3) Programming in assembler language under mainframe environment such as IBM, CMS, and VM. Introduction to system services such as file operations and channel programming. Pr.: EECE 241, and CIS 350. CIS-407-0-0704

CIS 490. Special Topics in Computer Science. (2-4) Current topics in computer science. Pr.: Prerequisite varies with the announced topic. CIS-490-0-0701

CIS 492. Computers and Society. (1-3) A study of the impact of computers and associated technologies on society, including such topics as ethics of computer use, computer fraud, protection of privacy; legal, moral, and public policy-making responsibility of computer professionals. Pr.: Junior standing and conc. enrollment in PHILO 492; CIS 520. CIS-492-0-0701

CIS 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. CIS-499-0-0701

Undergraduate and graduate credit in minor field

CIS 500. Analysis of Algorithms and Data Structure. (3) I. Analysis of data structures and computer algorithms for trees, lists, graphs, sets. Measures of performance and complexity of algorithms and structures. Pr.: CIS 300. CIS-500-0-0701

CIS 505. Introduction to Programming Languages. (3) II. History, processors, programming environments; types, scope and extent, abstraction mechanisms, exceptions, and concurrency; functional and object-oriented languages; formal syntax and semantics; structure of compilers for block-structured languages. Pr.: CIS 300. CIS-505-0-0701

CIS 520. Operating Systems I. (3) I. Basic operating systems concepts and services: interrupt processing, processes, concurrency, deadlock, resource scheduling and system structure; resource management: real and virtual storage, input/output systems, disk scheduling and file systems; design and construction of concurrent programs. Pr.: CIS 305 or 307 or EECE 631; and CIS 300. CIS-520-0-0701

CIS 521. Real-Time Programming Laboratory. (3) I. Project-oriented introduction to asynchronous processes and related system software: device drivers, event-driven operations, hierarchical and time-sliced process scheduling, spooling operations, interjob and intermachine communications. Projects will be built on a single-use environment. Pr.: EECE 241 and CIS 350, conc.: CIS 520. CIS-521-0-0703

CIS 525. Telecommunications and Data Communication Systems. (3) Study of the architecture and data systems level of data transport between cooperating autonomous systems including the management and organizational impact issues. Pr.: CIS 520 and 560. CIS-525-0-0701

CIS 535. Introduction to Computer-Based Knowledge Systems. (3) I. Introduction to the application of artificial intelligence concepts to solving knowledge-dependent tasks. Review of knowledge-representation ideas. Survey of expert system design. Introduction to existing knowledge-based tools available on personal computers. Development of an intelligent system. Pr.: CIS 200. CIS-535-0-0701

CIS 540. Software Engineering Project I. (3) I. Current practices of software development, requirements, design, prototyping, measures, and evaluation. Specification, design, and prototyping of a software system. Pr.: CIS 500. CIS-540-0-0704

CIS 541. Software Engineering Project II. (3) II. Final implementation, integration, and testing of a software system. Introduction to configuration management, project management, and software maintenance. Pr.: CIS 500; CIS 540 (which must be taken in the preceding semester). CIS-541-0-0704

CIS 560. Introduction to Data Management Systems. (3) II. Representation of information as data, storage and manipulation of large amounts of data, logical data models, data storage techniques, data retrieval, integrity, and security. Pr.: CIS 500. CIS-560-0-0701

CIS 562. Business Data Processing. (3) I. Advanced topics in COBOL with application to typical business data processing systems such as payrolls, file systems, inventories, and management information systems. Pr.: CIS 362. CIS-562-0-0703

CIS 567. Systems Analysis for Business. (3) II. Manual, semiautomatic, and automatic data processing systems; accounting concepts, data processing implications; organization of sequential and direct-access files; checking and control techniques. Students will study business applications and recommend data processing systems. Pr.: CIS 500. CIS-567-0-0703

CIS 570. Theoretical Foundations of Computing. (3) I. Specification and correctness of algorithms, formal languages and automata, introduction to computability, computational complexity of algorithms. Pr.: PHIL 220, MATH 510, CIS 300. CIS-570-0-0702

CIS 580. Numerical Computing. (3) I. Introduction to numerical algorithms fundamental to scientific computer work, including elementary discussion of error, roots of equations, interpolation, systems of equations, quadrature, and introduction to methods for solution of ordinary differential equations. Pr.: CIS 300 and MATH 221 and 551. CIS-580-0-0701

CIS 591. Computer Science Applications. (3) I, II, S. Programming, program libraries, and design of algorithms. For students with minimal background in computer science. Not for credit by CIS majors. Pr.: Graduate standing in student's own area and knowledge of at least one procedural programming language. CIS-591-0-0704

Undergraduate and graduate credit

CIS 600. Microcomputer Software. (3) I. Contemporary software packages for microcomputers, including graphics, word processing, spreadsheets, desktop publishing. Events, resources, and the graphical user interface. Student programming project. Pr.: CIS 300. CIS-600-0-0701

CIS 605. Programming Languages Practicum. (3) II. Concepts and problems in modern programming languages; implementation studies. Current programming paradigms. Conc. enrollment in CIS 505 required. CIS-605-0-0701

CIS 606. Translator Design I. (3) Compilers and interpreters, including description of languages, finite state scanners, LL(1) parsing, symbol tables, syntax-directed semantics, simple code generation. Constructing a simple PASCAL compiler. Pr.: CIS 300, 500, 505. CIS-606-1-0-0701

CIS 620. Operating System Practices. (3) Structure and functions of modern operating systems. Emphasis on reading and modifying the source code of a working operating system. This includes memory management, input/output, process management, file systems, and network interconnection software construction. Pr.: CIS 500 and 520. CIS-620-0-0704

CIS 630. AI Programming Techniques. (3) I. Introduction to tools, techniques, and issues in artificial intelligence programming. Fundamentals of function-, logic-, and object-oriented programming styles. Implementation projects. Pr.: CIS 505. CIS-630-0-0701

CIS 636. Introduction to Computer Graphics. (3) I, II. Devices and software for graphics display and user interaction, development of software for direct graphic manipulation applications. Cross-listed with EECE 636. Pr.: CIS 300. CIS-636-0-0704

CIS 671. Programming Science. (3) Use of formal logic for specification and verification of programs; abstractions and assertions for data structures, procedures, packages, loops, and tasks. Pr.: CIS 505, and either CIS 370 or PHILO 220. CIS-671-0-0702

CIS 675. Analysis of Algorithms. (3) Study and application of techniques and procedures used in the analysis of algorithms including the worst and average cases of both time and space. Study of the P and NP classes. Pr.: CIS 500 and MATH 220. CIS-675-0-0701

CIS 690. Implementation Projects. (3) I, II, S. The department will suggest various design or implementation projects for individuals or groups in areas such as translators, interpreters, microprogramming, minicomputer operating systems, graphics, numerical software, etc. Pr.: Junior standing. CIS-690-3-0799

CIS 697. Seminar in Computer Science. (1-3) Pr.: Junior standing. CIS-697-3-0701

CIS 705. Programming Language Design. (3) Fundamental design principles: abstraction, parameterization, qualification. Lambda-calculus as a metalanguage for design and analysis. The role of data typing, predicate calculus-based typing. Intuitionistic Type Theory. Pr.: CIS 605 or equivalent experience. CIS-705-0-0701

CIS 710. Computer Simulation Experiments. (3) Principles of digital computer simulations; discrete and continuous simulation method, statistics of simulations; implementations. Pr.: CIS 300. CIS-710-0-0701

CIS 720. Operating Systems II. (3) Design of operating systems, concurrent programs, scheduling, memory management, protection, file systems, methods, and languages for operating system development. Pr.: CIS 520 and 500. CIS-720-0-0701

CIS 725. Computer Networks. (3) Data communications; network topology design; design and implementation of point to point network protocols; local area networks; interconnection of networks; network-based applications. Pr.: CIS 520. CIS-725-0-0701

CIS 730. Principles of Artificial Intelligence. (3) Introduction to the fundamental concepts and techniques of AI: problem solving, search and planning, knowledge representation and qualitative reasoning, expert systems, natural language processing and cognitive modeling, computer vision, and machine learning. Pr.: CIS 630, 671. CIS-730-0-0701

CIS 736. Computer Graphics. (3) Topics in computer representation and display of images and graphic interaction. Pr.: CIS 636 or EECE 636. CIS-736-0-0702

CIS 740. Software Engineering. (3) Software life cycle, requirements, specifications, design, validation, measures, and maintenance. Pr.: CIS 540. CIS-740-0-0701

CIS 745. Software Development Management. (3) Development models, cost estimation, management of programmer teams, acceptance criteria, reliability estimation, development standards. Pr.: CIS 541. CIS-745-0-0701

CIS 750. Advanced Computer Architecture Experiments. (3) Characteristics of various computers including those with execution support of multiprocessing, multiprogramming, microprogrammable, high-level language, stack processing, and communication architectures. Two hours lec. and three hours lab a week. Pr.: CIS 350 or 407. CIS-750-0-0701

CIS 761. Data Base Management Systems. (3) Data models and languages, hierarchical, network, relational systems; implementation and operational requirements; programming projects using data base management systems. Pr.: CIS 560. CIS-761-0-0702

CIS 762. Office Automation. (3) Characteristics of information work; modelling systems for characterizing aspects of office environment; form-based systems; office automation and description languages; ergonomics; local area networks and tools used in the automation of offices. Pr.: CIS 560. CIS-762-0-0702

CIS 770. Formal Language Theory. (3) Regular languages, finite automata, context-free languages, pushdown automata, context-sensitive languages, linear bounded automata, recursively enumerable languages, Turing machines. Pr.: CIS 570. CIS-770-0-0701

CIS 780. Numerical Solution of Ordinary Differential Equations. (2) Computer algorithms and techniques for solving ordinary differential equations; programming exercises on the digital computer. Pr.: One CIS language lab and MATH 555 or CIS 580 and MATH 240 plus conc. enrollment in MATH 780. CIS-780-0-0701

CIS 785. Numerical Solution of Partial Differential Equations. (2) Computer algorithms and techniques for solving partial differential equations; programming exercises on the digital computer. Pr.: CIS 780 and MATH 780 plus conc. enrollment in MATH 785. CIS-785-0-0701

CIS 791. Intensive Computer Science: Concepts. (1-3) I, II, S. Principles of data structure, assembly language programming, structure of operating systems and programming languages. Intended for entering graduate students in computer science. Pr.: CIS 300. CIS-791-0-0704

CIS 798. Topics in Computer Science. (Var.) I, II, S. Pr.: Prerequisite varies with the announced topic. CIS-798-3-0701

Graduate credit

CIS 801. Translator Design II. (3) LR parsing, storage allocation, code generation, data flow optimization, compiler generators. Pr.: CIS 606. CIS-801-0-0701

CIS 806. Semantics of Programming Languages. (3) Introduction to formal semantics description methods for programming languages; comparison of operational, denotational, algebraic, and axiomatic methods; analysis of relationship of formal semantics definitions to computer implementations. Pr.: CIS 671. CIS-806-0-0701

CIS 807. Algebraic Semantics. (3) Fundamentals of algebraic specification techniques for abstract data types and software systems. Equational specifications, algebras, initial algebra semantics, characterization of equational classes, the equational calculus, term rewriting, correctness and extension of specifications. Pr.: CIS 671. CIS-807-0-0701

CIS 820. Introduction to Operating Systems Theory. (3) Theoretical treatment of process synchronization, multiprocessors, resource allocation, scheduling theory, evaluation techniques for hierarchical memory and machines. Pr.: CIS 720. CIS-820-0-0705

CIS 825. Concurrent and Distributed Computing Systems. (3) The architecture, object access, process synchronization, protection and security, operating system, and language issues in concurrent and distributed computing systems. Design and implementation of both concurrent and distributed computing systems. Pr.: CIS 720 and 725. CIS-825-0-0705

CIS 830. Current Topics in Artificial Intelligence. (3) Advanced techniques and new ideas in artificial intelligence. Includes applications and case studies of artificial intelligence in action. Pr.: CIS 730. CIS-830-0-0701

CIS 840. Advanced Topics in Software Engineering. (3) Studies of one or more of the following topics: AI techniques in software engineering, formal specification methods and systems, software measures, software testing, programming environments. Topics will be announced. May be repeated for credit. Pr.: CIS 671 and 740. CIS-840-0-0704

CIS 860. Distributed Data Bases. (3) Investigation of topics such as backend machines, redundancy, security, concurrency control, recovery, performance models, data distribution models, managerial considerations, and implementation issues. Pr.: CIS 761. CIS-860-0-0702

CIS 870. Theory of Computability. (3) Formal models for computability; universal programs; Church's thesis; unsolvable problems and reducibilities; partial recursive functions; recursive and recursively enumerable sets; s-m-n theorem and the recursion theorem. Pr.: CIS 770. CIS-870-0-0701

CIS 890. Special Topics in Computer Science. (2-4) Topics of the current state-of-the-art of computer science. Pr.: Prerequisite varies with the announced topic. CIS-890-0-0701

CIS 897. Seminar in Computer Science. (1-3) I, II, S. Required for graduate students in computer science. Pr.: Full graduate standing in CIS. CIS-897-3-0701

CIS 898. Master's Report in CIS. (1-2) I, II, S. Pr.: CIS 897. CIS-898-3-0701

CIS 899. Research in Computer Science. (1-6) I, II, S. Pr.: CIS 897. CIS-899-4-0701

CIS 901. Topics in Translator Design. (3) On sufficient demand, in alternate years. Topics involving incremental, extensible, conversational compilers; program development systems, portability and validation of compilers; compiler generators. Pr.: CIS 801. CIS-901-0-0701

CIS 905. Theory of Programming Languages. (3) In alternate years. Formal definition languages; operational and formal semantic models; equivalence of semantic models; formal properties of programming languages. Pr.: CIS 806. CIS-905-0-0701

CIS 920. Contemporary Concepts in Programming Systems. (3) Theoretical analysis of deadlock in multiprocess systems, detection and prevention; theoretical properties of virtual memory, the working set model; theory of resource allocation, scheduling theory. Pr.: CIS 720 and 806 and STAT 510. CIS-920-0-0701

CIS 926. Computation Structures. (3) In alternate years. Petri nets, flowgraph schemata, dataflow models; relationships between abstract computational models and hardware models and programming languages. Pr.: CIS 671. CIS-926-0-0701

CIS 930. Expert Systems. (3) Advanced theory and techniques in the development of expert systems. Focuses on knowledge acquisition and knowledge organization used in expert systems. Includes design, implementation, and evaluation of an expert system. Pr.: CIS 830. CIS-930-0-0701

CIS 940. Research Topics in Software Engineering. (3) Research on one of the topics in CIS 840. May be repeated for credit. Pr.: CIS 840. CIS-940-0-0701

CIS 960. Theory of Data Base Systems. (3) In alternate years. Advanced topics in data base systems including distributed data bases, integrity, security, normalization, data base machines performance models, query languages. Pr.: CIS 840. CIS-960-0-0702

CIS 990. Research Topics. (2-3) Study of current topics in computer science. Pr.: Consent of instructor. CIS-990-0-0701

CIS 999. Research in Computer Science. (Var.) I, II, S. Pr.: CIS 897. CIS-999-4-0701

Economics is concerned with the principles governing the production and distribution of goods and services, the principles guiding the best use of resources—land, labor, and capital—and factors causing business prosperity and depression, economic growth, inflation, and deflation. Students may pursue specialized study in economic theory, econometrics, economic development, economic fluctuations, economic systems, history of economic thought, industrial organization, international trade, labor economics, managerial economics, mathematical economics, monetary theory and policy, public finance, regional economics, and transportation economics.

A student majoring in economics may be enrolled for either the bachelor of arts or the bachelor of science degree.

Students who transfer two years of work to Kansas State University from a community college and who plan to major in economics should have completed ECON 110, Economics I, and ECON 120, Economics II, or equivalent courses, and MATH 100, College Algebra.

Undergraduate study

Requirements for an economics major for either the B.A. or B.S. degree are:

| | | |
|----------|-----------------------------|---|
| ECON 110 | Economics I | 3 |
| ECON 120 | Economics II | 3 |
| ECON 510 | Intermediate Macroeconomics | 3 |
| ECON 520 | Intermediate Microeconomics | 3 |
| ECON 580 | Senior Seminar in Economics | 3 |

Five additional economics department courses, 500 level or above, in at least four branches of economics (except ECON 505 and 506).

Any introductory statistics course: STAT 320, 330, 340, 350, 702, 703.

Mathematics: either MATH 205, General Calculus and Linear Algebra, or MATH 220, Analytic Geometry and Calculus I.

Courses taken Credit/No Credit may not be used to fulfill these requirements.

Students interested in graduate study in economics should take two or more courses in calculus and additional courses in matrix algebra and statistics. Early counsel with an advisor is also recommended.

Secondary education certification

A student majoring in economics may also prepare for teacher certification at the secondary level. This program leads to the bachelor of science degree. The sequence of courses should be planned in cooperation with the student's advisors in both economics and education so that the requirements of secondary education are met.

Industrial relations and labor studies.

Students planning to work in the industrial relations or manpower development utilization field should become acquainted with the economic, political, and social aspects of labor-management relations and manpower studies by taking the following

courses as part of either a terminal university program or a foundation for graduate study:

| | | |
|-----------|-----------------------------------|---|
| ECON 620 | Labor Economics | 3 |
| ECON 627 | Contemporary Labor Problems | 3 |
| SOCIO 747 | Sociology of Work | 3 |
| POLSC 608 | Public Personnel Administration | 3 |
| MANGT 530 | Industrial and Labor Relations | 3 |
| MANGT 531 | Personnel and Wage Administration | 3 |
| MANGT 630 | Labor Relations Law | 3 |
| MANGT 631 | Collective Bargaining | 3 |
| MANGT 632 | Industrial Dispute Settlement | 3 |

Accelerated undergraduate and graduate programs

A student who begins graduate work after completing the B.A. or B.S. degree generally requires more than one year to complete work for a master's degree. However, a five-year program leading to a B.A. or B.S. in economics at the end of four years and a master of arts in economics at the end of five years is available for promising undergraduate students. Students who have completed the sophomore year and have outstanding scholastic records (GPA 3.2 or higher) are invited to join the program. Each student, in consultation with a faculty advisor, will plan an individualized program of study which meets requirements for the B.A. or B.S. and the M.A. degrees. Features of the program include integrated planning, participation in research as an undergraduate, and enrollment in graduate-level courses in the senior year. Students participating in the program will be considered for financial assistance in the form of scholarships, fellowships, research assistantships, and part-time work.

Graduate study

Graduate study leading to the degrees master of arts and doctor of philosophy is offered in economics. Fields of study are economic theory, econometrics, economic development, economic fluctuations, history of economic thought, industrial economics, international trade, labor economics, monetary and fiscal policy, public finance, regional economics, and transportation economics.

Graduate degrees are essential for careers as professional economists in higher education, business, or government. Graduate study also is valuable training for certain executive and research positions in business and government and for teaching social science in secondary schools.

Prerequisite to major graduate study in economics is completion of an undergraduate curriculum equivalent to that required of undergraduate majors in economics at Kansas State University. Students must demonstrate reasonable proficiency in mathematics and statistics.

Opportunities for advanced study are enhanced by close contacts with the agricultural economics department, with

Economics

Victor J. Tremblay,* Head

Professors Babcock,* Emerson,* Nafziger,* Ragan,* and Thomas;* Associate Professors Akkina,* Gormely,* Oldfather,* Olson,* and V. Tremblay;* Assistant Professors Chang,* Megna,* McNulty,* C. Tremblay,* and Washburn;* Instructors Higham,* Hula,* and Trenary; Emeriti: Professors Bagley,* Chalmers,* and Nordin.*

the College of Business Administration, with the agricultural and engineering experiment stations, and with the various state agencies.

Courses in economics Undergraduate credit

ECON 110. Economics I. (3) I, II, S. Basic facts, principles, and problems of economics; introductory principles of resource allocation; determination of the level of employment, output, price level; the monetary and banking system; institutions of the American economy; problems of labor, economic instability, depressions, inflation, economic growth; principles of economic development; other economic systems. ECON-110-0-2204

ECON 111. Economics I Honors. (3) I. Course description same as ECON 110. (3) I, II, S. Pr.: Open to students in honors program. ECON-111-0-2204

ECON 120. Economics II. (3) I, II, S. Continuation of Economics I. Basic facts, principles, and problems of economics including study of the determination of prices by supply and demand, the determination of wages, rent, interest, and profit; theory of the firm; problems of monopoly, agriculture, taxation; international economic relations. ECON-120-0-2204

ECON 399. Honors Seminar in Economics. (3) For sophomores in honors program—scheduled irregularly. Readings and discussions. Open to students in the honors program not majoring in economics. ECON-399-0-2204

ECON 499. Seniors Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. ECON-499-0-2204

Undergraduate and graduate credit in minor field

ECON 505. Introduction to the Civilization of South Asia I. (3) I. Interdisciplinary survey of the development of civilization in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan; geographical and demographic context, philosophical and social concepts, economic, social and political institutions, literature and historical movements. Same as HIST 505, POLSC 505, SOCIO 505, ANTH 505. ECON-505-0-2204

ECON 506. Introduction to the Civilization of South Asia II. (3) II. Interdisciplinary survey of recent and contemporary civilization in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including recent history, current economy, religion, culture, languages and literature, geography, social and political structures and ideas. Same as HIST 506, POLSC 506, SOCIO 506, ANTH 506. ECON-506-0-2204

ECON 510. Intermediate Macroeconomics. (3) I, II, S. An examination of the behavior of the economy as a whole, including an analysis of the national income account, consumption, investment, money, interest, the price level, the level of employment, monetary and fiscal policy, and economic growth. Pr.: ECON 110; ECON 120 or AGECE 100. ECON-510-0-2204

ECON 520. Intermediate Microeconomics. (3) I, II, some S. An examination of the theories of consumer behavior and demand, and the theories of production, cost, and supply. The determination of product prices and output in various market structures, and an analysis of factor pricing. Introduction to welfare economics. Pr.: ECON 120. ECON-520-0-2204

ECON 530. Money and Banking. (3) I, II, S. Nature, principles, and functions of money; development and operation of financial institutions in the American monetary system, with emphasis on processes, problems, and policies of commercial banks in the United States. Pr.: ECON 110. ECON-530-0-2204

ECON 532. Fiscal Operation of State and Local Government. (3) I. Designed for students who plan careers related to state or local government. Selected topics in state and local taxation and expenditure. Pr.: ECON 110 and permission of instructor. ECON-532-0-2204

ECON 540. Managerial Economics. (3) II. Microeconomic topics applicable to understanding and analyzing firm behavior: optimization, demand, estimation, production, and cost theory. Applications to business problems. Pr.: ECON 120, an introductory-level statistics course, and MATH 205. ECON-540-0-2204

ECON 555. Urban and Regional Economics. (3) I, II. An examination of the determinants of the economic performance of urban and regional economies, including theory, problems, and policy. Pr.: ECON 120. ECON-555-0-2204

ECON 580. Senior Seminar in Economics. (3) I. Topics for class discussion include history of economic thought, research methods in economics, and current economic issues. Students will prepare and present papers written with faculty guidance. Required of all economics majors; open to others with permission of instructor. Pr.: ECON 510 and ECON 520. ECON-580-0-2204

Undergraduate and graduate credit

ECON 620. Labor Economics. (3) I. Economics of the labor market—labor force composition and trends, structure and characteristics of labor markets, wages, employment, and unemployment; economics of trade unions; current issues. Pr.: ECON 120 or consent of instructor. ECON-620-0-2204

ECON 627. Contemporary Labor Problems. (3) II. Emphasis on current research and public policies dealing with such matters as full employment, poverty, discrimination, social security, unemployment insurance, health care, minimum wages, training, and education. Pr.: ECON 620 or consent of instructor. ECON-627-0-2204

ECON 631. Principles of Transportation. (3) II. The historical development and economic importance of rail, motor, air, water, and pipeline transportation in the United States—routes, services, rates, public regulation. Pr.: ECON 110; ECON 120 or AGECE 100. ECON-631-0-2204

ECON 633. Public Finance. (3) II. Course seeks answers to questions such as: Which goods should be provided by the private sector and which by the public sector (government)? With what criteria are public expenditures evaluated? What is an equitable and efficient tax system? Who bears the tax burden? What aspects of existing taxes need reform? Pr.: ECON 110; ECON 120 or AGECE 100. ECON-633-0-2204

ECON 636. Capitalism and Socialism. (3) II. A survey of Marxian economics, major perspectives on U.S. capitalism, market and self-governing socialism, and the Soviet, Chinese, and other communist economies. Pr.: ECON 110. ECON-636-0-2204

ECON 640. Industrial Organization and Public Policy. (3) II. An examination of measures and determinants of industrial concentration, and an analysis of market structure, conduct, and performance, and policies related to performance. Pr.: ECON 120. ECON-640-0-2204

ECON 681. International Trade. (3) I, some S. Principles of international trade and finance, including production, exchange, commercial policy, resource movements, balance of payments, foreign currency markets, and policies for internal and external balance. Pr.: ECON 110; ECON 120 or AGECE 100. ECON-681-0-2204

ECON 682. Economics of Underdeveloped Countries. (3) I, some S. Factors influencing the economic modernization of the less-developed countries. Emphasis on capital formation, investment allocation, structural transformation, population growth, development planning, and the international economics of development. Pr.: ECON 110. ECON-682-0-2204

ECON 686. Business Fluctuations and Forecasting. (3) I. Types of business fluctuations; measurement of business cycles; theories of the causes of business cycles; proposals for stabilizing business activity; techniques of forecasting business activity. Pr.: ECON 110; ECON 120 or AGECE 100. ECON-686-0-2204

ECON 690. Monetary, Credit, and Fiscal Policies. (3) II. Goals of aggregative economic policy, conflicts among goals, and measures to resolve conflicts; money markets; targets of central bank control; the relative strength of monetary and fiscal policies; rational expectations hypothesis and policy ineffectiveness debate; term structure of interest rates. Pr.: ECON 530. ECON-690-0-2204

ECON 699. Seminar in Economics. (1-3) On sufficient demand. Seminars of special interest will be offered on demand. Pr.: ECON 120. ECON-699-0-2204

ECON 720. Microeconomic Theory. (3) I. Demand, cost, and production theories; price and output determination in different market structures; the theory of factor market pricing; an introduction to general equilibrium and welfare analysis. Pr.: ECON 520; MATH 205 or MATH 220. ECON-720-0-2204

ECON 730. Introduction to Econometrics. (3) II, some S. Analytical and quantitative methods used in economics. Applications to specific problems. Pr.: MATH 220 or 205; STAT 550 or both STAT 510 and 511. ECON-730-0-2204

ECON 735. Mathematical Economics. (3) I. Application of mathematical tools of concrete problems in micro- and macro-economics; mathematical treatment of models of consumption, production, market equilibrium, and aggregate growth. Pr.: ECON 520, MATH 205 or 220, or consent of instructor. ECON-735-0-2204

ECON 795. Problems in Economics. (Var.) I, II, S. Advanced individual study is offered in money and banking, public finance, general economics, international trade, labor relations, transportation. Pr.: Background of courses needed for problem undertaken. ECON-795-3-2204

Graduate credit

ECON 801. Topics in Monetary Theory. (3) I, in even years. Emphasis on recent literature of monetary economics; Federal Reserve control of the money stock; the demand for money; money and economic activity; monetary targets and indicators. Pr.: ECON 510 and ECON 530. ECON-801-0-2204

ECON 805. Income and Employment Theory I. (3) II. Determination of national income, employment, and the price level. The theories of J. M. Keynes are emphasized along with selected post-Keynesian developments in theories of consumption, investment, money, the interest rate, and the price level. Pr.: ECON 120 and 510 or consent of instructor. ECON-805-0-2204

ECON 810. History of Economic Thought. (3) I. Development of economic ideas and doctrines and the relation of these to conditions existing when they were formulated. Pr.: ECON 110. ECON-810-0-2204

ECON 823. Advanced International Economics. (3) II. Theoretical and policy issues related to the international monetary system, capital movements, exchange rate systems, the U.S. balance of payments, and trade of underdeveloped countries. Pr.: ECON 681 or consent of instructor. ECON-823-0-2204

ECON 832. Public Sector Analysis. (3) II, in odd years. Conditions for economic efficiency in the public sector; public good production functions; nonmarket decision making; rationale for public sector growth; systems analysis, cost-benefit and related techniques of allocating public goods. Pr.: ECON 633 and 815. ECON-832-0-2204

ECON 840. Managerial Economics. (3) I. Economic analysis of production, cost, and demand functions. Application of economic models to managerial decision making. Pr.: ECON 520, MATH 205, and one course in statistics with a prerequisite in the same department. ECON-840-0-2204

ECON 860. Growth and Development Theories. (3) II. Advanced theories of economic growth and development models. Topics include optimum savings, allocations of investment, investment criteria, technical change, programming models, and alternative designs for development policies. Pr.: ECON 682 or consent of instructor. ECON-860-0-2204

ECON 898. Master's Report in Economics. ECON-898-4-2204

ECON 899. Master's Research in Economics. ECON-899-4-2204

ECON 905. Income and Employment Theory II. (3) I. Aggregative econometric models; dynamic analysis—growth models, the stability of macroeconomic systems. Other current developments in macroeconomic theory. Pr.: ECON 805 or consent of instructor. ECON-905-0-2204

ECON 920. Labor Economics Seminar. (3) I. A critical analysis of wage theories, collective bargaining, and unemployment problems. Pr.: ECON 620 or consent of instructor. ECON-920-0-2204

ECON 925. Location of Economic Activities. (3) II. An examination of the theory of location including central place theory, location of the individual producer, industrial location patterns, and urban land-use models. Also includes application of theoretical models to current urban problems. ECON-925-0-2204

ECON 935. Econometric Methods. (3) I. Quantitative methods of research used in economics. Pr.: ECON 730 or consent of instructor. ECON-935-0-2204

ECON 940. Advanced Microeconomic Theory I. (3) II. An examination of demand, production, and cost theories; a discussion of duality theory and the application of the Le Chatelier principle; an analysis of price and output determination in different market structures. Pr.: ECON 520; ECON 735. ECON-940-0-2204

ECON 945. Advanced Microeconomic Theory II. (3) I. A study of advanced topics in economic theory, including general equilibrium theory, welfare economics, and risk and uncertainty. Pr.: ECON 940. ECON-945-0-2204

ECON 955. Theory and Methods of Regional Economic Analysis. (3) I. A consideration of differences in regional and urban growth; comparison of alternative growth theories; methods of analyzing regional economics such as input-output analysis, linear programming, industrial complex, and spatial interaction models. Pr.: ECON 925 or consent of instructor. ECON-955-0-2204

ECON 999. Ph.D. Research in Economics. ECON-999-4-2204

English

Robert M. Grindell,* Head

Professors Bixler,* Dees,* Hedrick,* Holden,* Johnston,* Keiser,* McCarthy,* McGhee,* Nyberg,* Rees,* M. Schneider,* D. Stewart,* and L. Warren;* Associate Professors Brondell,* Cohen, Conrow,* Donnelly,* Gillespie, Grindell,* Hall,* Heller,* T. Murray,* Nelson,* and H. Schneider; Assistant Professors Dodd, Rodgers, Smit,* and Susina; Instructors Baker, Bussing, J. Clark, M. Clark, Cliff, Dillon, Frazier, Friedmann, Hajda, Kolonosky, Kremer, Mosher, D. Murray, Ransom, Roper, Seltzer, Shepherd, P. Stewart, A. Warren, Wheatley; Emeriti: Professors Davis, Eitner, Higginson, Moses, Noonan, and Rogerson; Associate Professors Adams, Ansdell, Jones, and Koch; Assistant Professor Glenn; Instructors Bergman, Pelischek, Roachat, and Vance.

Undergraduate study

Students may elect to earn a B.A. in the department through a course of study based on one of the following three patterns.

Literature track

Core courses (9 hours):

ENGL 252 Introduction to Literary Studies . . . 3
One Shakespeare course (ENGL 350, 716,
or 717) 3
One language course (ENGL 490, 530,
600, or 790) 3

One sequence of survey courses (6 hours):

ENGL 361 British Survey I 3
and
ENGL 362 British Survey II 3
or
ENGL 381 American Survey I 3
and
ENGL 382 American Survey II 3

Four 3-credit courses from 600-799 offerings (12 hours)

Note: Students submitting American survey sequence must take at least one 600-799 level course in British literature; students submitting British surveys must take at least one 600-799 level course in American literature.

A student must take at least 6 hours of American literature in the total program.

Two electives (6 hours):

Two courses at the 500 level or above 6
or
One course at the 500 level or above 3
and

One of the following:

ENGL 310 Introduction to Fiction 3
ENGL 320 Introduction to the Short Story . . . 3
ENGL 340 Introduction to Poetry 3
ENGL 345 Introduction to Drama 3
ENGL 230 Humanities: Classical Cultures . . . 3
ENGL 231 Humanities: Medieval and
Renaissance 3
ENGL 233 Humanities: Baroque and
Enlightenment 3
ENGL 234 Humanities: Modern 3
ENGL 492 Humanities: Seminar 3

A third survey course:

ENGL 361, 362, 381, or 382 (see above) 3

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Literature and creative writing track

Core courses (9 hours)

See literature track.

Two survey courses (6 hours):

ENGL 361, 362, 381, or 382

Two 3-credit courses in literature and English language from the 600-799 offerings (6 hours)

Note: Students submitting two American survey courses must take at least one 600-799 level course in British literature, and students submitting two British survey courses must take at least one 600-799 level course in American literature.

A student must take at least 6 hours of American literature in the total program.

ENGL 500 Introduction to Creative Writing . . . 3

Three 3-credit courses in writing at the advanced level, in at least two genres (9 hours)

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Literature with teaching certification track Required (15 hours):

ENGL 252 Introduction to Literary Studies . . . 3
ENGL 400 Advanced Composition 3
ENGL 490 Development of the English
Language 3
ENGL 530 Modern English Grammar 3
ENGL 545 Literature for Adolescents 3

One Shakespeare course:

ENGL 350 Introduction to Shakespear 3
or
ENGL 716 Shakespeare: Comedies and
Histories 3
or
ENGL 717 Shakespeare: Tragedies and
Romances 3

Two of the following (6 hours) 6

ENGL 361 British Survey I
ENGL 362 British Survey II
ENGL 381 American Survey I
ENGL 382 American Survey II

Literature electives at 600 level and above 9
A world literature course 3
Composition elective 3

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A student must take at least 6 hours of American literature in the total program.

Teacher certification

Students preparing to teach English in high school may adopt either of two programs: the major outlined above, leading to the B.A. degree; or the major in secondary education, leading to the B.S. degree. Majors desiring certification should consult their advisors in the English department. For specific certification requirements in secondary education, please see the College of Education section of this catalog.

Courses for nonmajors

The department offers many general education courses for the nonmajor student. All are intended to introduce such students to the appreciation of language and literature. Examples are: ENGL 210, 220, 230, 231, 233, and 234; 310; 320; 340; 345; 350; 360; 365; 370; 375; 387; 492; 505; 510; 515; 520; 560; 570; and 751. In general it is proper to substitute in any program of study an advanced course for an elementary one, if the student so elects and the teacher consents. Only one course among ENGL 230, 231, 233, 234, 310, 320, 340, 345, and 492 may be taken for major credit.

Graduate study

The department awards the M.A. degree, for which the emphasis may be on British or American literature, or creative writing, or language and composition.

Candidates for graduate work should have completed an undergraduate major with at least 24 hours in English above freshman composition; otherwise, they will be asked to do additional undergraduate work to make up deficiencies. Additional requirements of the Graduate School may be found in the appropriate section of this catalog.

Requirements for the M.A. include a minimum of 30 semester hours of course work and research. Candidates in the British and American literature option must demonstrate competence in one foreign language.

Students in creative writing or in language and composition may substitute ENGL 810, Old English for the language requirement. A written examination is required. A two-hour report is required as are ENGL 790, History of the English Language (unless waived), and ENGL 802, Graduate Studies in English.

For more detailed and current information, contact the director of graduate studies, Department of English, 107 Denison Hall, Kansas State University, Manhattan, Kansas 66506-0701.

Courses in English

ENGL 030. Writing Laboratory. (2) I, II, S. Credit/No Credit. Laboratory practice in writing for all students who need review in fundamentals of composition. Especially for students who have difficulty in meeting standards in English Composition I and II, but also designed to assist students who desire to improve their composition skills. Hours are not applicable toward degree requirements. Pr.: Consent of instructor. ENGL-030-1-1501

ENGL 035. Special Studies in Intensive English. (3-12) I, II, S. Equivalent to enrollment in one or two segments (structure, writing, reading, or speaking and listening) of Intermediate Intensive English I or II. Placement by the English Language Program according to the student's needs and ability level. ENGL-035-0-1508

ENGL 038. Beginning English II. (15) I, II. Intensive study of basic English syntax, writing, reading, speaking, and listening for native speakers of other languages. Pr.: Minimum TOEFL score of 350. ENGL-038-0-1508

ENGL 040. Intermediate Intensive English I. (15) I, II. Intensive study of basic English sentence structure, writing, reading, speaking, and listening for native speakers of other languages. Pr.: Minimum TOEFL score of 400. ENGL-040-0-1508

ENGL 050. Intermediate English II. (15) I, II. Continued intensive study of English structure, writing, reading, speaking, and listening. Placement by the English Language Program. ENGL-050-0-1508

DAS 060. Intensive English. (10) S. Intensive study of English for native speakers of other languages. Instruction in English language structure, writing, reading, speaking, and comprehension. ENGL-060-0-1508

ENGL 070. Advanced English as a Second Language. (6) I, II. A support course required of international students whose performance on the English screening test indicates that they would still benefit from half-time instruction in English. Three specialized sections are offered: for undergraduates, for graduate students in technical fields, and for graduate students in nontechnical fields. Placement by the English Language Program or on the recommendation of an advisor. ENGL-070-0-1508

ENGL 075. English for International Students. (3) I, II. Distinguished from DAS 060 by being a nonintensive, 3-hour university support course. English structure, reading, and writing for graduate or undergraduate nonnative speakers who wish to reduce a written language deficiency or to prepare for Composition I. Required of students who do not pass the Written English Proficiency Test. Students may also be admitted on recommendation of their advisor. Repeatable if necessary. ENGL-075-0-1508

Undergraduate credit

ENGL 100. English Composition I. (3) I, II, S. Instruction in the organization of expository writing. Taught as laboratory-workshop, the course offers extensive practice in the writing of English themes as models of nonfiction prose. Theme and paragraph organization and the basic elements of sentence structure and grammar receive emphasis. ENGL-100-0-1501

ENGL 110. English Honors Composition I. (3) I, II, S. Critical reading and composition for freshmen whose scores on their entrance examinations indicate that they will benefit from a more sophisticated and challenging program than that of ENGL 100. Students may also be admitted at the discretion of the chairman of the English department honors committee. ENGL-110-0-1501

ENGL 120. English Composition II. (3) I, II, S. Continues instruction offered in English Composition I. Emphasizing the practice of expository and persuasive writing, the course analyzes prose models of expository writing and further instructs students in grammar, punctuation, and English usage. Pr.: ENGL 100 or 110. ENGL-120-0-1501

ENGL 125. English Honors Composition II. (3) I, II. Advanced critical reading and composition. Students who receive "A" in ENGL 100 may, on the recommendation of their instructor and the chairman of the English department honors committee, be admitted to ENGL 125. Students who are members in good standing of one of the various college honors programs may also be admitted. Otherwise, admission is on the same basis as that for ENGL 110. ENGL-125-0-1501

ENGL 150. English Studies Abroad. (2-3) Intercession only. Travel abroad, with selected readings, lectures, and discussions which explore the relationships between literary texts and their physical and cultural environments. ENGL-150-0-1501

ENGL 200. Intermediate Composition. (3) I, II, S. To improve and refine writing skills beyond those which are characteristic of freshman-level writing; based on individual student needs, the course provides further work on organization, sentence structure, diction, and rhetoric. Pr.: ENGL 120 or 125. ENGL-200-0-1501

ENGL 201. Writing the Public Essay. (3) I, II. Instruction in and practice of writing papers suitable for presentation to social, public, or professional forums. Pr.: ENGL 120 or 125. ENGL-201-0-1501

ENGL 205. The Research Paper. (2) I, II, S. Surveys the process of writing a research paper, from the initial choice of topic to the final documented paper. Not for major credit. Pr.: ENGL 100. ENGL-205-0-1501

ENGL 210. The Uses of Poetry. (1) I, II, S. Credit/No Credit only. Not for major credit. To provide the experience of poetry read for pleasure, for knowledge, and for personal fulfillment. Repeatable once. ENGL-210-0-1502

ENGL 220. Fiction into Film. (2) I, II, S. Discussions of film adaptation of works of literature. Not for major credit. ENGL-220-0-1501

ENGL 230. Humanities: Classical Cultures. (3) I, S. ENGL-230-0-4901

ENGL 231. Humanities: Medieval and Renaissance. (3) II, S. ENGL-231-0-4901

ENGL 233. Humanities: Baroque and Enlightenment. (3) I, S. ENGL-233-0-4901

ENGL 234. Humanities: Modern. (3) II, S. This and the three courses above seek to develop a greater understanding, appreciation, and enjoyment of the humanistic resources of Western culture. The student is introduced to the great works of literature, philosophy, art, music, and religion in each major period. The courses may be taken individually and in any order. ENGL-234-0-4901

ENGL 251. Introduction to Literature. (3) I, II, S. Study of form and technique in works of fiction, poetry, and drama. Not for English majors. ENGL-251-0-1502

ENGL 252. Introduction to Literary Studies. (3) I, II, S. Elements of literary form and style: an introduction to criticism for English majors. Intended as a first course in the analysis of form and technique, an introduction to literary terms commonly used in later courses, and practice in critical writing. Readings from a broad range: poems, plays, essays, and novels. ENGL-252-0-1502

ENGL 261. British Literature: Medieval and Renaissance. (3) I, II, S. Major works to about 1700, selected for the general student; emphasizing Chaucer, Shakespeare, and Milton. Will not apply to survey requirement for English majors. ENGL-261-0-1502

ENGL 262. British Literature: Enlightenment to Modern. (3) I, II, S. Major works since about 1700, selected for the general student. Will not apply to survey requirement for English majors. ENGL-262-0-1502

ENGL 271. American Literature: Colonial through Romantic. (3) I, II, S. Major works selected for the general student. Will not apply to survey requirement for English majors. ENGL-271-0-1502

ENGL 272. American Literature: Realists and Moderns. (3) I, II, S. Major works selected for the general student. Will not apply to survey requirement for English majors. ENGL-272-0-1502

ENGL 297. Honors Introduction to the Humanities I. (3) I. Study of selected major works of history, literature, and philosophy which have been of central importance in the Western cultural tradition. Considerable emphasis is placed on classroom discussion and writing interpretive essays. Limited to entering freshman students. Pr.: Consent of instructor. Same as HIST 297, MLANG 297, PHILO 297. ENGL-297-0-401

ENGL 298. Honors Introduction to the Humanities II. (3) II. Continuation of ENGL 297. Pr.: ENGL 297 or consent of instructor. Same as HIST 298, MLANG 298, PHILO 298. ENGL-298-0-4901

ENGL 299. Honors Topics in English. (3) I, II. Readings and colloquia in selected topics in literature or language. Pr.: Open only to arts and sciences honors program students and to others completing ENGL 100 or 120 and 110 or 125 with a 3.5 GPA. ENGL-299-1-1502

ENGL 301. Writing and the Law: Legislative Analysis. (3) I, II. Practice in criticizing and constructing arguments about interpretations of statutes (administrative regulations, ordinances, state and federal codes, constitutions) in the context of particular facts. Close attention to recognizing and resolving problems of ambiguity and vagueness. Individual tutorial is an important feature of the course. Pr.: ENGL 120 or 125. ENGL-301-0-1501

ENGL 310. Introduction to Fiction. (3) I, II, S. Selected short stories, novellas, and novels from world literature, with emphasis on the present. Concern for the forms of fiction and critical analysis. ENGL-310-0-1501

ENGL 320. Introduction to the Short Story. (3) I, II, S. Study of American, British, and Continental stories. ENGL-320-0-1501

ENGL 340. Introduction to Poetry. (3) I, II, S. Close reading of poems and analysis of poetic genres, with emphasis on modern poetry. ENGL-340-0-1502

ENGL 345. Introduction to Drama. (3) I, II, S. Study of drama from classical times to the present. ENGL-345-0-1502

ENGL 350. Introduction to Shakespeare. (3) I, II, S. Study of representative comedies, histories, and tragedies. ENGL-350-0-1502

ENGL 361. British Survey I. (3) I, II, S. English literature from Anglo-Saxon times through Milton. Will apply to survey requirement for English majors. ENGL-361-0-1502

ENGL 362. British Survey II. (3) I, II, S. English literature from Dryden to the end of the nineteenth century. Will apply to survey requirement for English majors. ENGL-362-0-1502

ENGL 381. American Survey I. (3) I, II, S. An introductory review of our literary history from the early accounts of colonization through the American Renaissance. Will apply to survey requirement for English majors. ENGL-381-0-1502

ENGL 382. American Survey II. (3) I, II, S. An introductory review of our literary history from the Civil War to the present. Will apply to survey requirement for English majors. ENGL-382-0-1502

ENGL 387. Great Books. (3) I, II, S. Introduction to world classics from past to present. Not for English majors. Repeatable once with change of syllabus. ENGL-387-0-1502

ENGL 390. Fable and Fantasy. (3) I, II, S. Study of modern works in the fabulous or fantastic modes in relation to the traditions underlying them. Pr.: ENGL 100 or I10. ENGL-390-0-1502

ENGL 395. Topics in English. (0-3) I, II, S. Selected studies in literature and language. Repeatable with change in topic. Pr.: Consent of instructor. ENGL-395-0-1501

ENGL 399. Honors Seminar in English. (1-3) I. Readings and colloquia in selected masterpieces. May not be used for English major credit. Pr.: Honors students only. ENGL-399-0-1501

ENGL 400. Advanced Composition. (3) I, II, S. Expository writing, primarily for pre-professional majors (e.g., pre-med) and candidates for secondary education certification. Pr.: ENGL 120 or 125. ENGL-400-0-1501

ENGL 401. Writing and the Law: Case Analysis. (3) II, in alternate years. Practice in the close reading of judicial opinions, and in criticism and construction of arguments about their bearing on novel facts. The focus is on accurate apprehension of constituent issues and argument structure, and careful scrutiny of potential analogies. Features individual tutorial. Pr.: ENGL 301 or 340. ENGL-401-0-1501

ENGL 405. Narrative Writing. (3) I, II. Practice in writing personal narratives including the journal, the reminiscence, journey narrative, family history. Students may choose to work on one or a variety of projects. Repeatable once. Pr.: ENGL 120 or 125. ENGL-405-0-1507

ENGL 415. Written Communication for Engineers. (3) I, II, S. Study of and intensive use of writing forms characteristic of professional practice. Pr.: Enrollment in the College of Engineering with junior or senior standing, and ENGL 100 or equiv. with A or B credit, or ENGL 100 and 120 or equiv. ENGL-415-0-1501

ENGL 490. Development of the English Language. (3) I, S. Depicts the English language in its place among other world languages, and introduces students to the major ways in which English has changed through time. Considers both internal and external influences as causes of language change. Pr.: ENGL 120 or 125. ENGL-490-0-1505

ENGL 492. Humanities Seminar. (3) I, II. Study in depth of selected major figures and movements in Western arts, ideas, and literature. Offered each semester within one of the chronological periods of the introductory courses. Pr.: Appropriate introductory humanities course (or an equiv. background, such as courses in Western civilization, art, or world literature, with consent of instructor). ENGL-492-0-1501

ENGL 498. Honors Tutorial in English. (1-3) I, II, S. Individually guided study in which the student will formulate and explore a narrowly defined topic in literature or language. May be used to initiate research for senior honors thesis. Pr.: Consent of tutorial instructor. ENGL-498-4-1502

ENGL 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. ENGL-499-4-1501

Undergraduate and graduate credit in minor field

ENGL 500. Introduction to Creative Writing. (3) I, II, S. For those beginning the craft of imaginative writing; a practical introduction to poetry and short fiction. Pr.: ENGL 120 or 125. ENGL-500-0-1502

ENGL 501. Writing Children's Literature. (3) I and II. Writing book-length or magazine-length prose for children or material to be presented to children. Pr.: ENGL 120 or 125. ENGL-501-0-1501

ENGL 505. Themes in Literature. (1-3) I, II, S. Explorations of the literary treatment of important and recurring themes. Repeatable with change in theme. Pr.: ENGL 120 or 125. ENGL-505-0-1502

ENGL 510. Literary Kinds. (1-3) I, II, S. Examinations of the characteristics, the growth and development, or the uses of specified literary genres. Repeatable with change in topic. Pr.: ENGL 120 or 125. ENGL-510-0-1502

ENGL 515. Literature and Society. (1-3) I, II, S. Language and literature in relation to social and cultural patterns and influences. Repeatable with change in topic. Pr.: ENGL 120 or 125. ENGL-515-0-1502

ENGL 516. Written Communication for the Sciences. (3) I, II. Theory and intensive writing practice for students in the basic and applied sciences. Junior or senior standing and completion of ENGL 120 or 125. Will not substitute for ENGL 415. ENGL-516-0-1501

ENGL 520. Literature and Film. (3) II, S. This course deals with such matters as the turning of story, novel, play into film; the handling of point of view in fiction and film; the ways fiction and film affect each other in the development of techniques; and the comparison of the forms of literature and film. Pr.: ENGL 120 or 125, or consent of instructor. ENGL-520-0-1503

ENGL 525. Women in Literature. (3) I, II, S. Literary works by or about women. Considers important writers since 1800 and significant themes in literature about women. Pr.: ENGL 120 or 125. ENGL-525-0-1502

ENGL 530. Modern English Grammar. (3) I, II, S. A systematic study of the structure of the English language and a consideration of current theories of analysis, such as traditional, structural, and transformational-generative. Primarily for candidates for the teaching certificate in secondary education-English or for elementary language arts majors. Pr.: ENGL 120 or 125. ENGL-530-0-1505

ENGL 535. Literature of Aging. (3) I. The process of aging, as reflected and revealed in various literary forms: short story and novella, novel, drama, and poetry. Concerned with the problems and relationships of, and the responses to, aging. Pr.: ENGL 120 or 125 or consent of instructor. ENGL-535-0-1502

ENGL 540. Literature for Children. (3) I, II, S. A survey of literature for children, providing an opportunity for reading and evaluating books for children. For teachers of elementary grades. Pr.: Sophomore standing. ENGL-540-0-1502

ENGL 545. Literature for Adolescents. (3) I, II, S. Selecting, reading, and evaluating books for adolescents. For teachers in the junior and senior high school and students of guidance for adolescents. Pr.: ENGL 120 or 125, and junior standing. ENGL-545-0-1502

ENGL 560. American Folklore and Folk Literature. (3) I, II, S. Focus on definition, form, and function of folktales and anecdotes, legends, proverbs and riddles, and beliefs and customs. Pr.: Junior standing. ENGL-560-0-1502

ENGL 570. English Bible. (3) I, II, S. The Bible as literature and history; cultural and historical backgrounds of the Old Testament. Pr.: ENGL 120 or 125. ENGL-570-0-1504

Undergraduate and graduate credit

ENGL 600. Principles of Linguistics. (3) I, II, S. The scientific study of language, with examples from English, Spanish, French, German, and others. Overview of language origins, phonetics, phonology, syntax, semantics, language acquisition, dialects, language change, and writing systems. Same as LING 600 and LG 600. ENGL-600-0-1505

ENGL 601. General Phonetics. (3) I or II, in alternate years. Description and classification of speech sounds according to point and manner of articulation. Transcription in the International Phonetic Association Alphabet. Includes sounds of English, French, Spanish, German, and others. Same as LING 601 and LG 601. ENGL-601-1-1505

ENGL 602. Historical Linguistics. (3) I or II, in alternate years. Internal and comparative reconstruction of earlier forms of languages. Genetic relationships in language families, and various typological considerations. Includes French, Spanish, and others. Same as LING 602 and LG 602. ENGL-602-0-1505

ENGL 603. Topics in Linguistics. (3) I or II, in alternate years. Seminar on a special topic in linguistics. Topic to be announced for semester in which offered. Repeatable for credit on a different topic. Same as LING 603 and LG 603. ENGL-603-0-1505

ENGL 651. Twentieth Century Afro-American Literature. (3) I. A survey of Afro-American literature in the twentieth century, including Johnson, Toomer, McKay, Hurston, Petry, Wright, Ellison, and Baldwin. Pr.: Junior standing. ENGL-651-0-1502

ENGL 652. American Indian and Chicano Literature. (3) II. A survey of American Indian and Chicano literatures in the twentieth century, including Momaday, Silko, Welch, McNickle, Anaya, Villareal, Romero, and Barrio. Pr.: Junior standing. ENGL-652-0-1502

ENGL 699. Special Studies in English. (3) I, II, S. Intensive study of an author, a theme, or a genre in British or American literature. Pr.: Senior or graduate standing and consent of instructor. ENGL-699-0-1501

ENGL 706. Arthurian Literature. (3) II, in alternate years. A survey of Arthurian literature in the medieval West, with emphasis on the writings of Malory and some attention to his influence on later English literature. Pr.: Junior standing. ENGL-706-0-1502

ENGL 707. Medieval Literature. (3) II, in alternate years. Study of selected themes and forms in medieval literature. Pr.: Junior standing. ENGL-707-0-1502

ENGL 708. Chaucer. (3) I, II, S. Pr.: Junior standing. ENGL-708-0-1502

ENGL 711. Elizabethan Nondramatic Literature. (3) I, in alternate years. An introduction to the literature of the English Renaissance. Pr.: Junior standing. ENGL-711-0-1502

ENGL 714. British Drama to 1642. (3) I, S, in alternate years. A survey of the dramatic literature of Elizabethan and Jacobean times, exclusive of Shakespeare. Pr.: Junior standing. ENGL-714-0-1502

ENGL 716. Shakespeare: Comedies and Histories. (3) I, S, in alternate years. A study of Shakespearean drama from the first plays through about 1600, with emphases on the histories and comedies; special attention to the criticism and bibliography. Pr.: Junior standing. ENGL-716-0-1502

ENGL 717. Shakespeare: Tragedies and Romances. (3) II, S, in alternate years. A study of Shakespearean drama from about 1601 through the last plays, with emphases on the mature tragedies and the romances; special attention to the criticism and bibliography. Pr.: Junior standing. ENGL-717-0-1502

ENGL 721. Seventeenth Century Literature. (3) II, S. A survey of the principal nondramatic writers, apart from Milton. 1600-1660. Pr.: Junior standing. ENGL-721-0-1502

ENGL 722. Milton. (3) II, S. Pr.: Junior standing. ENGL-722-0-1502

- ENGL 724. Restoration and Eighteenth Century Drama.** (3) I, S, in alternate years. A survey of English dramatic literature from 1660 to 1800. Pr.: Junior standing. ENGL-724-0-1502
- ENGL 726. Eighteenth Century I.** (3) I, S. English literature from the Restoration to the death of Swift, with emphases on Dryden, Swift, and Pope. Pr.: Junior standing. ENGL-726-0-1502
- ENGL 727. Eighteenth Century II.** (3) II, S. The age of Dr. Johnson and the beginnings of romanticism. Pr.: Junior standing. ENGL-727-0-1502
- ENGL 731. British Novel I.** (3) I, S. A survey of British fiction from Defoe to the Brontës. Pr.: Junior standing. ENGL-731-0-1502
- ENGL 732. British Novel II.** (3) II, S. A survey of British fiction from Dickens and Thackeray to Galsworthy and Bennett. Pr.: Junior standing. ENGL-732-0-1502
- ENGL 736. The Romantic Movement.** (3) I, S. The poetry and prose of Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats. Pr.: Junior standing. ENGL-736-0-1502
- ENGL 738. Early American Literature.** (3) I. Literary beginnings in seventeenth century Virginia and New England; eighteenth century prose and poetry, including the first plays and novels. Pr.: Junior standing and at least one other literature course. ENGL-738-0-1502
- ENGL 739. The New England Transcendentalists.** (3) II, in alternate years, S. A study of the transcendental movement, with emphases on Emerson and Thoreau. Pr.: Junior standing. ENGL-739-0-1502
- ENGL 741. Nineteenth Century American Poetry.** (3) II, S. Emphases on Poe, Whitman, and Dickinson. Pr.: Junior standing. ENGL-741-0-1502
- ENGL 742. Nineteenth Century American Fiction I.** (3) I, S. Emphases on Cooper, Poe, Hawthorne, and Melville. Pr.: Junior standing or ENGL 280. ENGL-742-0-1502
- ENGL 743. Nineteenth Century American Fiction II.** (3) II, S. Emphases on Twain, James, Howells, Crane, and Norris. Pr.: Junior standing. ENGL-743-0-1502
- ENGL 748. The Victorian Era.** (3) II, S. The poetry of Arnold, Browning, and Tennyson; the criticism of Arnold; additional related prose. Pr.: Junior standing. ENGL-748-0-1502
- ENGL 751. American Humor and Satire.** (3) II, S. Emphases on works produced in the nineteenth and twentieth centuries. Pr.: Junior standing. ENGL-751-0-1502
- ENGL 754. Twentieth Century British Novel.** (3) II. British fiction from Conrad and Joyce to Greene and Waugh. Pr.: Junior standing. ENGL-754-0-1502
- ENGL 756. Twentieth Century American Novel.** (3) I, S. The American novel from Dreiser to figures of the 1940s. Pr.: Junior standing. ENGL-756-0-1502
- ENGL 757. Twentieth Century American Short Story.** (3) II, S. The development of the form since 1900. Pr.: Junior standing. ENGL-757-0-1502
- ENGL 758. American Novel, 1950-1970.** (3) II, in alternate years. A study of distinctive qualities of selected American novels since 1950. Pr.: Junior standing. ENGL-758-0-1501
- ENGL 761. Advanced Creative Writing: Prose Fiction.** (3) I, II, S. Advanced writing of prose fiction. Repeatable once. Pr.: ENGL 500, or proof of equiv. proficiency. ENGL-761-0-1507
- ENGL 762. Advanced Playwriting.** (3) Same as THTR 762. ENGL-762-0-1507
- ENGL 763. Advanced Creative Writing: Poetry.** (3) I, II, S. Advanced writing of poetry. Repeatable once. Pr.: ENGL 500 or proof of equiv. proficiency. ENGL-763-0-1507
- ENGL 764. Twentieth Century British Drama.** (3) I, S. British drama from Wilde and Shaw to Pinter and his contemporaries. Pr.: Junior standing. ENGL-764-0-1502
- ENGL 765. Twentieth Century American Drama.** (3) II, S. American drama from O'Neill and Rice to Leroi Jones and his contemporaries. Pr.: Junior standing. ENGL-765-0-1502
- ENGL 766. Twentieth Century British Poetry.** (3) I. Development of British poetry from Hardy and Yeats to the present. Pr.: Junior standing or ENGL 265. ENGL-766-0-1502
- ENGL 767. Twentieth Century American Poetry.** (3) II, S. Development of American poetry from Robinson and Frost to the present. Pr.: Junior standing or ENGL 285. ENGL-767-0-1502
- ENGL 790. History of the English Language.** (3) II, S. The development of British and American English from Indo-European origins to the present. Pr.: Senior standing or consent of instructor. ENGL-790-0-1505
- ENGL 792. Studies in Composition.** (3) I, S. Examination of research and theories applicable to the study of written composition, of sources of information germane to written composition, and of current substantive issues involving written composition. Pr.: Junior standing and 18 hours of English. ENGL-792-0-1501
- ENGL 793. Studies in Technical Communication.** (3) I. Examination of theories, research, and practices in technical communication, with some emphasis on the invention of appropriate strategies for its teaching. Pr.: Senior standing. ENGL-793-0-1505
- ENGL 794. History and Theory of Composition.** (3) II, S. An overview of the tradition out of which modern rhetoric and composition courses have emerged. Also an evaluation of current research in composition theory and methodology. Pr.: Junior standing, and 18 hours of English. ENGL 400 is recommended. ENGL-794-0-1501
- ENGL 795. Literary Criticism.** (3) I, S. Major points of view in modern American and British criticism, with practice in the analysis and judgment of individual literary works. Pr.: Senior standing. ENGL-795-0-1502
- ENGL 796. Theories of Grammar.** (3) I, S. Comparative examination of the assumptions, aims, and procedures of four types of English grammar—the normative grammar of Robert Lowth, the historical grammar of Otto Jespersen, the structural grammar of Leonard Bloomfield, and the generative-transformational grammar of Noam Chomsky—and their application. Pr.: Junior standing, and ENGL 530 or ENGL 600. ENGL-796-0-1505
- ENGL 799. Problems in English.** (Var.) I, II, S. Independent study in major authors, genres, and periods of English and American literature and language. Pr.: Background of courses needed for problem undertaken. ENGL-799-3-1501
- Graduate credit**
- ENGL 802. Graduate Studies in English.** (1) I, II, S. A survey of the principles of research and scholarship, the range of literary studies, basic bibliographies and other aids, and the techniques of writing documented papers. Required in the first year of study toward the M.A. in English as an orientation to the profession. ENGL-802-0-1502
- ENGL 810. Old English.** (3) I, S. The elements of Old English grammar, with readings in prose and poetry. Pr.: Consent of instructor. ENGL-810-0-1505
- ENGL 820. Selected Topics in the Study of Language.** (3) Pr.: ENGL 790 or consent of instructor. ENGL-820-0-1505
- ENGL 825. Selected Topics in the Study of Literature.** (3) Intensive study of a topic covering one or more literary genres, periods, or authors. Pr.: Graduate standing. ENGL-825-0-1502
- ENGL 850. Shakespeare Seminar.** (3) Pr.: ENGL 716 or 717. ENGL-850-0-1502
- ENGL 861. Creative Writing Workshop: Short Fiction.** (3) I, II, S. Advanced writing of short prose fiction. May be repeated twice for credit. Pr.: ENGL 761 or equiv. ENGL-861-0-1507
- ENGL 862. Workshop in Playwriting.** (3) I, II, S. Advanced writing in drama. May be repeated once for credit. Same as THTR 862. Pr.: THTR 762 (or ENGL 762). ENGL-862-0-1507
- ENGL 863. Creative Writing Workshop: Poetry.** (3) I, II, S. Advanced writing of poetry. May be repeated twice for credit. Pr.: ENGL 763 or equiv. proficiency. ENGL-863-0-1507
- ENGL 864. Creative Writing Workshop: The Novel.** (3) II. May be repeated twice for credit. Pr.: ENGL 761 or equiv. ENGL-864-0-1507
- ENGL 898. Master's Report.** (2) I, II, S. ENGL-898-4-1501
- ENGL 900. Bibliography and Methods of Research.** (3) I, S. An introduction to textual, bibliographic, and professional problems, required of Ph.D. candidates. ENGL-900-0-1502
- ENGL 930. Studies in Medieval English Literature.** (3) I, II, S. Pr.: Consent of instructor. ENGL-930-0-1502
- ENGL 940. Studies in Sixteenth Century Literature.** (3) Pr.: Consent of instructor. ENGL-940-0-1502
- ENGL 950. Studies in Seventeenth Century Literature.** (3) Pr.: Consent of instructor. ENGL-950-0-1502
- ENGL 960. Studies in Eighteenth Century Literature: British.** (3) Pr.: Consent of instructor. ENGL-960-0-1502
- ENGL 965. Studies in American Literature before 1800.** (3) Pr.: Consent of instructor. ENGL-965-0-1502
- ENGL 970. Studies in Nineteenth Century Literature: British.** (3) Pr.: Consent of instructor. ENGL-970-0-1502
- ENGL 975. Studies in Nineteenth Century Literature: American.** (3) Pr.: Consent of instructor. ENGL-975-0-1502
- ENGL 980. Studies in Twentieth Century Literature: British.** (3) Pr.: Consent of instructor. ENGL-980-0-1502
- ENGL 985. Studies in Twentieth Century Literature: American.** (3) Pr.: Consent of instructor. ENGL-985-0-1502
- ENGL 999. Research in English.** (Var.) I, II, S. Pr.: Sufficient training to carry on the research undertaken. ENGL-999-4-1501

Courses in linguistics

Undergraduate and graduate credit

- ENGL 600. Principles of Linguistics.** (3) The scientific study of language, with examples from English, Spanish, French, German, and others. Overview of language origins, phonetics, phonology, syntax, semantics, language acquisition, dialects, language change, and writing systems. Same as LING 600 and LG 600. ENGL-600-0-1505
- ENGL 601. General Phonetics.** (3) I or II, in alternate years. Description and classification of speech sounds according to point and manner of articulation. Transcription in the International Phonetic Association Alphabet. Includes sounds of English, French, Spanish, German, and others. Same as LING 601 and LG 601. ENGL-601-1-1505
- ENGL 602. Historical Linguistics.** (3) I or II, in alternate years. Internal and comparative reconstruction of earlier forms of languages. Genetic relationships in language families, and various typological considerations. Includes French, Spanish, and others. Same as LING 602 and LG 602. ENGL-602-0-1505
- ENGL 603. Topics in Linguistics.** (3) I or II, in alternate years. Seminar on a special topic in linguistics. Topic to be announced for semester in which offered. Repeatable for credit on a different topic. Same as LING 603 and LG 603. ENGL-603-0-1505

ENGL 783. Phonology I. (3) Same as LING 783 and MLANG 783. ENGL-783-0-1502

ENGL 785. Syntax I. (3) Same as LING 783 and MLANG 785. ENGL-785-0-1502

ENGL 791. Methods and Techniques of Learning a Second Language. (3) ENGL-791-0-1502

Geography

M. D. Nellis,* Head

Professors Kromm,* Siddall,* and White;* Associate Professors Bussing,* Nellis,* Seamon,* and Seyler;* Assistant Professor Martin; Adjunct Professor Nair; Emeritus: Professor Self and Stover.*

Geographers, in studying the differences in human activities from one place to another, and human impact and responses to the environment, deal with vital questions about current national and international situations.

Geography is a very broad inquiry into the state of the world today, advanced by bringing together the ideas and concepts of many disciplines, especially the social sciences, to obtain some measure of understanding about specific areas.

Geographers also may pursue a more theoretical inquiry into the major problems of human society by examining spatial structure and processes using various techniques of mathematical and cartographic analysis of spatial phenomena, computer mapping, geographic information systems, and remote sensing.

A typical and traditional problem in geography concerns human impact on the land. Air pollution, contamination of waterways, decaying urban areas, destruction of the landscape, and the like, can only be well understood by examining the interrelations of factors such as technology, population density, legal structure, affluence, cultural traditions, and environment.

Undergraduate study

Students of geography may pursue a traditional major in geography or choose the geography-pre-planning option. The bachelor of science or the bachelor of arts degree may be earned for either option.

Geography (B.A. or B.S.)

Requirements for a major in geography:

| | | |
|----------|---|---|
| GEOG 100 | World Regional Geography | 3 |
| | or | |
| GEOG 200 | Human Geography | 3 |
| GEOG 220 | Environmental Geography I | 4 |
| GEOG 221 | Environmental Geography II | 4 |
| GEOG 440 | Geography of Natural Resources | 3 |
| GEOG 450 | Geography of Economic Behavior | 3 |
| GEOG 470 | Cartography | 3 |
| STAT 330 | Elementary Statistics for the Social Sciences (or its equivalent) | 3 |

One course at 500 or 600 level (except GEOG 505 or 506)

One course at 700 level (except GEOG 700,702, or 705) Additional courses at the 490 level or above to total 30 hours

Although the major requirements for the B.A. or B.S. degrees are the same, college requirements differ as described earlier in the College of Arts and Sciences section.

The student may pursue a general program in geography, or may choose to develop a concentration in either environmental studies or community studies. Other concentrations may be developed to reflect the particular interests of a student. For example, a student may earn a teaching certificate while working toward a degree in geography.

Another curriculum leads to the bachelor of science degree in secondary education. For information concerning this program see the College of Education section of this catalog.

Geography: pre-planning (B.A. or B.S.)

Geography is a very appropriate discipline for students who wish to pursue a career in a planning-related field or desire to take graduate training in planning. The geography-pre-planning option is designed to provide a student with both a broad interdisciplinary background and a geographic core curriculum.

The geography course requirements for the pre-planning option are identical to those listed above for the geography major. In addition students must take:

| | | |
|--------------------------------------|------------------------------|---|
| PLAN 315 | Introduction to Planning | 3 |
| and at least three of the following: | | |
| ECON 555 | Urban and Regional Economics | 3 |
| HIST 551 | American Urban History | 3 |
| POLSC 718 | Urban Politics | 3 |
| SOCIO 531 | Urban Sociology | 3 |
| PLAN 715 | Planning Principles | 3 |

Graduate study

Graduate work in geography is offered in the cultural, economic, and environmental aspects of the discipline. Closely related courses in the social sciences, history, planning, and agriculture may be made an integral part of the student's program, and it is possible to arrange a primary concentration in geography with a secondary specialization in regional or community planning for those students interested in planning careers. All candidates for the master of arts degree are required to take GEOG 700, Quantitative Analysis in Geography (except option B students), GEOG 800, Graduate Colloquium, and GEOG 820, History and Philosophy of Geography.

Students may choose, in consultation with their advisors, one of three programs leading to the M.A. degree.

Option A

This option requires 30 hours of graduate credit including 6 hours of credit for a thesis. Of the 24 hours of credit required in

course work, at least 15 hours must be in geography.

Option B

Option B is for students who intend to pursue or continue careers in public school or junior college teaching. It is open only to persons who are already certified to teach at the public school or junior college level in any state, or to those who will make courses required for such certification an integral part of their program. Thirty hours of graduate-level course work is required including two credits of GEOG 898, Master's Report, which shall consist of the design of a teaching syllabus in some subfield of geography. At least 18 credit hours must be in geography. This option is not suitable for any student who may ultimately continue for the doctorate.

Option C

This option is a nonthesis program designed for students who have a specific professional goal in mind other than teaching at any level, and who do not intend to continue for a Ph.D. The student may choose from several approved course groupings. Thirty hours of graduate-level work are required, of which 12 hours may be outside the geography department.

The geography department is equipped with a small reference library, a research map library, a cartography and remote sensing laboratory, microcomputers, computer mapping and geographic information system software, a remote sensing digital image processing system, and a seminar room. The University library contains a large collection of geographical journals. Computer time is available without charge to students for thesis and other research.

Courses in geography

Undergraduate credit

GEOG 100. World Regional Geography. (3) I, II. Introduction to geography structured on a framework of major world regions and countries. With the regional approach is an explicit discussion of the essential concepts of certain systematic specialties, such as political, social, economic, and urban geography. GEOG-100-0-2206

GEOG 200. Human Geography. (3) I, II. A geographical assessment of the way human activities shape landscapes throughout the world. The course is especially appropriate for students interested in the social and behavioral sciences. GEOG-200-0-2206

GEOG 201. Human Geography (Honors). (3) I, in odd years. Spatial aspects of human organization and behavior are examined through selected concepts in modern geography. The course is especially appropriate for students interested in the social and behavioral sciences. Pr.: Membership in arts and sciences honors program. GEOG-201-0-2206

GEOG 220. Environmental Geography I. (4) I, II. A basic physical geography course emphasizing the atmosphere and hydrosphere and treating related problems such as air pollution, drought, and floods. Introduces tools used by geographers in environmental analysis. Three hours lec. and one two-hour lab a week. GEOG-220-1-1917

GEOG 221. Environmental Geography II. (4) I, II. Emphasizes the geosphere and biosphere, including processes, patterns, and physical background for related issues such as energy, soil erosion, and natural hazards. Introduces remote sensing as a tool for environmental study. Three hours lec. and one two-hour lab a week. Pr.: Environmental Geography I. GEOG-221-1-1917

GEOG 310. Geography of Kansas. (3) I, II. A regional geographical analysis of Kansas including discussion of climate, landforms, soil, water, and minerals as well as patterns of settlement, population, agriculture, industry, transportation, and urban development. GEOG-310-0-2206

GEOG 399. Honors Seminar in Geography. (2-3) I, in odd years. Selected topics. Open to nonmajors in the honors program. GEOG-399-0-2206

GEOG 440. Geography of Natural Resources. (3) I. The distribution, significance, and environmental consequences of world agriculture, fishing, forestry, and mining, emphasizing the principles which account for the spatial variation in the extraction and consumption of natural resources. GEOG-440-0-2206

GEOG 450. Geography of Economic Behavior. (3) II. The location of manufacturing industries and patterns of commercial activity. Case studies and simulations are used with emphasis on modern concepts of site selection and community development. GEOG-450-0-2206

GEOG 460. Future Worlds. (3) S. Alternative future distributions of population, pollution, resource depletion, economic development, and human conflict will be treated in lectures and reading, and discussed by representatives of business, politics, religion, and academia. GEOG-460-0-2206

GEOG 470. Cartography. (3) I. Theory, interpretation, design, and drafting of maps, with emphasis on presenting quantitative data. GEOG-470-1-2206

GEOG 490. Problems in Geography. (Var.) I, II, S. Pr.: Consent of instructor. GEOG-490-4-2206

GEOG 498. Honors Tutorial in Geography. (1-3) I, II. Individual directed research and study of a topic in geography, normally as a preliminary to writing a senior honors thesis. May be repeated once to a total of 3 hours. Pr.: Sophomore standing, membership in the honors program of the College of Arts and Sciences, and permission of the instructor. GEOG-498-4-2206

GEOG 499. Senior Honors Thesis (2) I, II, S. Open only to seniors in the arts and sciences honor program. GEOG-499-4-2206

Undergraduate and graduate credit

GEOG 500. Geography of the United States. (3) II, in even years. A regional analysis of the United States with special attention to the historical, political, economic, and social factors which contribute to areal differentiation within the area. GEOG-500-0-2206

GEOG 505. Introduction to the Civilization of South Asia I. (3) Interdisciplinary survey on the development of civilization in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including consideration of the geographical and demographic context, philosophical and social concepts, social and political institutions, literature, and historical movements. Same as ECON 505, HIST 505, POLSC 505, SOCIO 505, ANTH 505. GEOG-505-0-2206

GEOG 506. Introduction to the Civilization of South Asia II. (3) Interdisciplinary survey of recent and contemporary civilization of India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including recent history, current economy, religion, culture, language and literature, geography, social and political structure and ideas. Same as ECON 506, HIST 506, POLSC 506, SOCIO 506, ANTH 506. GEOG-506-0-2206

GEOG 620. Geography of Latin America. (3) II. A broad survey of the physical and human patterns of the Latin American culture area, past and present, with emphasis on the changing landscape features in the successive patterns of human occupancy. GEOG-620-0-2206

GEOG 640. Geography of Europe. (3) I, in odd years. People and their environment, their cultures, problems, and prospects in Europe west of the Soviet Union; trends of development as affected by changing political and economic factors. GEOG-640-0-2206

GEOG 650. Geography of the Soviet Union. (3) I, in even years. Soviet physical limitations, resource potentials, economic capabilities, and social issues, with particular emphasis on agriculture, manufacturing, urbanization, cultural diversity, and regional development. Pr.: Six hours of social science. GEOG-650-0-2206

GEOG 680. Seminar in Regional Geography. (1-3) Pr.: Consent of instructor. GEOG-680-0-2206

GEOG 700. Quantitative Analysis in Geography. (3) II. Quantitative methods employed in modern geographical research. Applications of both statistical and mathematical approaches will be treated. Emphasis will be placed on interpretation and evaluation of techniques employed in spatial analysis. Pr.: One course in statistics. GEOG-700-0-2206

GEOG 702. Computer Mapping. (3) I, II, in odd years; and I, in even years. Familiarizes students with computer applications to mapping problems. Students will produce a series of maps on the printer and plotter using prepared programs, and in the process develop computer graphics skills to address problems in areal analysis, planning, and public administration. Pr.: One course in social science and one in natural science and junior standing. GEOG-702-0-2206

GEOG 705. Remote Sensing of the Environment. (3) I, II. Remote sensing and its application to earth study, especially environmental problems and land use. Course employs both readings and the use of imagery. Two hours lec., two hours lab. Pr.: One course in physical science and one in biological science. GEOG-705-1-2206

GEOG 710. Geography of Hunger. (3) I, in odd years. The problem of an adequate food supply for a rapidly growing world population; food deficit and surplus areas, possibilities of increased production, problems of distribution, and the future outlook. Pr.: Six hours of social science and junior standing. GEOG-710-0-2206

GEOG 715. World Population Patterns. (3) I, in even years. Geographical processes that govern population distributions, growth rates, and migrations. Emphasis on international comparisons and the implications for world society of continued differential growth rates. Pr.: Six hours of social science. GEOG-715-0-2206

GEOG 720. Geography of Land Use. (3) I, in odd years. Critical factors affecting land use, scarcity, and management examined in a regional, national, and global context; land use classification systems and variation of land use patterns. Pr.: Six hours of social science and junior standing. GEOG-720-0-2206

GEOG 725. Geography of Water Resources. (3) II, in even years. Interpretation and analysis of water as a resource. Evaluation of water use emphasizing problems associated with geographic distribution, conflicting demands, regional development, and pollution. Pr.: Senior standing. GEOG-725-0-2206

GEOG 730. World Agricultural Systems. (3) I, in even years. Description and analysis of the spatial distribution of farm systems emphasizing traditional resource systems in the third world. The major objective is to analyze the interrelationships between natural and human elements in farm systems in order to gain an awareness and understanding of the complex issues involved in agricultural change and development. Pr.: Six hours of social science and junior standing. GEOG-730-0-2206

GEOG 740. Geography of Transportation. (3) I, in odd years. A consideration of the nature of spatial interaction, the various kinds of transport media, and the relationship between transportation and economic and social patterns. Pr.: Junior standing or consent of instructor; six hours of social science. GEOG-740-0-2206

GEOG 750. Urban Geography. (3) I. A study of geographic principles relating to the distribution, function, and structure of cities; a geographic analysis and classification of urban settlements. Pr.: Six hours of social science or planning. GEOG-750-0-2206

GEOG 760. Human Impact on the Environment. (3) II, in even years. The social, economic, and political implications of the impact of human activity on the natural environment. Field research in environmental impact assessment. Pr.: Six hours of social science. GEOG-760-0-2206

GEOG 770. Perception of the Environment. (3) II, in odd years. An examination of the way people perceive their geographic environment and the role of perception in spatial behavior. Perceptions of neighborhoods, cities, states, nations, frontier regions, and environmental processes are explored. Pr.: Six hours of social science with one course above the introductory level, and 6 hours of natural science with one course above the introductory level. GEOG-770-0-2206

GEOG 780. Cultural Geography. (3) II, in even years. A study of the forms of human occupancy of landscapes, with consideration of innovations in the use of the landscape, the origins and dispersals of these innovations, and human attitudes toward the natural environment. Pr.: Six hours of social science. GEOG-780-0-2206

GEOG 790. Seminar in Cultural-Economic Geography. (1-3) Pr.: Consent of instructor. GEOG-790-0-2206

Graduate credit

GEOG 800. Graduate Colloquium. (2) I. The nature, aims, methods, and evaluation of geographical research. Required of all graduate students majoring in geography. GEOG-800-0-2206

GEOG 820. History and Philosophy of Geography. (2) I. A critical examination of the aims and methods of geography, especially in terms of its historical development and its logical structure. Pr.: Open to all graduate students in social sciences. GEOG-820-0-2206

GEOG 850. Topics in Environmental Geography. (1-3) I, II, S. Pr.: Consent of instructor. GEOG-850-3-2206

GEOG 860. Topics in Economic Geography. (1-3) I, II, S. Pr.: Consent of instructor. GEOG-860-3-2206

GEOG 870. Topics in Cultural Geography. (1-3) I, II, S. Pr.: Consent of instructor. GEOG-870-3-2206

GEOG 898. Master's Report. (2) I, II, S. For students enrolled in geography option B. Pr.: Registration in Graduate School, with sufficient training to carry on the line of research undertaken. Consent of instructor. GEOG-898-4-2206

GEOG 899. Master's Thesis. (6) I, II, S. For students enrolled in geography option A. Pr.: Registration in Graduate School, with sufficient training to carry on the line of research undertaken. Consent of instructor. GEOG-899-4-2206

Geology

Joseph L. Graf, * Head

Professors Chaudhuri,* Clark,* Cullers,* Doveton, Martin,* Schultze,* Twiss,* Underwood,* and West;* Associate Professor Graf;* Assistant Professors Archer,* Franseen, Harris, Maples,* Oviatt,* and Watney;* Emeriti: Professors Chelikowsky,* Shenkel,* and Walters;* Assistant Professor Riseman.*

Traditionally defined as the study of the earth's composition, behavior, and history, geology now includes the study of the mem-

bers of the solar system. As a science, it is both practical and highly theoretical.

The earth and other members of the solar system are dynamic physical systems composed of atoms interacting under varied conditions of temperature and pressure. Geology relies heavily on mathematics and other sciences—physics, chemistry, biology, and astronomy. In the solar system, the earth has been the only known habitat of life, where it has existed for at least the last three billion years.

Geologists operate in two laboratories: the earth itself (field laboratory) and the standard chemical, physical, or biological laboratory. However, geologists cannot control the variables affecting the natural processes operating in the field, as a chemist can control the variables experimentally in a laboratory. Geologists are the observers of processes in operation or already concluded and often must deduce conclusions from incomplete data or by analogy with processes that may be reproduced only in part in a laboratory.

Undergraduate study

The Department of Geology offers optional programs of study in geology and geophysics and cooperates with the College of Education in an earth science program for high school teachers. It also cooperates with the Department of Civil Engineering in a dual degree in civil engineering and geology. For detailed plans of study, consult the head of the department.

Students in geology and in geophysics must have an overall average grade of C (not a C grade in each course) in their geology, other natural science, mathematics, and computer science courses.

Geology option

In addition to the general requirements for the B.A. or B.S. degree, the following must be completed:

| | | | |
|--|----------------------------------|---|---|
| GEOL 100 | Introductory Geology | 3 | |
| GEOL 130 | Elementary Geology Laboratory | 1 | |
| GEOL 300 | Historical Geology | 4 | |
| GEOL 502 | Mineralogy | 3 | |
| GEOL 503 | Petrology | 3 | |
| GEOL 520 | Geomorphology | 2 | |
| GEOL 581 | Paleobiology | 4 | |
| GEOL 530 | Structural Geology | 3 | |
| GEOL 630 | Stratigraphy/Sedimentology | 4 | |
| GEOL 680 | Field Geology | 6 | |
| Geology elective (two courses at the 600 or 700 level, or one course at the 600 or 700 level and 3 hours of GEOL 599, Senior Thesis) | | | 6 |
| MATH 220 | Analytic Geometry and Calculus I | 4 | |
| PHYS 113 | General Physics I | 4 | |
| PHYS 114 | General Physics II | 4 | |
| CHM 210 | Chemistry I | 4 | |
| CHM 230 | Chemistry II | 4 | |

Geology majors should consult their advisors about elective courses to meet their career and educational needs. Computer literacy is essential for all geologists. The department has lists of recommended electives for students desiring concentrations in energy and minerals, engineering geology, environmental geology, hydrogeol-

ogy, sedimentary geology, and geochemistry. Students intending to earn advanced degrees should visit with the departmental graduate advisor concerning entrance requirements of graduate programs.

Geophysics option

In addition to the general requirements for the B.A. or B.S. degree, the following must be completed:

| | | |
|----------|--|---|
| GEOL 100 | Introductory Geology | 3 |
| GEOL 130 | Elementary Geology Laboratory | 1 |
| GEOL 300 | Historical Geology | 4 |
| GEOL 502 | Mineralogy | 3 |
| GEOL 503 | Petrology | 3 |
| GEOL 520 | Geomorphology | 2 |
| GEOL 530 | Structural Geology | 3 |
| GEOL 581 | Paleobiology | 4 |
| GEOL 605 | Exploration Geophysics | 3 |
| GEOL 630 | Stratigraphy/Sedimentation | 4 |
| GEOL 680 | Field Geology | 6 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| MATH 240 | Elementary Differential Equations | 4 |
| MATH 551 | Applied Matrix Theory | 3 |
| PHYS 213 | Engineering Physics I | 5 |
| PHYS 214 | Engineering Physics II | 5 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS 206 | BASIC Language Laboratory | 2 |
| STAT 703 | Statistical Methods for Natural Scientists | 3 |

Geophysics students desiring advanced degrees should consider PHYS 522, 523, 532, and 621 in addition to the above courses as preparation for graduate programs.

Earth science options for high school teachers

In addition to the general requirements for the B.A. or B.S. degree, the teacher certification requirements and the following must be completed:

| | | |
|----------|-------------------------------|---|
| GEOL 100 | Introductory Geology | 3 |
| GEOL 130 | Elementary Geology Laboratory | 1 |
| GEOL 502 | Mineralogy | 3 |
| GEOL 520 | Geomorphology | 2 |
| GEOG 220 | Environmental Geography I | 4 |
| MATH 100 | College Algebra | 3 |
| MATH 150 | Plane Trigonometry | 3 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| PHYS 191 | Descriptive Astronomy | 3 |
| PHYS 193 | Descriptive Meteorology | 3 |
| BIOL 198 | Principles of Biology | 4 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |

See the College of Education section of this catalog for teacher certification requirements.

Dual degree in civil engineering and geology

Students interested in a career in foundation engineering and construction must complete the B.S. degree requirements in civil engineering and complete the general requirements for a B.A. or B.S. degree in the College of Arts and Sciences and the following: GEOL 300, 502, 503, 520, 530, 630, and 680 (see lists above).

Transfer students

In addition to the general instructions to transfer students, students planning to pursue one of the degree options in geology

should complete as many of the following courses or their equivalents as possible:

| | | |
|----------|-----------------------------------|---|
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| MATH 100 | College Algebra | 3 |
| MATH 150 | Plane Trigonometry | 3 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| SPCH 105 | Public Speaking IA | 2 |
| GEOL 100 | Introductory Geology | 3 |
| GEOL 130 | Elementary Geology Laboratory | 1 |
| GEOL 300 | Historical Geology | 4 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 5 |

Graduate study

Graduate degrees are essential for those who want careers as professional geologists in business, government, or higher education.

The Department of Geology offers the M.S. degree in geology and participates in the Ph.D. program in geology at the University of Kansas. Students desiring information on either M.S. or Ph.D. programs should contact the department head or graduate advisor. Students in the cooperative doctoral program spend one year in residence at the University of Kansas and complete their course work and dissertation research at Kansas State University.

The prerequisite to graduate work for the M.S. degree in geology is the completion of a four-year undergraduate program including suitable preparatory work in geology, chemistry, physics, biology, and mathematics. The Graduate Record Examination (aptitude test and advanced geology test) is required for entrance. Additional requirements of the Graduate School are listed in the appropriate section of this catalog.

The minimum requirements for the M.S. degree in geology are 30 semester hours, including at least 18 hours in geology courses and 6 hours in supporting courses in other departments, and the successful completion of a thesis. For information regarding the minimum requirements for the Ph.D., contact the Department of Geology at the University of Kansas.

Research facilities include: a six-inch, 60-degree solid source mass spectrometer; hydrothermal equipment; x-ray diffractometer and spectrograph; atomic absorption/flame emission spectrophotometer; cathode luminescence microscope; heating/cooling stage for fluid inclusion studies; a fully equipped geochemistry laboratory for isotopic work; instrumentation for chemical analysis of natural waters; and complete petrographic, paleobiological, and general geology laboratories.

The University area contains excellent outcrops and is unusually well situated for field work involving studies in sedimentary

petrology, geochemistry, stratigraphy, groundwater geology, soil mineralogy, petroleum geology, midcontinent-type structure, invertebrate paleobiology, and paleoecology.

Courses in geology

Undergraduate credit

GEOL 100. Introductory Geology. (3) I, II, S. The earth's physical, structural, and dynamic features; the most common minerals and rocks; processes affecting the earth. Three hours rec. a week. GEOL-100-0-1914

GEOL 101. Geology Colloquium. (1-3) I, II. Topics in earth science chosen to illustrate current research of scientists and methods chosen to study the physical universe. At each offering of this course a syllabus will be available giving the topics to be studied and the details of administration of the course. May be repeated once. Not open to geology majors. GEOL-101-0-1914

GEOL 105. Oceanography. (3) I, II. The oceans: their boundaries, contents, and processes. Three hours rec. a week. GEOL-105-0-1919

GEOL 110. Introductory Geology, Honors. (3) I. Survey of earth materials, features, and processes. Higher level of sophistication and challenge than GEOL 100. Three hours rec. a week. GEOL-110-0-1914

GEOL 125. Natural Disasters. (3) I, II, S. Discussion of geological phenomena such as earthquakes, volcanic eruptions, landslides, and floods, with particular emphasis on their causes, effects, and significance as hazards. Three hours rec. a week. GEOL-125-0-1914

GEOL 130. Elementary Geology Laboratory. (1) I, II, S. Field and laboratory investigation of minerals, rocks; use of maps; environmental studies; erosion, transportation, sedimentation. Two hours lab a week. Pr.: GEOL 100, 105, or 125 or conc. enrollment. GEOL-130-1-1914

GEOL 300. Historical Geology. (4) I, II. Physical and biological events that have occurred on planet earth throughout geologic time. Three hours rec. and three hours lab a week. Pr.: GEOL 100 or 105. GEOL-300-1-1914

GEOL 305. Earth Resources. (3) I, II. Origin and geologic settings of energy, water, and mineral resources. Additional emphasis will be placed upon exploration and development. Pr.: GEOL 100 or GEOG 221. GEOL-305-0-19014

GEOL 310. Topics in Geology. (1-3) I, II. Seminar discussion of subjects of current interest in geology. Pr.: A course in natural science at the 100 level or higher. GEOL-310-0-1914

GEOL 399. Honors Seminar in Geology. (1-3) I, II. Selected topics. Open to nonmajors in the honors program. GEOL-399-0-1914

GEOL 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. GEOL-499-4-1914

Undergraduate and graduate credit in minor field

GEOL 501. Independent Study in Geology. (1-3) I, II, S. Independent reading; field or laboratory investigations, or both, of geologic problems. Pr.: GEOL 300 and junior standing. GEOL-501-0-1914

GEOL 502. Mineralogy. (3) I. Crystallography; physical and chemical properties of minerals; descriptive mineralogy. Two hours lec. and three hours lab a week. Pr.: GEOL 100 or 105, 130, and CHM 230. GEOL-502-1-5-1914

GEOL 503. Petrology. (3) II. Petrology of igneous, metamorphic, and sedimentary rocks. Two hours lec. and three hours lab a week. Pr.: GEOL 502. GEOL-503-1-5-1914

GEOL 506. Environmental Studies. (2) I, II, S. Physical and chemical qualities of natural environments and health from a geologic perspective—detection and prediction of environmental changes, identification of sources of pollutants and their movements in soils, rocks, and waters. Pr.: GEOL 100. GEOL-506-0-1914

GEOL 510. Geology of Planets. (3) I. Origin, evolution, and surficial geology of the extraterrestrial planets and satellites. Three hours rec. a week. Pr.: GEOL 100. GEOL-510-0-1914

GEOL 512. Earth Science. (3) I, II. A critical study of the atmosphere, weather, climate, composition, and processes of the earth; also, the interaction of these in producing the pattern of landforms and human activity. Three hours rec. a week. Pr.: GEOL 100 or GEOG 220 or junior standing. GEOL-512-1-1917

GEOL 515. Geology of the National Parks. (3) On sufficient demand. Stratigraphy, structure, and geological history that produced the scenery of the national parks. Selected national monuments also will be studied. Pr.: GEOL 100, 105, or 120. GEOL-515-0-1914

GEOL 520. Geomorphology. (2) I, II. Laboratory exercises in reading and interpreting topographic maps and aerial photographs; field studies of landforms and surficial deposits, with an emphasis on earth-surface processes. One hour rec. and three hours lab a week. Pr.: GEOL 100. GEOL-520-1-1914

GEOL 530. Structural Geology. (3) II. Mechanics of the earth's crust; origin and interrelation of structures of the earth. Two hours rec. and three hours lab a week. Pr.: GEOL 503. GEOL-530-1-5-1914

GEOL 540. Recent Earth History. (3) I. Studies of the recent geologic past, especially of the last major ice age to the present. Causes of glaciation and climatic change, ways of reconstructing past geologic environmental and geologic environmental changes during the time when human civilization developed, including recent historic time. Three hours rec. a week. Pr.: GEOL 100 or GEOG 221. GEOL-540-0-1914

GEOL 581. Paleobiology. (4) I. Biological principles applied to fossils; introduction to contributions of pro- and eukaryotic organisms, especially algae and marine invertebrates to earth history. Two hours rec. and six hours lab a week. Pr.: GEOL 300 and 503; MATH 220; PHYS 114. GEOL-581-1-1918

GEOL 599. Senior Thesis. (1-3) I, II. Directed research and preparation of a senior thesis. May be repeated once to a maximum of 3 hours credit. Open only to seniors in geology or geophysics. GEOL-599-4-1914

Undergraduate and graduate credit

GEOL 601. Geologic Presentation. (1) I, II. Application of oral communication techniques to the effective presentation of geologic concepts. One hour rec. a week. Pr.: GEOL 530 and SPCH 105. GEOL-601-0-1914

GEOL 602. Mineral Exploration. (3) I, II. Geological, geochemical, and geophysical prospecting techniques and their application in the exploration for metallic mineral deposits. Three hours rec. a week. Pr.: GEOL 503. GEOL-602-0-1914

GEOL 605. Exploration Geophysics. (3) I. Seismic, gravity, magnetic, and electrical methods used in geophysical exploration for petroleum accumulations and for mineral deposits. Three hours rec. a week. Pr.: PHYS 214; GEOL 530. GEOL-605-0-1916

GEOL 608. Optical Mineralogy-Petrography. (3) I. Identification of minerals and rocks as crushed fragments and in thin section. Two hours lec. and one four-hour lab a week. Pr.: GEOL 503 and PHYS 214 or 114. GEOL-708-1-3-1914

GEOL 610. Sedimentary Geochemistry. (3) I, II. Geochemical principles and processes in deposition and diagenesis of sediments; different chemical pathways in the exogenic cycle. Two hours rec. and three hours lab a week. Pr.: GEOL 503 and MATH 220. GEOL-610-1-1914

GEOL 630. Stratigraphy-Sedimentation. (4) I. Description, classification, correlation, chronology, and paleogeography of sedimentary rock systems and the depositional environments in which they formed. Three hours rec. and three hours lab a week. Pr.: GEOL 581. GEOL-630-1-1914

GEOL 680. Field Geology. (6) S. Geologic mapping projects along the Colorado Front Range using Brunton compass, aerial photographs, topographic maps, and plane table; special problems in stratigraphy, structure, and petrology. Five six-day weeks in the field. Pr.: GEOL 503, 520, and 530. GEOL-680-2-1914

GEOL 702. Economic Geology. (3) I. Geology and origin of metallic mineral deposits and of some nonmetallic deposits. Three hours rec. a week. Pr.: GEOL 503. GEOL-702-1-1914

GEOL 703. Economic Geology Laboratory. (1) I. Laboratory activities related to metallic and nonmetallic mineral deposits, including detailed studies of selected deposits. Pr.: GEOL 702 or conc. enrollment. GEOL-703-1-1914

GEOL 704. Paleocology. (3) I. Application of biological, physical, and chemical factors in modern marine environments to the quantitative study of the structure and dynamics of fossil populations and communities. Two hours rec. and three hours lab a week. Pr.: GEOL 581. GEOL-704-1-1918

GEOL 705. Geobiology. (3) II. Discussion and critique of current and classic research in geobiology. Three hours rec. a week. Pr.: GEOL 581. GEOL-705-0-1918

GEOL 711. Water Resources Geochemistry. (2) II. Geochemistry of ground and surface waters; emphasis on mineralogic and hydrologic controls on inorganic constituents and properties. Two hours rec. a week. Pr.: GEOL 503 or AGRON 705 or 755. GEOL-711-0-1915

GEOL 712. Advanced Geochemistry. (3) II. Application of chemical principles to igneous, metamorphic systems; emphasis on equilibria, oxidation-reduction, crystal chemistry, and thermodynamics. Three hours lec. a week. Pr.: GEOL 503 and CHM 500 or 585. GEOL-712-1-5-1914

GEOL 716. Hydrogeology. (3) I, II. Origin, geologic occurrence, and migration of subsurface water; laws governing ground water flow and yield of aquifers. Three hours rec. a week. Pr.: GEOL 520, 530, or 630, or consent of instructor. GEOL-716-0-1914

GEOL 720. Quaternary Geology. (3) II. Quaternary stratigraphy as the framework for studying the geomorphic, climatic, archaeological, and biological changes of the last two million years, with emphasis on the North American record. Three hours rec. a week and one field trip a semester. Pr.: GEOL 630. GEOL-720-0-1914

GEOL 730. Petroleum Geology. (3) I, II. Origin, migration, and accumulation of petroleum; stratigraphy and structure of important fields. Three hours rec. a week. Pr.: GEOL 530 and 630. GEOL-730-0-1914

GEOL 740. Regional Geology. (3) I. Structure and stratigraphy of the major tectonic units of North America. Pr.: GEOL 530, 630. GEOL-740-0-1914

GEOL 770. Subsurface Methods. (3) II. Principles and applications of subsurface geology. Two hours rec. and three hours lab a week. Pr.: GEOL 530 or conc. enrollment. GEOL-770-1-1914

GEOL 790. Problems in Geology. (Var.) I, II, S. Work is offered in mineralogy, paleobiology, paleoecology, stratigraphy, structural geology, igneous, metamorphic, and sedimentary petrology, geomorphology, planetary geology, hydrogeology, geochemistry, and isotope geology. Pr.: Background of courses needed for problem undertaken. GEOL-790-3-1914

Graduate Credit

GEOL 800. Graduate Seminar in Geology. (Var.) I, II. Topics in geology, geochemistry, and geophysics. GEOL-800-3-1914

GEOL 801. Advanced Paleobiology. (2) On sufficient demand. Detailed study of the functional morphology, ecology, biogeography, evolution, and classification of selected groups. Pr.: GEOL 704 or 705. GEOL-801-0-1918

GEOL 804. Igneous and Metamorphic Petrology. (4) On sufficient demand. Selected problems in the petrogenesis of igneous and metamorphic rocks. Three hours lec. and three hours lab a week. Pr.: GEOL 608. GEOL-804-1-5-1914

GEOL 805. Advanced Igneous and Metamorphic Petrology. (2) On sufficient demand. Field and laboratory study of selected problems in the origin of igneous and metamorphic rocks. Pr.: GEOL 804. GEOL-805-1-5-1914

GEOL 806. Sedimentary Petrology. (4) II. Petrography, classification, and origin of terrigenous and chemical sedimentary rocks. Three hours lec. and three hours lab a week. Pr.: GEOL 608. GEOL-806-1-5-1914

GEOL 807. Advanced Sedimentary Petrology. (2) I, II. Field and laboratory study of selected problems in the origin of sedimentary rocks. Pr.: GEOL 806. GEOL-807-1-5-1914

GEOL 810. Isotope Geology. (3) I. Principles, techniques, and applications of natural radioactive isotopes to geochronology; application of isotopes to problems of petrogenesis. Three hours rec. a week. Pr.: GEOL 608 or consent of instructor. GEOL-810-0-1914

GEOL 830. Geotectonics. (3) I. Origin and history of major tectonic elements of the earth, especially their interaction through time. Pr.: GEOL 530. GEOL-830-0-1914

GEOL 840. Planetology. (3) II. Geologic principles applied to a study of the solar system. Pr.: GEOL 530, 712, or consent of instructor. GEOL-840-0-1914

GEOL 880. Clay Mineralogy. (3) II. Geologic occurrences, physical properties, atomic structures, and the identification of clay minerals, including thermal analytical methods and the study of X-ray diffraction patterns. Two hours rec. and three hours lab a week. Pr.: GEOL 503 or 711 or AGRON 515. GEOL-880-1-1914

GEOL 899. Research in Geology, M.S. (Var.) I, II, S. GEOL-899-4-1914

GEOL 999. Research in Geology, Ph.D. (Var.) I, II, S. GEOL-999-4-1914

History

John M. McCulloh,* Head

Professors Frey,* Gray,* Hamscher,* Higham,* Holl,* Jones,* Kren,* Linder,* Mrozek,* and Socolofsky;* Associate Professors Donovan,* Ferguson,* Feyerharm, and Page;* Assistant Professors Daly,* Manson, and Zschoche;* Emeriti: Professors Carey,* Sageser,* and Wilcoxon;* Associate Professor Crawford.*

The history program at Kansas State University appeals not only to majors but to all students seeking a rewarding educational experience. The curriculum includes courses in traditional and nontraditional fields of interest taught by a nationally respected faculty willing to try new and innovative teaching techniques. A program

of speakers, seminars, colloquia, and films supplements the curriculum to stimulate student interest in the discipline of history and how it is expressed.

Undergraduate advisors in the history department maintain up-to-date information regarding requirements of graduate and professional schools and relevant course offerings in history and other departments.

Transfer students

Normally the history department will accept transfer credit for history courses taught at accredited institutions of higher education. In the case of students transferring from community colleges, only courses equivalent to those taught at the freshman-sophomore level at Kansas State University (courses numbered HIST 100 through HIST 299) may receive credit for the history major.

Undergraduate study

Students may earn a B.A. or a B.S. in history using one of the following three options:

History major

Requirements for a history major consist of a minimum of 36 hours in history including HIST 101, The Rise of Europe; HIST 102, The Modern Era; and HIST 586, The Junior Seminar. At least 18 hours of those courses must be numbered 300 or above. The courses must be distributed as follows:

I. The 18 hours of courses numbered 300 or above must include a minimum of 6 hours in each of the following two categories:

A. History of nation-states, diplomacy, politics, or military affairs;

B. Social, economic, cultural or agricultural history; history of science, technology, or religion.

II. Courses taken at any level must also include the following chronological and geographical distribution. (Courses taken to fulfill this requirement may also satisfy the requirements in section I above.)

A. Six hours (in addition to HIST 101) in courses whose primary chronological emphasis is prior to 1800;

B. Six hours in United States history;

C. Three hours in Third-World history.

Double majors and teacher certification

Students earning double majors may satisfy the requirements with 30 hours in history. The remaining 6 hours will be waived by the completion of an additional major. The required courses and the topical, chronological, and geographical distribution apply to the 30 hours of course work in history.

Students majoring in history may also prepare for teacher certification in social studies at the secondary level. They must meet the same requirements as students earning double majors (30 hours in history rather than 36). They should select their courses in consultation with advisors in both the history department and the College of Education to ensure that they meet the requirements of both programs. (See the College of Education section of this catalog for social science certification requirements.) Students seeking certification with a major in history must also include HIST 599, Senior Seminar for Secondary Teachers, among their courses.

Advanced program in history

Certain highly qualified students may elect to define their own programs for the major in consultation with a committee of three faculty members chosen by the student and approved by the head. This program of study should be broadly conceived, not narrowly circumscribed. This option is available only to students seeking a bachelor of arts (B.A.) degree in history. In order to enter this program a student must have a grade point average of 3.5 at the end of the freshman year or later, submit two letters of recommendation and a statement of purpose, and receive approval from the undergraduate studies committee. A student selecting this option must enroll prior to his or her senior year and meet the following minimum requirements:

Write a senior thesis (6 hours credit over one or two semesters);

Pass an oral examination over a specific body of historical knowledge, the scope of which will be defined by the student in consultation with the faculty committee;

Enroll in 30 hours of history courses (24 hours for double majors and teacher education students) including the Junior Seminar to be selected by the student in consultation with the faculty committee. Students are encouraged to supplement regular course offerings with tutorial instruction.

Graduate study

Graduate study leading to the master of arts and doctor of philosophy degrees is offered in most fields, including the history of science and technology, intellectual history, military history, psychohistory, and economic and agricultural history. General requirements for these degrees are set forth in the Graduate School section of this catalog.

Candidates for the master of arts degree must take a course in historiography. If they write a thesis or report they must offer two seminars and pass a written or oral final examination. If they take the nonthesis, nonreport degree, they must offer

three seminars and pass a written final examination.

For the doctor of philosophy degree, candidates must present a general field in European, American, or South Asian history and two special fields in history. The preliminary examinations are both written and oral. Reading proficiency in two acceptable foreign languages is required.

A detailed description of the graduate programs and information regarding financial support may be obtained by writing the head of the department.

The department cooperates with a number of other departments in the South Asia program, which is described in detail in the Secondary Majors and Graduate School sections of this catalog. It also publishes *Journal of the West*.

Facilities for graduate study

The University's Farrell Library has a number of large, specialized collections. In addition, nearby are several excellent research facilities: the Eisenhower Presidential Library, with outstanding holdings relating to the Eisenhower administration and recent military history; the Truman Presidential Library, with valuable collections on the Truman administration, the history of the American presidency, and foreign policy; the Linda Hall Library, emphasizing materials pertaining to the history of science; the library of the United States Army Command and General Staff College at Fort Leavenworth; and the regional Federal Records Center at Kansas City, currently rich in military and civil records and eventually to have a microfilm duplication of the main holdings of the National Archives in Washington.

Courses in history

Undergraduate credit

HIST 100. Introduction to History. (3) I, II. What history is, how it is produced, and what its functions are. Designed for freshmen who want an introductory course which explains the methodology, purposes, and career options of the discipline. HIST-100-0-2205

HIST 101. Western Civilization: The Rise of Europe. (3) I, II, S. Major trends in Western history from the beginnings of European civilization to the end of the seventeenth century. The scope of this course includes classical antiquity, the Middle Ages, the Renaissance, the Reformation, and early modern Europe, but chronological and topical emphases vary with individual sections. Required of all majors in history. Pr.: Not open to juniors and seniors except with consent of instructor. HIST-101-0-2205

HIST 102. Western Civilization: The Modern Era. (3) I, II, S. Principal developments in Western civilization from the beginning of the eighteenth century to the present. The scope of the course includes the Enlightenment, the French Revolution, the Industrial Revolution, nationalism, imperialism, communism, fascism, and the two world wars, but chronological and topical emphases vary with individual sections. Required of all history majors. Pr.: Not open to juniors and seniors except with consent of instructor. HIST-102-0-2205

HIST 103. Overseas European Studies. (2-3) Intercession only; in alternate years. Selected aspects of European history and culture with readings, lectures, and discussions which will relate historical events to places visited. HIST-103-0-2205

HIST 105. Western Civilization: The Rise of Europe (Honors). (3) I, in alternate years. Course description same as HIST 101. HIST-105-0-2205

HIST 106. Western Civilization: The Modern Era (Honors). (3) II, in alternate years. Course description same as HIST 102. HIST-106-0-2205

HIST 200. Topics in History for Freshmen and Sophomores. (1-3) In alternate years. Exploration of the historical dimensions of a particular topic or theme. Topics vary. May be repeated once. HIST-200-0-2205

HIST 250. Russian Culture and Civilization. (3) I, in alternate years. Russia's past and present in the light of principle ideologies with emphasis upon fine arts, literature, music, religion, politics, and education. Equal time will be given to the Tsarist and the Soviet periods. Knowledge of Russian language is not required. Same as MLANG 250. HIST-250-0-2205

HIST 251. History of the United States to 1877. (3) Includes ethnic, social, military, political, economic, diplomatic, and ideological themes. The chronological emphasis varies with instructor. The aim of the course is to achieve a broad understanding of American civilization to 1877. HIST-251-0-2205

HIST 252. History of the United States Since 1877. (3) Ethnic, social, political, economic, and diplomatic history. The goal of the course is to achieve a broad understanding of American civilization since 1877. HIST-252-0-2205

HIST 297. Honors Introduction to the Humanities I. (3) I. Study of selected major works of history, literature, and philosophy which have been of central importance in the Western cultural tradition. Considerable emphasis is placed on classroom discussion and writing interpretive essays. Limited to entering freshmen students. Pr.: Consent of instructor. Same as ENGL 297, MLANG 297, PHILO 297. HIST-297-0-2205

HIST 298. Honors Introduction to the Humanities II. (3) II. Continuation of HIST 297. Pr.: HIST 297 or consent of instructor. Same as ENGL 298, MLANG 298, PHILO 298. HIST-298-0-2205

HIST 350. Gandhi and the Indian Revolution. (3) II, in alternate years. An introduction to Mahatma Gandhi, his life and career in India, England, and South Africa, his techniques of nonviolent struggle, and the revolution which destroyed the British Empire and created the new countries of India and Pakistan. HIST-350-0-2205

HIST 398. Sophomore Honors Seminar in History. (3) In alternate years. Selected topics in history. May be repeated once for credit. Pr.: Membership in honors program or consent of instructor. HIST-398-0-4900

HIST 401. Technology, Science, and History. (3) II, in alternate years. A nontechnical historical survey of the more significant interactions of technology and science with life and thought in the Western world. HIST-401-0-2205

HIST 459. History of Dance in Its Cultural Setting. (3) II, in alternate years. The study of developments and changes in the style, technique, and purpose of ceremonial and theatrical dancing from the Greeks to the present. Emphasis on the interaction between this art and the total culture—social, religious, artistic, and political—in which it is formed. Pr.: Sophomore standing. Same as DANCE 459. HIST-459-0-2205

HIST 460. Dance Styles and Personalities. (3) On sufficient demand. Brief overview of dance, primitive to the Renaissance. Primary focus is on the contributions of persons and styles to the development of the dance, ballet de cour to contemporary trends. Same as DANCE 460. HIST-460-0-2205

HIST 498. Senior Thesis. (3-6) I, II, S. May be repeated once to a maximum of 6 hours credit. Pr.: Senior standing. HIST-498-1-4-2205

HIST 499. Senior Honors Thesis in History. (2) I, II, S. Open only to seniors in the arts and sciences honors program. HIST-499-4-2205

Undergraduate and graduate credit in minor field

HIST 501. Heritage of the Western World. (3) I, II, in alternate years. The heritage and legacies of Western civilization, designed for the nonmajor. Emphasizes broad themes in the evolution of the political, economic, social, cultural, and ideological inheritance. Not for major credit. Pr.: Sophomore standing. HIST-501-0-2205

HIST 503. Overseas European Studies. (2-3) Intercession only; in alternate years. Selected aspects of European history and culture with reading, lectures, and discussions which will relate historical events to the places visited. Pr.: Sophomore standing. HIST-503-0-2205

HIST 504. History of Hinduism. (3) I, in alternate years. Examines one of the world's oldest religions from its origins to the present. Covers the fundamental ideas and practices of Hinduism and the development of related religions such as Buddhism, Jainism, and Sikhism. Pr.: Sophomore standing. HIST-504-0-2205

HIST 505. Introduction to the Civilization of South Asia I. (3) In alternate years. Interdisciplinary survey of the development of civilization in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including consideration of the geographical and demographic context, philosophical and social concepts, social and political institutions, literature and historical movements. Same as ECON 505, POLSC 505, SOCIO 505, ANTH 505. HIST-505-0-2205

HIST 506. Introduction to the Civilization of South Asia II. (3) In alternate years. Interdisciplinary survey of recent and contemporary civilization in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including recent history, current economy, religion, culture, language and literature, geography, social and political structure and ideas. Same as ECON 506, POLSC 506, SOCIO 506, ANTH 506. HIST-506-0-2205

HIST 510. History of Marxism: Theory and Praxis. (3) II, in alternate years. Analysis of the origins of Marxism, stressing the impact of German idealism, French radicalism, utopian socialism, and British industrialization. Development of Marx's thought from the *Philosophical Manuscripts* to *Kapital*. Second half of the course concerns the organization of Marxist parties and movements from the Second International to polycentrism. The course will treat the Marxist-humanist response to Stalinism. Pr.: Sophomore standing. HIST-510-0-2205

HIST 512. Women in European History. (3) I, in alternate years. A study of women in primitive European societies, in preindustrial times, and in the industrial era. Emphasis will be upon the position and role of women within the society. Pr.: Sophomore standing. HIST-512-0-2205

HIST 513. Battles and Leaders. (3) I, in alternate years. The course will emphasize military organization, tactics and strategy, generalship and grand strategy, manpower and logistics, and the wartime ramifications of war on land, at sea, and in the air. Pr.: Sophomore standing. HIST-513-0-2205

HIST 514. World War II. (3) I, in alternate years. Origins, conduct, and consequence of World War II. Films from the TV series "The World at War" form an integral part of the course. Pr.: Sophomore standing. HIST-514-0-2205

HIST 515. History of Sport. (3) In alternate years. The historical development of sport (especially in Europe and North America) including the growth of competition, the rise of mass spectator sports, elitism, and the changing function of sport. History of sport as business and history of the relationship between sport and other institutions. Same as PE 515. Pr.: Sophomore standing. HIST-515-0-2205

HIST 516. History of Science I. (3) I, in alternate years. Scientific activity and thought from antiquity to the end of the sixteenth century, with emphasis on Greek, late medieval, and Renaissance science. No background in science required. Pr.: Sophomore standing. HIST-516-0-2205

HIST 517. History of Science II. (3) II, in alternate years. Science in the seventeenth and eighteenth centuries, with emphasis on Galileo, Newton, philosophies of science, scientific societies, and developments in the physical, biological, and earth sciences, including the relations of science with technology, medicine, religion, exploration, and the enlightenment. No background in science required. Pr.: Sophomore standing. HIST-517-0-2205

HIST 518. Science in the Modern Age. (3) I, in alternate years. Science since the eighteenth century, including major developments in the physical, biological, and earth sciences, and the relations of science to scientific societies, technology, medicine, exploration, religion, and archaeology. No background in science required. Pr.: Sophomore standing. HIST-518-0-2205

HIST 519. Science in America. (3) I, in alternate years. A survey of American science from the colonial era to the present, with special attention to the historical context and the role of institutions and government. Some attention to the social problems faced by scientists and their responses to them. Pr.: Sophomore standing. HIST-519-0-2205

HIST 520. Death and Dying in History. (3) I, II, in alternate years. Examines European and American attitudes toward death and dying in various historical periods. Topics include: death and dying in the European Middle Ages and in nineteenth and twentieth century America, the impact of the Nazi Holocaust on modern opinions about death, suicide as a historical problem, the fear of cancer in modern times, and others. Pr.: Sophomore standing. HIST-520-0-2205

HIST 521. History of Christianity. (3) I, in alternate years. A history of the Christian religion from the era of Jesus Christ to the present with special emphasis on people and ideas. Pr.: Sophomore standing. HIST-521-0-2205

HIST 522. Religion in American History. (3) II, in alternate years. A study of the impact of religion on American culture and of American culture on religion, the Social Gospel and related issues, and the interrelationship of Christianity and politics. Pr.: Sophomore standing. HIST-522-0-2205

HIST 523. A History of the Occult and Witchcraft. (3) In alternate years. A study of the history of the occult and witchcraft in Western civilization with special attention to religious, intellectual, and social issues and influences. Pr.: Sophomore standing. HIST-523-0-2205

HIST 525. Colonial America. (3) In alternate years. About 1450 to 1763. Includes the European background of North American colonization, the rivalry for new world empire, seventeenth century English colonial foundations, and development of the various colonial societies. Pr.: Sophomore standing. HIST-525-0-2205

HIST 526. The American Revolution. (3) In alternate years. Eighteenth century colonial background of the Revolution and the revolutionary era itself, 1763-1789. Stresses ideological and other causes of the Revolution, the course of the war, its social results, the Confederation and its demise. Pr.: Sophomore standing. HIST-526-0-2205

HIST 527. The Early National Period. (3) In alternate years. Foundations of the new nation from the adoption of the Constitution to the conclusion of the War of 1812, approximately 1789-1815. Stresses the contest between Hamiltonians and Jeffersonians for philosophical dominance of institutions; other topics include diplomacy, westward expansion, military developments, the social and intellectual life of the era. Pr.: Sophomore standing. HIST-527-0-2205

HIST 529. Civil War and Reconstruction. (3) I, in alternate years. 1848-1877. Examination of the sectional controversy, the failure of the political system to resolve peacefully the conflict between North and South, the resort to arms, the nature of the post-war settlement. Emphasis is on the attempt of mid-nineteenth-century American leaders to deal with the complex problems of slavery and race. Pr.: Sophomore standing. HIST-529-0-2205

HIST 531. The United States in the Twentieth Century. (3) In alternate years. Examines the creation of modern America, 1890 to the present. Emphasis on the social and cultural roots, and political consequences, of Progressivism, World War I, the Great Depression, World War II, the Sixties, and Post-Vietnam America. Pr.: Sophomore standing. HIST-531-0-2205

HIST 533. Topics in the History of the Americas. (1-3) In alternate years. Provides instructor and students the opportunity to investigate in detail a particular theme, event, or problem in the history of North, Central, or South America. Topics vary. May be repeated for credit. Pr.: Sophomore standing. HIST-533-0-2205

HIST 536. The American West. (3) I, in alternate years. Primary emphasis on the nineteenth century when Americans were rapidly spreading across the continent. Also examines the earlier developments of the frontier and considers the twentieth century role of the trans-Mississippi region. Pr.: Sophomore standing. HIST-536-0-2205

HIST 537. History of the Indians of North America. (3) In alternate years. A discussion of Indian-white relations from 1492 to the present. Special emphasis given to federal government policy and the cultural decline of the native people of North America. Also includes an examination of Indian reservations and urban Indians. HIST-537-0-2205

HIST 538. The Great Plains. (3) II, in alternate years. Concentration on the one-fifth of North America identified as the Great Plains; the development of that region in historic times. Pr.: Sophomore standing. HIST-538-0-2205

HIST 539. Black American History. (3) In alternate years. Blacks in America from the seventeenth century to the present, with special emphasis on political, social, economic, and intellectual developments in the role of the black American and his contributions to American life and culture. Pr.: Sophomore standing. HIST-539-0-2205

HIST 541. Women in American History. (3) II, in alternate years. An overview of women in the history of the United States, emphasizing both important individual women and the changing position of women in American society. Pr.: Sophomore standing. HIST-541-0-2205

HIST 543. The United States and World Affairs, 1776-Present. (3) I, in alternate years. History of U.S. foreign policy since 1776. Stresses the continuity and intellectual foundations of foreign policy. Emphasizes territorial and foreign commercial expansion and American's response to war and revolution in the twentieth century. Pr.: Sophomore standing. HIST-543-0-2205

HIST 544. History of U.S.-Soviet Relations Since 1917. (3) II, in alternate years. History of U.S.-Soviet relations since 1917 with emphasis on WWI and the New Diplomacy; from nonrecognition to recognition, 1921-1933; the Grand Alliance and WWII; origins of the cold war; economic and atomic diplomacy; the Cuban missile crisis; and prospects for detente. Pr.: Sophomore standing. HIST-544-0-2205

HIST 545. War in the Twentieth Century. (3) In alternate years. Considers the military theory and practice, the technology, and the political and ideological constraints of World Wars I and II, the Spanish Civil War, the Korean War, and the Indochinese wars. Students are to gain an understanding of the varieties of military experience in the twentieth century, including civil wars, "total war," and guerrilla warfare. Pr.: Sophomore standing. HIST-545-0-2205

HIST 546. History of American Military Affairs. (3) In alternate years. Deals with the development of military institutions in colonial America and the United States, civil-military relations and conflicts between political constraints and strategic demands, popular attitudes toward the military, and the rise of the military-industrial complex. Pr.: Sophomore standing. HIST-546-0-2205

HIST 548. American Business History. (3) In alternate years. The rise and development of the major commercial, financial, industrial, and transportation enterprises in the United States from the colonial period to the present. Emphasizes the gradual specialization of business through the Civil War, the movement from specialization to combination and integration along vertical/horizontal lines, the conglomerate movement, and the development of multinational enterprises after World War II. Pr.: Sophomore standing. HIST-548-0-2205

HIST 550. American Economic History. (3) In alternate years. Development of the American economy from colonial times to the present including colonial agriculture and mercantilism, the emergence of the factory system, industrial capitalism, large-scale business and agricultural enterprises, classical and Keynesian economics. Pr.: Sophomore standing. HIST-550-0-2205

HIST 552. Studies in American Social History. (3) In alternate years. Exploration in depth of one specific topic in American social history, such as the impact of immigration, the development of cities, the history of labor and the rise of unions, development of the family, of education, or of medicine. Topics vary. May be repeated for credit. Pr.: Sophomore standing. HIST-552-0-2205

HIST 553. History of American Culture. (3) II, in alternate years. Main emphasis is on political, religious, and social thought and ideology, 1620 to present. Pr.: Sophomore standing. HIST-553-0-2205

HIST 555. American Constitutional History. (3) II, in alternate years. Survey of constitutional and legal development from colonial times to the present. English constitutional ideas and the common law in the American colonies, formation of the Constitution, the role of the Supreme Court, development of the modern American legal system, growth of the legal profession, the problem of civil liberties. The course offers insight into the relationship of constitutional-legal institutions to American society. Pr.: Sophomore standing. HIST-555-0-2205

HIST 557. History of American Agriculture. (3) In alternate years. Concentrates on the period since 1850 in an attempt to acquaint the student with the political and economic history of American agriculture. No attempt will be made to present the scientific or technological side of agriculture in detail, but agriculture will be shown in relation to the life of the entire United States. The life of the farmer and his family, the relationship between agricultural changes and other parts of the economy will be part of this course. Special attention will be paid to agriculture in Kansas and the Great Plains. Pr.: Sophomore standing. HIST-557-0-2205

HIST 558. History of Kansas. (3) I, II. Land, people, and cultural developments in Kansas, from the earliest written records to the present. Provides the student with an intimate understanding of the state of Kansas. Pr.: Sophomore standing. HIST-558-0-2205

HIST 560. Latin American Nations. (3) In alternate years. Survey of economic, social, and political developments of the Latin American nations from independence to the present decade with emphasis on Argentina, Brazil, Peru, Chile, and Mexico. Stresses reform and revolution of the last 50 years. Pr.: Sophomore standing. HIST-560-0-2205

HIST 561. Colonial Hispanic America. (3) In alternate years. Iberian and indigenous American background, exploration, conquest, settlement, and development of Latin America. Stresses growth of mestizo culture, colonial styles of living, and wars of independence. Pr.: Sophomore standing. HIST-561-0-2205

- HIST 562. Modern Mexico.** (3) In alternate years. Brief survey of lines of national development, 1821–1910, and major emphasis on the twentieth-century revolution and its reforms (1910–1940) as well as its subsequent implications. Pr.: Sophomore standing. HIST-562-0-2205
- HIST 563. Topics in Comparative History.** (1–3) In alternate years. Investigation in detail of a particular theme, event, or problem in comparative history. Topics vary. May be repeated once for credit. Pr.: Sophomore standing. HIST-563-0-2205
- HIST 564. The Russian Revolutions and the Soviet System** (3) In alternate years. Russia's industrial revolution and its deepening crisis to the present. Emphasis on prospects for constitutional monarchy and a liberal parliamentary order from the revolution of 1905 to 1914, World War I and the February Revolution, social democracy and the roots of Leninism, Bolshevizing Soviet society under war, Communism and the NEP, Stalinism: fulfillment or betrayal of Leninism, the Great Patriotic War and the emergence of the Soviet empire, and de-Stalinization: prospects for the Soviet system. Pr.: Junior standing. HIST-564-0-2205
- HIST 565. History and Culture of Greece.** (3) In alternate years. The rise of civilization in the ancient Near East, the migrations of the Greeks and the Heroic Age, the Greek city-states, commerce and colonization, the Persian invasion, Athens' leadership of Greece, the war between Athens and Sparta, Alexander the Great, and the total Hellenic achievement. Pr.: Sophomore standing. HIST-565-0-2205
- HIST 566. History and Culture of Rome.** (3) In alternate years. Examines the various theories of Rome's origin, the causes, problems, and influences upon the republican government, political and economic problems of Roman expansion, and the Roman world. Various reforms including those of the Gracchi, Caesar, and Augustus. Contact with Greece and the older areas of civilization. The Roman imperial system, the many causes of Rome's fall, and Rome's role as a synthesizer of the ancient classical culture. Pr.: Sophomore standing. HIST-566-0-2205
- HIST 567. Europe in the Middle Ages.** (3) In alternate years. Europe from the fall of the Roman Empire to the thirteenth century. Investigates the conflict and interaction of Roman, Christian, and Germanic ideals and attitudes in the early Middle Ages, and the increasing complexity and sophistication of society, culture, religion, and government of the high Middle Ages. Pr.: Sophomore standing. HIST-567-0-2205
- HIST 568. The Renaissance.** (3) In alternate years. The Italian Renaissance as a major phase in the history of Western civilization and its spread to northern Europe. Pr.: Sophomore standing. HIST-568-0-2205
- HIST 569. The Reformation.** (3) In alternate years. A study of the Protestant, Catholic, and Radical Reformations with special attention to Luther, Calvin, the origins of the Church of England and the Presbyterian Church, the Anabaptists, the Puritans, and Roman Catholic Reform, and the impact of religious developments on the political, economic, social, and intellectual history of the Western world. Covers the period from approximately 1500 to 1660. Pr.: Sophomore standing. HIST-569-0-2205
- HIST 570. Europe in the Seventeenth Century.** (3) I. In alternate years. Surveys the economic, social, political and intellectual history of western Europe in the seventeenth century, a period marked by economic depression, international conflict, and domestic revolutions as well as by cultural achievement. Emphasizes the complex interaction among social groups; the rise of a European state system; the development of constitutional monarchy in England and absolute monarchy in France; and the change in values generated by the scientific revolution. Pr.: Sophomore standing. HIST-570-0-2205
- HIST 571. Revolutionary Europe.** (3) In alternate years. Europe from the death of Louis XIV in 1715 to the fall of Napoleon in 1815. The origins and development of the French Revolution and the Napoleonic legacy, also examines reform and counter-revolutionary movements in England, Italy, Russia, Poland, and the Germanies. Pr.: Sophomore standing. HIST-571-0-2205
- HIST 572. Nineteenth Century Europe.** (3) In alternate years. The history of Europe from the French Revolution to the end of the first World War. Major topics covered will include the rise of conservatism as an ideology and its application in practice, the nature of liberalism and socialism, the impact of science and technology, the origins and course of World War I. Pr.: Sophomore standing. HIST-572-0-2205
- HIST 573. Twentieth Century Europe.** (3) In alternate years. Examines the political, social, and intellectual developments of Europe in the period of the two world wars. Emphasis on the failure of democracy and the rise of competing antidemocratic and nondemocratic mass movements and ideologies. The course will also deal with the attempted system of collective security, its failure, and the origins and course of World War II. Pr.: Sophomore standing. HIST-573-0-2205
- HIST 574. Europe since World War II.** (3) In alternate years. Postwar European society, politics, economy, and culture. The effects of total war on the population; restoration and reconstruction. The influence of the U.S. and U.S.S.R. on Europe. Capitalism, socialism, and communism in technological society. European unity movements and their conflicts with traditional values. HIST-574-0-2205
- HIST 576. European Diplomatic History to Napoleon.** (3) I, in alternate years. The nature, evolution, and functions of the European diplomatic system from 1500 to 1815. Includes a study of the personality and roles of prominent rulers, spies, and diplomats. Analyzes the Greek and Roman diplomatic tradition, international relations during the Middle Ages, the Venetian system, the struggle for European hegemony, the emergence of the Great Powers, the French Revolution, and the Napoleonic empire. Discusses the use of major diplomatic archives and the interpretation of ambassadorial instructions and reports. Pr.: Sophomore standing. HIST-576-0-2205
- HIST 577. European Diplomatic History Since Napoleon.** (3) II, in alternate years. The nature, evolution, and functions of the European diplomatic system from 1815 to the present. Focuses on the Vienna settlement, diplomacy of Bismarck, international developments between the two world wars, and the cold war. Pr.: Sophomore standing. HIST-577-0-2205
- HIST 578. Emperors and Peoples: The House of Hapsburg.** (3) In alternate years. The diplomatic, military, political, economic, and social aspects of the Hapsburg empire in central Europe, the Iberian Peninsula, Italy, and the Netherlands from its foundation to its dissolution in the twentieth century. Pr.: Sophomore standing. HIST-578-0-2205
- HIST 579. England to 1603.** (3) In alternate years. English medieval institutions with some regard to their interrelation when possible. Approached through selected topics including Anglo-Saxon society as a folk culture, Anglo-Norman military customs, English monastic and mystical life, the origins of Parliament, the Reformation, etc. Pr.: Sophomore standing. HIST-579-0-2205
- HIST 580. The British Isles Since 1603.** (3) In alternate years. English society and politics in modern times with reference also to Scotland and Ireland. Emphasis on topics such as the three orders of society (king, lords, and commons), the churches and religion, the appearance of parliamentary sovereignty, the industrial revolution, and the extension of democratic institutions. Pr.: Sophomore standing. HIST-580-0-2205
- HIST 582. Modern Eastern Europe.** (3) In alternate years. Eastern Europe as an ethnically diverse region between the Germanic lands and Russia, emphasizing the impact of both external and internal forces upon the political, socioeconomic, and intellectual development of the various nations. Covers the period from the triumph of the three eastern monarchies over Poland to the Brezhnev Doctrine and Ostpolitik, including the growth of national consciousness and the continuing struggle for political independence. Pr.: Junior standing. HIST-582-0-2205
- HIST 583. History of France, 1400–1715.** (3) In alternate years. France from the conclusion of the Hundred Years War to the death of Louis XIV. French economy, society, and royal administration, and the changes generated in these areas by significant events: the Reformation and the Wars of Religion; the rise of France to world power; peasant uprisings and constitutional crisis; and the reforms of Richelieu, Colbert, and Louis XIV. Trends in art, architecture, and philosophy. Pr.: Sophomore standing. HIST-583-0-2205
- HIST 584. History of France since 1715.** (3) In alternate years. France from the death of Louis XIV to the present. The impact of the French Revolution and the Napoleonic system on the agrarian economy and aristocratic society of the eighteenth century; the evolution of liberalism, socialism, and colonialism; the development of parliamentary democracy and the impact of the Industrial Revolution; the French response to the devastation of World War I, the humiliation of World War II, and the colonial wars of the De Gaulle era. Pr.: Sophomore standing. HIST-584-0-2205
- HIST 586. Junior Seminar.** (3) I, II. An undergraduate seminar that focuses on the intellectual principles of the historical discipline as well as the fundamental research techniques and writing skills used by historians. Each section of the Junior Seminar will center on a particular topic or historical problem. The students will prepare a research paper on a relevant subject of their choice. All history majors must take this seminar to complete the requirements for their degree. HIST-586-0-2205
- HIST 587. Nineteenth-Century Imperial Germany.** (3) In alternate years. Central Europe in the French Revolutionary era, the revolutions of 1848, German unification, imperial Germany, emphasizing social changes, especially the transition from agrarian to industrial society. Pr.: Sophomore standing. HIST-587-0-2205
- HIST 588. Rise and Fall of Nazi Germany.** (3) In alternate years. Examines the political, social, economic, and intellectual developments in Germany from World War I to the end of World War II. The establishment of the Weimar republic, the nature of its democratic system, the flourishing of cultural activities and the attack on democratic theory and practice leading to the establishment of a totalitarian dictatorship. National Socialism and its leader and alternative interpretations of National Socialism. Pr.: Sophomore standing. HIST-588-0-2205
- HIST 590. History through Film.** (3) I, in alternate years. A study of full-length, major production films to show how films can enhance, distort, or obscure our understanding of the past. Emphasizes historical development, using motion pictures as social documents. HIST-590-0-2205
- HIST 591. History of Russia to 1801.** (3) In alternate years. Medieval and early modern Russia with emphasis on the culture of Kievan Rus', the Mongol Yoke, the rise of Moscow, and the emergence of imperial Russia. Emphasizes those trends that contributed to the character of modern Russian society including Orthodoxy, autocracy, serfdom, and westernization. Pr.: Junior standing or consent of instructor. HIST-591-0-2205
- HIST 592. Grandeur and Decline of Imperial Russia.** (3) In alternate years. Russia in the nineteenth century with emphasis on the political, economic, social, and intellectual development of tsarist society. Topics of special concern: origins of the intelligentsia, plans for political reform under absolutism, serfdom and economic development, the legacy of the Great Reforms and counter reforms, origins and evolution of revolutionary populism. Pr.: Junior standing or consent of instructor. HIST-592-0-2205
- HIST 594. History of Geology.** (3) I, in alternate years. Important trends and individuals in geology from the seventeenth century to the present, with emphasis on the nineteenth century. Substantial use will be made of primary sources. Pr.: Sophomore standing. HIST-594-0-2205

HIST 596. Holocaust: The Destruction of the European Jews. (3) I, in alternate years. Analysis of the attempts by the National Socialist government of Germany to exterminate the Jewish population of Europe. Major issues discussed will include: nineteenth-century antidemocratic and antisemitic movements; Hitler's concept of antisemitism and personal sources of Hitler's genocidal policy; evolution of the genocidal policy and its implementation; Jewish resistance and collaboration; long-range consequences of the Holocaust. Pr.: Sophomore standing. HIST-596-0-2205

HIST 597. Topics in European History. (1-3) In alternate years. Provides instructor and students the opportunity to investigate in detail a particular theme, event, or problem in European history. Topics vary. May be repeated for credit. Pr.: Sophomore standing. HIST-597-0-2205

HIST 598. Topics in Non-Western History. (1-3) On sufficient demand. Provides instructor and students the opportunity to investigate in detail a particular theme, event, or problem in non-Western history. Topics vary. May be repeated for credit. Pr.: Sophomore standing. HIST-598-0-2205

HIST 599. Senior Seminar for Secondary Teachers. (3) II. Analysis of the historical content of teaching materials currently in use at the secondary level in public schools to determine the historical validity of the materials. Pr.: Sophomore standing. HIST-599-0-2205

Undergraduate and graduate credit

HIST 617. Theories and Methods of Psychohistory. (3) I, in alternate years. The origin of psychohistory in works by Freud and Neo-Freudians such as Erikson and Lifton, the emerging methods and theories in such areas as psychobiography, history of childhood, large group processes, and the attempts to construct philosophical and ideological systems out of the combination of history and psychology. Same as PSYCH 617. Pr.: Junior standing. HIST-617-0-2205

HIST 648. Naval History. (3) I or II, in alternate years. Ships, technological developments, navies, tactics, warfare, strategy, and the interrelationship between naval thinking and national and international politics. Pr.: Junior standing or consent of instructor. HIST-648-0-2205

HIST 649. Introduction to the History of Aviation. (3) In alternate years. The development of aviation since the Wrights, providing a world view of man's conquest of the air in both human and technological terms including the development of military, commercial, and general aviation. Pr.: Junior standing or consent of instructor. HIST-649-0-2205

HIST 650. Internship in History. (3) I, II, S. Practical professional experience involving at least three weeks in an archive, museum, historical library, or business. Student projects must be approved in advance and a report submitted at the end of the work period. May be repeated once for credit. Pr.: Junior standing. HIST-650-1-2-2205

HIST 655. Medieval Religion and Politics. (3) In alternate years. The interrelationship of religion and politics from the late Roman Empire to the Conciliar Epoch. Christianity in the Roman Empire and the barbarian kingdoms, the development of royal theocracy, the rise of the papacy, the conflict of church and state, the secularization of government, the Avignon papacy, the Great Schism, and conciliarism. Pr.: Sophomore standing. HIST-655-0-2205

HIST 703. Overseas European Studies. (2-3) Intersession only; in alternate years. Short-term, intensive, and in-depth study of various aspects of European history and culture with readings, lectures, discussions, and on-the-spot experiences which will relate historical events to the places visited. Pr.: Senior or graduate standing. HIST-703-0-2205

HIST 798. Readings in History. (1-3) Students will read on a central theme, attend weekly discussions, and write a final report. HIST-798-3-2205

HIST 799. Problems in History. (Var.) Intensive study of a particular phase of history. Students will attend weekly discussions and write a major research paper on their findings. HIST-799-3-2205

Graduate credit

HIST 801. Historiography. (3-4) Main currents in historical research, the writing of history, and the influence of the great historians from Herodotus to the present. Required of all graduate students in history. HIST-801-0-2205

HIST 899. Master's Research in History. (Var.) HIST-899-4-2205

HIST 901. Advanced Historiography. (1-4) Advanced work offered on demand and by arrangement, in main currents in historical research, the writing of history, and the influence of great historians. HIST-901-4-2205

HIST 903. Renaissance and Reformation Europe. (3) In alternate years. An examination of the major historical problems and literature. HIST-903-0-2205

HIST 904. Early Modern Europe. (3) In alternate years. An examination of the major historical problems and literature. HIST-904-0-2205

HIST 905. Nineteenth-Century Europe. (3) In alternate years. An examination of the major historical problems and literature. HIST-905-0-2205

HIST 906. Twentieth-Century Europe. (3) In alternate years. An examination of the major historical problems and literature. HIST-906-0-2205

HIST 919. Seminar in History of Christianity. (3) HIST-919-0-2205

HIST 920. Seminar in American Social History. (3) HIST-920-0-2205

HIST 921. Seminar in Latin American History. (3) HIST-921-0-2205

HIST 922. Seminar in American Diplomatic History. (3) HIST-922-0-2205

HIST 923. Seminar in the History of the American West. (3) HIST-923-0-2205

HIST 924. Seminar in Colonial America. (3) HIST-924-0-2205

HIST 926. Seminar in American Economic History. (3) HIST-926-0-2205

HIST 927. Seminar in American Science and Technology. (3) HIST-927-0-2205

HIST 928. Seminar in American History. (3) HIST-928-0-2205

HIST 930. Seminar in Modern European History. (3) HIST-930-0-2205

HIST 931. Seminar in German History. (3) HIST-931-0-2205

HIST 932. Seminar in French History. (3) HIST-932-0-2205

HIST 933. Seminar in European Diplomatic History. (3) HIST-933-0-2205

HIST 935. Seminar in Modern Russian History. (3) HIST-935-0-2205

HIST 936. Seminar in Renaissance and Reformation. (3) HIST-936-0-2205

HIST 937. Seminar in British History. (3) HIST-937-0-2205

HIST 940. Seminar in Military History. (3) HIST-940-0-2205

HIST 950. Seminar in South Asian History. (3) HIST-950-0-2205

HIST 979. Seminar in the History of Science. (3) HIST-979-0-2205

HIST 980. Topics in European History. (1-3) HIST-980-0-2205

HIST 981. Topics in Third World History. (1-3) HIST-981-0-2205

HIST 982. Topics in the History of Science. (1-3) HIST-982-0-2205

HIST 983. Topics in Military History. (1-3) HIST-983-0-2205

HIST 984. Topics in American History. (1-3) HIST-984-0-2205

HIST 985. Readings in History. (1-3) HIST-985-3-2205

HIST 986. Problems in History. (1-3) HIST-986-3-2205

HIST 987. Topics in History of Publishing. (3) A historical introduction and training in the central means by which historical knowledge is transmitted in written format. Pr.: Graduate standing. HIST-987-0-2205

HIST 999. Ph.D. Research in History. (Var.) HIST-999-4-2205

Journalism and Mass Communications

Carol Oukrop, Director
Paul Parsons, Associate Director

Professors Marsh,* Nelson,* and Oukrop;* Associate Professors Chastain, Daly, Holt, MacFarland,* Parsons,* Pearce, and Prince,* Assistant Professors Adams,* Deitch, Freeland, Johnson, Puntney, and White.

Journalism and mass communications encompasses the broad field of journalism, advertising, public relations, and radio-television. Students follow a general course of study in the College of Arts and Sciences and a specialized professional curriculum in the A.Q. Miller School of Journalism and Mass Communications. The general college curriculum prepares students to be knowledgeable persons in a complicated world. The professional curriculum educates students in skills, theory, ethics, and other essentials for a mass communications career.

The program offers a hands-on education that provides students with practical experience. Majors have access to the *Kansas State Collegian*, the student newspaper published five days a week, and to the *Royal Purple* yearbook. In 1989, the Columbia Scholastic Press Association awarded the *Collegian* the Gold Crown Award, recognizing it as one of the two best four-year collegiate dailies in the nation. Twice since 1984, the *Collegian* and the *Royal Purple* have won the prestigious national Pacesetter Awards, making K-State the first school in the nation ever to have its newspaper and yearbook win the awards the same year. On the broadcast side, majors have access to campus radio station KSDB-FM, which covers a four-county area, and to television studio and field equipment for producing programming for cable television and for the Kansas

Regents Educational Communications Center. This programming is distributed nationally via the ECC satellite uplink. The school also has a photo lab, a word-processing lab, and a computer graphics lab.

The JMC program is housed in Kedzie Hall, with radio-television studios and offices in McCain Auditorium and the Educational Communications Center.

Undergraduate study

Students in journalism and mass communications must fulfill the general requirements of the College of Arts and Sciences for either a B.S. or a B.A. degree. Beyond this, they develop individualized programs within the framework of a liberal arts education.

All majors are required to achieve a 2.5 grade point average in journalism and mass communications courses in order to qualify for graduation. Courses in JMC are in two areas: those which focus on the relationship of mass communications to society and those designed for professional training and skill development. Passage of the JMC Language Skills Exam is required of all majors for entry into all professional training and skills courses.

A major requires a minimum of 30 credit hours within JMC and a minimum of 90 non-JMC hours, 15 of which must be an outside concentration in a supporting discipline. No more than two courses of the outside concentration may also be used to fulfill general arts and sciences requirements. At least two of the courses in the outside concentration must be 500 level or above or have a prerequisite in the department chosen for the concentration. Of the 90 non-JMC hours, at least 65 must be in the basic liberal arts and sciences.

A curriculum guide for majors is available in 104 Kedzie Hall.

Journalism and mass communications major

All JMC majors are required to complete ECON 110, Economics I, and EDCI 217, Introduction to the Library, and the following courses:

| | | |
|---------|---|---|
| JMC 235 | Introduction to Mass Communications | 3 |
| JMC 275 | News and Feature Writing | 3 |
| JMC 665 | Law of Mass Communications | 3 |

Courses listed under one of the following options are also required:

Journalism option (print or broadcast)

| | | |
|---------|---|---|
| JMC 300 | Editing and Design | 3 |
| JMC 380 | Advanced News and Feature Writing | 3 |
| JMC 480 | Advanced Editing and Design | 3 |
| JMC 600 | Public Affairs Reporting | 3 |
| | or | |
| RTV 240 | Audio I | 3 |
| RTV 320 | Fundamentals of RTV Performance | 3 |

| | | |
|---------|---|-----|
| RTV 330 | Broadcast News Writing | 3 |
| JMC 600 | Public Affairs Reporting | 3 |
| | Public relations option | |
| JMC 300 | Editing and Design | 3 |
| JMC 380 | Advanced News and Feature Writing | 3 |
| JMC 515 | Fundamentals of Public Relations .. | 3 |
| JMC 635 | Public Relations Techniques | 3 |
| JMC 642 | Public Relations Campaigns | 3 |
| JMC 550 | Mass Communications Internship | 1-3 |

Advertising option

| | | |
|---------|--|---|
| JMC 320 | Principles of Advertising | 3 |
| JMC 545 | Advertising Media | 3 |
| JMC 555 | Advertising Copy and Layout | 3 |
| RTV 620 | Electronic Media Advertising Sales | 3 |
| JMC 640 | Advertising Campaigns | 3 |

General option

| | | |
|---------|--|---|
| JMC 300 | Editing and Design | 3 |
| JMC 320 | Principles of Advertising | 3 |
| JMC 380 | Advanced News and Feature Writing | 3 |
| JMC 660 | History of Journalism | 3 |
| | or | |
| JMC 685 | The Mass Communicator: Ethics and Issues | 3 |

Radio-television major

All RTV majors are required to complete ECON 110, Economics I, and EDCI 217, Introduction to Library, and the following courses:

| | | |
|---------|---|---|
| JMC 235 | Introduction to Mass Communications | 3 |
| RTV 237 | Writing for the Electronic Media ... | 3 |
| RTV 240 | Audio I | 3 |
| RTV 250 | Video I | 3 |
| RTV 490 | Senior Seminar | 3 |

and one of the following:

| | | |
|---------|----------------|---|
| RTV 340 | Audio II | 3 |
| RTV 350 | Video II | 3 |

and one of the following:

| | | |
|---------|----------------------------------|---|
| RTV 620 | Electronic Media Ad Sales | 3 |
| RTV 630 | Electronic Media Programming ... | 3 |
| RTV 685 | Electronic Media Management ... | 3 |

and one of the following:

| | | |
|---------|--|---|
| JMC 530 | Ethnic Media in America | 3 |
| JMC 560 | Non-Traditional Press | 3 |
| JMC 612 | Women and the Media | 3 |
| JMC 660 | History of Journalism | 3 |
| RTV 660 | History of Telecommunications ... | 3 |
| RTV 665 | Radio-Television Rules and Regulations | 3 |
| JMC 670 | International Communications | 3 |
| JMC 685 | The Mass Communicator: Ethics and Issues | 3 |
| JMC 730 | Seminar in the Future of the Media | 3 |
| JMC 740 | Colloquium in Mass Communications | 3 |

Agricultural journalism major

Students may enroll in the College of Agriculture and earn a major in agricultural journalism by taking courses in JMC. See the College of Agriculture section of this catalog for details.

Human ecology and mass communications

Students may enroll in the College of Human Ecology and earn a degree in human ecology and mass communications with options in journalism and mass communications or radio-television. See the College of Human Ecology section for details.

Journalism education

Students may satisfy requirements to teach journalism in public schools by either of the following programs: B.A. or B.S. in the College of Arts and Sciences and teacher certification; B.S. in the College of Education with journalism concentration. Under the first option students qualify for teacher certification by completion of specified courses in the College of Education. See the College of Education section of this catalog for details.

Credit through quiz-out

Any student may apply to test out of professional practice courses in journalism and mass communications by presenting to the JMC director a portfolio or tapes or other suitable evidence of performance which would allow assessment of course-related experience. After review of the material, the director may refer the application to the appropriate instructor who will determine the number of credit hours, if any, and the method of examination or evaluation to be employed to determine whether credit shall be given. Such credit shall be granted on a Credit/No Credit basis, and the student may specify whether such credit is to be presented for graduation. No more than 12 semester hours may be earned through quiz-out and at least 18 of the student's journalism credit hours must be KSU resident hours.

Transfer students

Students transferring to the undergraduate program in journalism and mass communications at Kansas State University may transfer a maximum of 12 semester hours in the major. Courses in journalism and mass communications above the 12-hour maximum may not be accepted as electives outside the major and will not be accepted as part of the graduation requirement. No journalism and mass communications course will transfer to KSU without a grade of C or better.

The JMC program will not honor an accumulation of credits in journalism and mass communications courses which consist of laboratory work only. JMC will review the work presented by the transfer student and may accept a maximum of 3 credit hours for all such work, equivalent to courses such as publications practices or radio-television participation.

No transfer credit will be given for Editing and Design, Advanced News and Feature Writing, or Law of Mass Communications unless such work was taken at a college or university accredited in journalism by the Accrediting Council on Education for Journalism and Mass Communications.

Graduate study

Graduate students in mass communications at Kansas State University may work toward the M.S. degree in mass communication.

Courses provide for professional practice along with studies in research methods and in communication process and theory. Students are encouraged to plan a program of study to help meet individual goals in such areas of interest as journalism, public relations, advertising, and radio-TV management.

Students whose undergraduate major is not in journalism or radio-TV may be admitted provisionally, with a requirement to complete basic undergraduate courses along with their graduate work.

The master of science in mass communication requires a minimum of 30 graduate-level hours. Eighteen of the 30 hours must be at the 700 level or above, and 15 of these hours must be from JMC/RTV. The M.S. degree requires the following:

| | | |
|---|---|---------|
| JMC 765 | Communication Theory | 3 |
| JMC 780 | Research Methods | 3 |
| RTV 850 | Applied Research in Mass Media | 3 |
| JMC/RTV electives at the 700 level or above | | 6 |
| STAT 702 | Statistical Methods for Social Sciences | 3 |
| Thesis or report | | 6 or 2 |
| Graduate-level electives | | 6 or 10 |

In addition, graduate students must complete written comprehensive examinations and a final oral examination.

Additional details are included in the JMC guide to graduate study, available in 104 Kedzie Hall.

Courses in journalism

Undergraduate credit

JMC 235. Introduction to Mass Communications. (3) I, II. A historical, social, legal, economic, and technological study of mass communications. Current practices and responsibilities, consumer rights, and career opportunities will be detailed. JMC-235-0-0601

JMC 275. News and Feature Writing. (3) I, II, S. Instruction in information gathering and writing techniques for the various media. Pr.: JMC 235 or conc. enrollment, passage of the JMC Language Skills Exam, and ability to type 30 words a minute. JMC-275-1-4-0602

JMC 300. Editing and Design. (3) I, II. Survey of graphic arts principles; fundamentals of the editing process; relationship of the graphic arts principles to the elements of newspaper design and the total editing function. Pr.: JMC 275 with grade of C or better and passage of the JMC Language Skills Exam. JMC-300-1-4-0602

JMC 310. Photography I. (3) I, II, S. Basic camera and laboratory techniques of photography. Not open to students who have taken JMC 315. JMC-310-1-4-0602

JMC 315. Color Photography. (3) II. Introduction to the advanced 35 mm camera in producing color slides. On-location photography; no processing. Students supply 35 mm camera and film. Not open to those students who have taken JMC 310. JMC-315-0-0602

JMC 320. Principles of Advertising. (3) An examination of the advertising field and its relationship to marketing and journalism. JMC-320-0-0602

JMC 360. Publications Practice. (1-4) Practical work in newspaper and yearbook production, and photography on student publications under supervision of an instructor. Three hours lab a week for each hour of credit. Pr.: Consent of instructor. JMC-360-2-0602

JMC 370. Newspaper Advertising Sales. (3) Basics of newspaper advertising such as design, copy writing, production, sales, budgeting, and legal and ethical issues. Pr.: JMC 320 and consent of instructor. JMC-370-1-0602

JMC 380. Advanced News and Feature Writing. (3) Three hours rec. and six hours reporting for the *Kansas State Collegian* each week. Pr.: JMC 300 with grade of C or better and passage of the JMC Language Skills Exam. Must be completed before senior year. JMC-380-1-2-0602

JMC 399. Honors Seminar in Mass Communications. (3) Pr.: Honors students only; consent of supervising instructor. JMC-399-0-0601

JMC 480. Advanced Editing and Design. (3) Advanced study of the editing processes with emphasis on handling the story, writing headlines, use of all elements for packaging the news, and creative use of the editing tools. Two hours of rec. and six hours editing for the *Kansas State Collegian* each week. Pr.: JMC 380 with grade of C or better. JMC-480-1-2-0602

JMC 499. Seminar Honors Thesis. (2) Pr.: Honors students only; consent of supervising instructor. JMC-499-4-0601

Undergraduate and graduate credit in minor field

JMC 500. Topics in Mass Communication. (1-3) Selected topics in mass communication research and practice. JMC-500-0-0601

JMC 510. Yearbook Editing and Management. (2) Planning, editing, layout, writing, and financing a publication. JMC-510-1-4-0602

JMC 512. Introduction to Public Relations. (3) Media, methods, principles, and practices of public relations. For nonmajors only. Pr.: Junior standing. JMC-512-0-0602

JMC 515. Fundamentals of Public Relations. (3) Management of communications between an organization and its publics. Pr.: JMC 275 with a grade of C or better and passage of the JMC Language Skills Exam. JMC-515-0-0602

JMC 530. The Ethnic Media in America. (3) Consideration of the growth, development, and current status of the ethnic media in the United States. Pr.: Junior standing. JMC-530-0-0602

JMC 535. Photojournalism. (1-3) I. The materials, principles, and processes of photography directed toward visual reporting in newspapers, magazines, and other media. Content and credit vary. Potential topics include documentary picture story, essay, and sequence; spot news, feature, and sports photography; combining words and pictures effectively; marketing techniques; legal restrictions. Lectures, demonstrations, and laboratory. Pr.: JMC 275 and JMC 310 with grades of C or better and access to a 35 mm or 2 1/4 × 2 1/4 camera. May be repeated for a maximum of 4 semester hours. JMC-535-1-0602

JMC 545. Advertising Media. (3) I, II. The selecting, scheduling, selling, and buying of the various advertising media. Pr.: JMC 275 and JMC 320 with grades of C or better and passage of the JMC Language Skills Exam or, for nonmajors, consent of instructor. JMC-545-0-0602

JMC 550. Mass Communications Internship. (1-3) The student works in a professional capacity under proper professional and faculty supervision with reports from student and supervisor required. Pr.: Twelve semester hours of JMC courses and consent of instructor. JMC-550-2-0601

JMC 555. Advertising Copy and Layout. (3) The creating, designing, and writing of advertising copy for the print media stressing the production of a workable advertising campaign. Pr.: JMC 320 with grade of C or better. JMC-555-1-7-0602

JMC 560. Non-Traditional Press. (3) A study of the changing journalistic attitudes toward objectivity in the 1960s and since. Examination of the resulting resurgence and development of alternative, minority, underground, and counterculture media. Techniques, style, impact, use, and consequences to the media and society of the new journalism will be analyzed. JMC-560-0-0602

Undergraduate and graduate credit

JMC 600. Public Affairs Reporting. (3) Investigative reporting of local, state, and national affairs. Pr.: JMC 380. JMC-600-0-0602

JMC 605. Supervision of School Publications. (3) A methods course for those planning to teach secondary or junior college journalism courses and advise high school or junior college publications. JMC-605-0-0602

JMC 610. Interpretation of Contemporary Affairs. (3) Critical questions of the day and interpretive articles and editorials which document and analyze the news. Pr.: JMC 380. May be repeated once for credit with written permission of instructor and department head required. JMC-610-0-0602

JMC 612. Women and the Media. (3) Women as portrayed by and employed by the media. Pr.: Junior standing and one course in JMC or women's studies. JMC-612-0-0602

JMC 615. Magazine Article Writing. (3) Preparation of feature stories and articles; techniques of market analysis, and marketing of articles written in course. Pr.: JMC 380. JMC-615-0-0602

JMC 620. Magazine Production. (3) The practical application of theory to writing, editing, graphic reproduction, layout, and management of magazines. Pr.: JMC 380. JMC-620-0-0602

JMC 625. Public Opinion. (3) Role of interpersonal communication and mass communication on public opinion. Practical survey experience. Pr.: Junior standing and consent of instructor. JMC-625-0-0602

JMC 630. Public Relations Case Studies. (3) Study of historic and contemporary public relations situations using a case-method approach. Attention is directed at strategic planning and implementation by public relations managers. Students establish criteria on what constitutes a public relations program and theories and norms for the selection of objectives and strategies under varying conditions. Pr.: JMC 515 with grade of C or better. JMC-630-0-0602

JMC 635. Public Relations Techniques. (3) Application of the principles of public relations to actual and hypothetical cases. Emphasis on communications techniques used in public relations. Pr.: JMC 515 with a grade of C or better and passage of the JMC Language Skills Exam. JMC-635-0-0602

JMC 640. Advertising Campaigns. (3) The managerial development and execution of consumer, industrial, and institutional advertising campaigns. Pr.: JMC 545 and JMC 555 with grades of C or better; senior standing. JMC-640-0-0602

JMC 642. Public Relations Campaigns. (3) In-depth study of an organization's public relations, to include analyzing the situation, planning a program, and designing specific communications. Pr.: JMC 635 with grade of C or better; senior standing. JMC-642-0-0602

JMC 650. Newspaper Management. (3) The management of newspapers dealing with organization, ownership, promotion, research, production, equipment, markets, personnel, legal aspects, advertising, buying and selling of newspaper properties, business practices, and news policy. Pr.: JMC 480 or conc. enrollment. JMC-650-0-0602

JMC 660. History of Journalism. (3) A review of the growth and development of the press in the United States, with attention to the interrelationships of the press and social, economic, and political forces. Pr.: Junior standing or consent of instructor. JMC-660-0-0602

JMC 665. Law of Mass Communications. (3) A study of legal issues relating to mass communications. Emphasis on defamation, privacy, copyright, administrative controls, and other areas related to the mass media. Pr.: Senior standing or consent of instructor. JMC-665-0-0601

JMC 670. International Communications. (3) Comparative study of world press systems and the role of communications in national development. JMC-670-0-0601

JMC 680. Readings in Mass Communications. (1-3) Investigation of the literature of mass communications. Pr.: Minimum of 9 hours of completed course work in JMC, senior or graduate standing, and consent of supervisory instructor. JMC-680-3-0602

JMC 685. The Mass Communicator: Ethics and Issues. (3) A consideration of influences and controls that define the role of the mass communicator in American society. Pr.: Senior standing. JMC-685-0-0602

JMC 690. Problems in Mass Communications. (1-4) Pr.: Background of courses needed for problem undertaken. JMC-690-3-0602

JMC 730. Seminar in the Future of the Media. (3) A study of philosophical and technological advances in mass communications with emphasis on projected patterns of future growth and development. Pr.: Senior or graduate standing. JMC-730-0-0601

JMC 740. Colloquium in Mass Communications. (1-3) Discussion of selected topics in mass communications research and practice. Pr.: Senior or graduate standing. JMC-740-0-0601

JMC 765. Communication Theory. (3) An examination of major communication theories as they relate to individual, interpersonal, group, and mass communications. JMC-765-0-0601

JMC 770. Professional Journalism Practicum. (1-4) For advanced students. Supervised practical work in professional journalism and mass communications. Includes laboratory investigation, field work, and internships. Pr.: JMC 300 or RTV 330 and consent of supervising instructor. JMC-770-2-0602

JMC 780. Research Methods in Mass Communications. (3) Survey of research methods used in the study of the mass media. JMC-780-0-0602

Graduate credit

JMC 899. Research in Mass Communications. (Var.) Pr.: Registration in the Graduate School and sufficient training to carry on the line of research undertaken. JMC-899-4-0602

Courses in radio and television

Undergraduate credit

RTV 237. Writing for the Electronic Media. (3) I, II, S. Study of forms and the preparation of written material for news, commercial announcements, promotion, etc. for the electronic media, and of the regulations concerning advertising copy. Pr.: JMC 235 with a grade of C or better and passage of the JMC Language Skills Exam. RTV-237-0-3-0603

RTV 240. Audio I. (3) I, II, S. Basic instruction in audio for radio and TV, emphasizing laboratory experiences. Pr.: RTV 237 or JMC 275 with grade of C or better. RTV-240-1-0603

RTV 250. Video I. (3) I, II, S. Basic instruction in video production for broadcast TV, cable, and industrial video, emphasizing laboratory experiences as well as lectures. Pr.: RTV 237 with grade of C or better. RTV-250-1-0603

RTV 300. Radio-Television and Society. (3) I, II. Influence of electronic media in today's culture. Examination of the dynamics of telecommunications including production techniques. RTV-300-0-0603

RTV 320. Fundamentals of Radio-Television Performance. (3) I, II. Training in nondramatic radio and television performance, including news, commercials, and interviews. Emphasis on laboratory experience. Pr.: RTV 240 with grade of C or better, SPCH 106 or SPCH 105. RTV-320-1-0603

RTV 330. Broadcast News Writing. (3) Practical experience in gathering, writing, editing, and presenting news for KSDB-FM and cable television, and study of current issues and federal/state regulations and laws. Pr.: JMC 275 and RTV 240 with grades of C or better. RTV-330-1-5-0603

RTV 340. Audio II. (3) I, II. Theory and practice of radio remotes, automation, and multichannel recording and editing in the production of commercials, dramatic narrative, and documentary programs. Pr.: RTV 240 with grade of C or better. RTV-340-1-0603

RTV 350. Video II. (3) I, II. Advanced techniques in television production. Lectures and group projects. Emphasis on organizing video production from the viewpoint of producers and directors. Pr.: RTV 250 with grade of C or better. RTV-350-1-0603

RTV 355. KSDB Audition. (0) I, II. Production of music, news, and/or sports audio tapes to be evaluated by faculty in preparing students for an on-air position with KSDB-FM. RTV-355-5-0603

RTV 460. KSDB Participation. (1-3) I, II, S. Supervised participation in the university's student FM radio station, emphasizing music announcing, board production, recorded production, news and sports play-by-play, and FCC operating regulations. Pr.: RTV 355. RTV-460-5-0603

RTV 475. Video Participation. (1-3) I, II. Supervised participation in program production for entertainment, news, and industrial videos. Scripted, supervised group projects. Three hours of lab participation a week required for each hour of credit. Pr.: RTV 250. RTV-475-5-0603

RTV 490. Senior Seminar. (3) II. Current issues in electronic media, including regulation, law, technology, and programming. Preparation for graduation and employment. Pr.: Senior majors only. RTV-490-0-0603

RTV 540. Advanced Reporting for the Electronic Media. (3) Reporting of issues of local importance, information-gathering techniques, in-depth writing, and electronic media news production methods. Pr.: RTV 330. RTV-540-0-0603

Undergraduate and graduate credit

RTV 620. Electronic Media Advertising Sales. (3) I. Retail advertising applied to radio, television, and cable systems. Retail ad campaigns, media buying, selling techniques. FTC and FCC ad regulations covered. Pr.: JMC 320 or MKTG 400 with a grade of C or better. RTV-620-0-0603

RTV 630. Electronic Media Programming. (3) I. The principles, planning, and development of radio-television-cable programs, schedules, and related regulation. Pr.: RTV 237 with grade of C or better. RTV-630-0-0603

RTV 660. History of Telecommunication. (3) History of the telecommunication industries; their effects on American life; the economic, political, and social significance of electronic media. Pr.: Junior standing. RTV-660-0-0603

RTV 665. Radio-Television Regulation and Responsibility. (3) II. The major laws and legal decisions which affect broadcasting and cable, with attention to the Federal Communication Act, rules and regulations, and other laws relating to broadcasting and cable management. Pr.: Senior standing. RTV-665-0-0603

RTV 675. Radio-Television Criticism. (3) II. The principles and criteria of mass media criticism, with emphasis on broadcasting. Pr.: Junior standing. RTV-675-0-0603

RTV 685. Electronic Media Management. (3) II. Management practices of broadcast, cable, and nonbroadcast facilities including regulation and sales. Pr.: MANGT 420 or RTV 237 with grade of C or better. RTV-685-0-0603

Graduate credit

RTV 850. Applied Research in Mass Media. (3) II. Study and application of mass media research, its literature and methodology. Pr.: Graduate or senior standing. RTV-750-0-0603

Mathematics

Louis Pigno,* Head

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Mathematics is the unparalleled model of an exact science, the epitome of creative art, and a language essential to understanding our modern technological world.

Mathematics graduates are sought both for their specialized knowledge and for their ability to think analytically. Mathematics is an excellent major for pre-professionals and for liberal arts students who desire a major that combines a flexible program with an in-depth study of fertile subject matter and analytic methodology.

Undergraduate study

Students in mathematics may obtain either the B.A. or B.S. degree. For either degree, in addition to the requirements of the University and college, students must take:

| | | |
|----------|---|---|
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| | and | |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| | and | |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| MATH 240 | Elementary Differential Equations | 4 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| STAT 510 | Introductory Probability and Statistics I | 3 |
| MATH 512 | Introduction to Modern Algebra ... | 3 |
| | or | |
| MATH 511 | Introduction to Algebraic Systems .. | 3 |
| MATH 633 | Advanced Calculus I | 3 |
| | or | |
| MATH 520 | Foundations of Analysis | 3 |

For the B.S. degree, students must take 15 additional hours in mathematics numbered 400 and above; MATH 570 may not be used to meet this requirement.

For the B.A. degree, students must take 15 additional hours in mathematics numbered 400 or above; PHILO 510 may be substituted for 3 of these hours.

Applied mathematics program

Students who intend to seek employment in business, industry, or government should take Advanced Calculus I and II (MATH 633 and 634) in the junior year. In addition, the following courses are strongly recommended:

| | | |
|----------|---|---|
| MATH 510 | Discrete Mathematics | 3 |
| MATH 551 | Applied Matrix Theory | 3 |
| MATH 630 | Introduction to Complex Analysis | 3 |
| MATH 632 | Elementary Partial Differential Equations | 3 |
| MATH 640 | Ordinary Differential Equations I | 3 |
| MATH 641 | Ordinary Differential Equations II | 3 |
| MATH 655 | Elementary Numerical Analysis I | 3 |

It is recommended that the student also take at least 6 hours of upper-division courses outside the mathematics department in areas such as computer science, engineering, physics, or statistics.

Pre-graduate program

Students who intend to enter graduate school to work toward an advanced degree in either pure or applied mathematics should take as many of the following upper-division mathematics courses as possible:

| | | |
|----------|----------------------|---|
| MATH 700 | Set Theory and Logic | 3 |
| MATH 721 | Analysis I | 3 |
| MATH 722 | Analysis II | 3 |
| MATH 730 | Abstract Algebra I | 3 |
| MATH 731 | Abstract Algebra II | 3 |

It is recommended that the student also take courses in related scientific fields, especially computer science and physics. At least one foreign language, preferably French, German, or Russian, should be studied.

Mathematics education program

Students who intend to become secondary school mathematics teachers may prepare for teacher certification while completing the requirements for a degree in mathematics. A number of upper-division courses offered by the mathematics department are designed particularly for such students. These include:

| | | |
|----------|---|---|
| MATH 511 | Introduction to Algebraic Systems | 3 |
| MATH 520 | Foundations of Analysis | 3 |
| MATH 521 | The Real Number System | 3 |
| MATH 570 | History of Mathematics | 3 |
| MATH 572 | Foundations of Geometry | 3 |
| MATH 791 | Topics in Mathematics for Secondary School Teachers | 3 |

For specific certification requirements for secondary education, see the College of Education section of this catalog.

Students majoring in elementary education who wish to use mathematics as an area of concentration should consider taking their 15 hours of mathematics from among the following courses:

| | | |
|----------|--|---|
| MATH 100 | College Algebra | 3 |
| MATH 110 | Mathematics, Its Form and Impact | 3 |
| MATH 308 | Topics in Mathematics for Elementary School Teachers | 4 |
| MATH 309 | Intuitive Geometry | 2 |
| MATH 312 | Finite Applications of Mathematics | 3 |
| MATH 313 | Computational Number Theory | 3 |

Dual majors and dual degrees

Students may major in mathematics and another discipline within the College of Arts and Sciences. The degree requirements of both departments must be met.

Students may obtain a dual degree in mathematics and a field in another college such as business administration or engineering. The degree requirements of both colleges must be met and a minimum of 150 hours must be completed.

Information for nonmajors

Most colleges and departments require at least one mathematics course. Students should check with their advisors to determine which mathematics courses to take. Advisors are provided information that will aid them in using the student's ACT score to select the appropriate entry-level mathematics course. Advisors also have access to extended mathematics course descriptions that will help them to advise students.

Graduate study

The Department of Mathematics offers work leading to the degrees of master of science and doctor of philosophy. Students planning a career in college or university teaching or research in mathematics should plan a program leading to an advanced degree. For admission to graduate work in mathematics, a student should have completed work in mathematics equivalent to what is required for a B.S. or B.A. degree at KSU with a B average or better.

Prospective graduate students whose undergraduate training does not meet these requirements may be admitted on a provisional basis. Such students are required to remedy deficiencies in undergraduate preparation by completing the undergraduate courses without receiving graduate credit. University requirements for advanced degrees are given in the Graduate School section of this catalog. Information on mathematics departmental programs and requirements and on facts concerning courses offered during the summer term may be obtained by writing to the Department of Mathematics, 137 Cardwell Hall, Manhattan, Kansas 66506-2602.

Courses in mathematics

MATH 010. Intermediate Algebra. (3) I, II, S. Review of elementary algebra; topics preparatory to MATH 100. Pr.: One unit of high school algebra. MATH-010-0-1701

Undergraduate credit

MATH 100. College Algebra. (3) I, II, S. Pr.: Plane geometry and satisfactory placement test score in algebra. Students with one and one-half entrance units of algebra should normally be eligible for this course. MATH-100-0-1701

MATH 101. The Metric System. (1) Intersession only, on sufficient demand. A systematic study of the metric system including historical background of various systems, structure of the metric system itself, and relation to existing systems; attention on competent use of metric terms in problem solving. MATH-101-0-1701

MATH 110. Mathematics, Its Form and Impact. (3) I, II, S. This course requires no mathematical background. It includes the development and analysis of mathematical structures; applications of the structures are used to exemplify the linguistic use of mathematics and its impact on society. MATH-110-0-1701

MATH 150. Plane Trigonometry. (3) I, II, S. Trigonometric and inverse trigonometric functions; trigonometric identities and equations; applications involving right triangles and applications illustrating the laws of sines and cosines. Pr.: One unit plane geometry and one and one-half units of high school algebra. MATH-150-0-1701

MATH 199. Freshman Mathematics Seminar. (1) I. Topics of special interest to freshmen in mathematics, including orientation to the mathematics curriculum, possible careers in mathematics, and cultural and professional aspects of mathematics. MATH-199-2-1701

MATH 201. Elementary Applied Mathematics. (3) I, II. Applications of precalculus mathematics with emphasis on the techniques of problem solving. Pr.: One and one-half years of high school algebra, one year of high school geometry, one-half year of high school trigonometry, and satisfactory placement test score. MATH-201-0-1701

MATH 205. General Calculus and Linear Algebra. (3) I, II. Introduction to calculus and linear algebra concepts that are particularly useful to the study of economics and business administration with special emphasis on working problems. Pr.: MATH 100 with C or better grade (College Algebra in the preceding semester is recommended). MATH-205-0-1701

MATH 210. Technical Calculus I. (3) I, II. A condensed course in analytic geometry and differential calculus with an emphasis on applications. Pr.: MATH 150 or two years of high school algebra and one semester of high school trigonometry. MATH-210-0-1701

MATH 211. Technical Calculus II. (3) I, II. A continuation of MATH 210 to include integral calculus with an emphasis on application. Pr.: MATH 210. MATH-211-0-1701

MATH 220. Analytic Geometry and Calculus I. (4) I, II, S. Analytic geometry, differential and integral calculus of algebraic and trigonometric functions. Pr.: MATH 150 or two years of high school algebra and one semester of high school trigonometry. MATH-220-0-1701

MATH 221. Analytic Geometry and Calculus II. (4) I, II, S. Continuation of MATH 220 to include transcendental functions, technique of integration, and infinite series. Pr.: MATH 220. MATH-221-0-1701

MATH 222. Analytic Geometry and Calculus III. (4) I, II, S. Continuation of MATH 221 to include functions of more than one variable. Pr.: MATH 221. MATH-222-0-1701

MATH 240. Elementary Differential Equations. (4) I, II, S. Elementary techniques for solving ordinary differential equations and applications to solutions of problems in science and engineering. Pr.: MATH 222. MATH-240-0-1701

MATH 308. Topics in Mathematics for Elementary School Teachers. (4) I, II, S. Systems of numeration, sets and numbers, properties of the number system, relations, real numbers, elementary logic, concept of proof, elements of algebra, and statistics. Pr.: Consent of instructor. MATH-308-0-0833

MATH 309. Intuitive Geometry. (2) Intersession only. Measurement, triangles, quadrilaterals, nonmetric geometry, similarity, volumes, elementary coordinate geometry. Pr.: Consent of instructor. MATH-309-0-1701

MATH 312. Finite Applications of Mathematics. (3) II. Systems of equations, vector operations, linear algebra, and linear programming. Practice in setting up, solving, and interpreting mathematical models which arise in social sciences and business. Pr.: MATH 100. MATH-312-0-1701

MATH 313. Computational Number Theory. (3) I, II, S. Topics in number theory selected from: divisibility, primes, modular arithmetic and special types of numbers. Emphasis is on computations. Primarily for prospective elementary school teachers of mathematics. Pr.: Sophomore standing, MATH 100. MATH-313-0-1701

MATH 350. Introduction to Abstract Mathematics. (3) I, II. An introduction to techniques of proving mathematical theorems from set theory, discrete mathematics, number theory, analysis, and algebra. Pr.: MATH 221. MATH-350-0-1701

MATH 398. Sophomore Seminar. (3) II. Seminar in mathematics for honors students. Pr.: Membership in honors program. MATH-398-3-4900

MATH 399. Seminar in Mathematics. (Var.) On sufficient demand. Primarily for honors students. Pr.: Consent of instructor. MATH-399-3-1701

MATH 498. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. MATH-498-3-1701

MATH 499. Undergraduate Topics in Mathematics. (Var.) I, II, S. Reading courses in advanced undergraduate mathematics. Pr.: Background of courses needed for topic undertaken and consent of instructor. MATH-499-3-1701

Undergraduate and graduate credit in minor field

MATH 506. Introduction to Number Theory. (3) II. Divisibility properties of integers, prime numbers, congruences, multiplicative functions. Pr.: MATH 221. MATH-506-0-1701

MATH 510. Discrete Mathematics. (3) I, II, S. Combinatorics and graph theory. Topics selected from counting principles, permutations and combinations, the inclusion/exclusion principle, recurrence relations, trees, graph coloring, Eulerian and Hamiltonian circuits, block designs, and Ramsey Theory. Pr.: Sophomore standing and MATH 221. MATH-510-0-1701

MATH 511. Introduction to Algebraic Systems. (3) I. Properties of groups, rings, domains and fields. Examples selected from subsystems of the complex numbers, elementary number theory, and solving equations. Pr.: MATH 222. MATH-511-0-1701

MATH 512. Introduction to Modern Algebra. (3) I, II. Introduction to the basic algebraic systems, viz., groups, rings, integral domains, fields, elementary number theory. Special emphasis will be given to methods of theorem proving. Pr.: MATH 222 or consent of instructor; MATH 350. MATH-512-0-1701

MATH 515. Introduction to Linear Algebra. (2-3) I. Finite dimensional vector spaces; linear transformations and their matrix representations; dual spaces, invariant subspaces; Euclidean and unitary spaces; solution spaces for systems of linear equations. Pr.: MATH 512. MATH-515-0-1701

MATH 520. Foundations of Analysis. (3) A study of sets and sequences, neighborhood, limit point, convergence, and open and closed set in the real line and in the plane, the concept of continuous function. Pr.: MATH 222. MATH-520-0-1701

MATH 521. The Real Number System. (3) An extensive development of number systems, with emphasis upon structure. Includes systems of natural numbers, integers, rational numbers, and real numbers. Pr.: MATH 221. MATH-521-0-1701

MATH 551. Applied Matrix Theory. (3) I, II. Matrix algebra, solutions to systems of linear equations, determinants, vector spaces, linear transformations, eigenvalues, linear programming, approximation techniques. Pr.: MATH 205 or 220. MATH-551-0-1703

MATH 570. History of Mathematics. (3) II. A survey of the development of mathematics from ancient to modern times. Cannot be used as part of the advanced mathematics needed for the B.S. degree in mathematics. Pr.: MATH 220. MATH-570-0-1701

MATH 572. Foundations of Geometry. (3) Euclidean, non-Euclidean, and finite geometries; role of axioms; practice proving theorems in a formal system; synthetic, metric, and transformation approaches to Euclidean geometry. Pr.: MATH 221. MATH-572-0-1701

MATH 591. Topics in Mathematics for Teachers. (1-3) I, II, S. Topics of importance for teachers of mathematics. May be repeated for credit. Pr.: Consent of instructor. MATH-591-0-1701

MATH 615. Advanced Engineering Mathematics I. (4) I. Linear algebra; topics in ordinary differential equations; complex analysis. Pr.: MATH 222 and MATH 240. MATH-615-0-1701

MATH 616. Advanced Engineering Mathematics II. (4) II. Fourier series; Fourier and Laplace transforms; basic partial differential equations; basic calculus of variations. Pr.: MATH 222 and MATH 240. MATH-616-0-1701

Undergraduate and graduate credit

MATH 630. Introduction to Complex Analysis. (3) I, II. Complex analytic functions and power series, complex integrals. Taylor and Laurent expansions, residues, Laplace transformation, and the inversion integral. Pr.: MATH 240. MATH-630-0-1703

MATH 632. Elementary Partial Differential Equations. (3) I. Orthogonal functions, Fourier Series, boundary value problems in partial differential equations. Pr.: MATH 240. MATH-632-0-1703

MATH 633. Advanced Calculus I. (3) I. Functions of one variable: limits, continuity, differentiability, Riemann-Stieltjes integral, sequences, series, power series, improper integrals. Pr.: MATH 222 and 350. MATH-633-0-1701

MATH 634. Advanced Calculus II. (3) II. Functions of several variables: partial differentiation and implicit function theorems, curvilinear coordinates, differential geometry of curves and surfaces, vectors and vector fields, line and surface integrals, double and triple integrals, Green's Theorem, Stokes' Theorem, and Divergence Theorem. Pr.: MATH 633. MATH-634-0-1701

MATH 640. Ordinary Differential Equations I. (3) I. First order equations and applications, second order equations and oscillation theorems, series solutions and special functions, Sturm-Liouville problems, linear systems, autonomous systems and phase plane analysis, stability, Liapunov's method, periodic solutions, perturbation and asymptotic methods, existence and uniqueness theorems. Pr.: MATH 240. MATH-640-0-1703

MATH 641. Ordinary Differential Equations II. (3) II. Continuation of MATH 640. Pr.: MATH 640. MATH-641-0-1703

MATH 655. Elementary Numerical Analysis I. (3) I. Error analysis, root finding, interpolation, approximation of functions, numerical integration and differentiation, systems of linear equations. Pr.: MATH 221, a computer language, and either MATH 515 or 551. MATH-655-0-1701

MATH 656. Elementary Numerical Analysis II. (3) II. A continuation of MATH 655. Linear programming, numerical solutions of differential equations, and the use of standard packages for the solution of applied problems. Pr.: MATH 655 and MATH 240. MATH-656-0-1701

MATH 670. Mathematical Modeling. (3) Introduction of modeling procedures. Case studies in mathematical modeling projects from physical, biological, and social sciences. Pr.: Four mathematics courses numbered 500 or above. MATH-670-0-1701

MATH 689. Combinatorial Analysis. (3) II, in alternate years. Permutations, combinations, inversion formulae, generating functions, partitions, finite geometries, difference sets, and other topics. Pr.: MATH 512. MATH-689-0-1701

MATH 700. Set Theory and Logic. (3) An introduction to logic, mathematical proof, and elementary set theory; elementary logic, the basic constructions of set theory, relations, partitions, functions, cartesian products, disjoint unions, orders, and a construction of the natural numbers; also ordinal and cardinal numbers, the Axiom of Choice, and transfinite induction. Special emphasis will be given to proving theorems. Pr.: MATH 350. MATH-700-0-1701

MATH 701. Elementary Topology I. (3) I. Introduction to axiomatic topology including a study of compactness, connectedness, local properties, cardinal invariants, and metrizable. Pr.: MATH 700. MATH-701-0-1701

MATH 702. Elementary Topology II. (3) II. Continuation of MATH 701. Pr.: MATH 701. MATH-702-0-1701

MATH 704. Introduction to the Theory of Groups. (3) II. Introduction to abstract group theory; to include permutation groups, homomorphisms, direct products, Abelian groups. Jordan-Hölder and Sylow theorem. Pr.: MATH 512. MATH-704-0-1701

MATH 706. Theory of Numbers. (3) II. Divisibility, congruences, multiplicative functions, number theory from an algebraic viewpoint, quadratic reciprocity, Diophantine equations, prime numbers. Pr.: MATH 221 and either 511 or 512. MATH-706-0-1701

MATH 710. Introduction to Category Theory. (3) Categories, duality, special morphism, functors, natural transformations, limits and colimits, adjoint situations, and applications. Pr.: MATH 701 and MATH 730. MATH-710-0-1701

MATH 711. Category Theory. (3) Set valued functors and concrete categories, factorization structures, algebraic and topological functors, categorical completions, Abelian categories. Pr.: MATH 710. MATH-711-0-1701

MATH 713. Advanced Applied Matrix Theory. (3) II. A development of the concepts of eigenvalues by considering applications in differential equations and quadratic forms. A discussion of the Jordan canonical form, functions of matrices, vector and matrix norms, and various related numerical methods. Pr.: MATH 551 or 515. MATH-713-0-1701

MATH 721. Analysis I. (3) I, II, S. Metric spaces, limits, continuity, sequences and series, connectedness, compactness, Baire category, uniform convergence, theorems of Stone-Weierstrass and Arzela. Pr.: MATH 240 or graduate standing. MATH-721-0-1701

MATH 722. Analysis II. (3) II. Lebesgue and Riemann-Stieltjes integration on the real line, differentiation on the real line, elementary transcendental functions. Pr.: MATH 721. MATH-722-0-1701

MATH 730. Abstract Algebra I. (3) I. Groups, rings, fields, vector spaces and their homomorphisms. Elementary Galois theory and decomposition theorems for linear transformations on a finite dimensional vector space. Pr.: MATH 512 or consent of instructor. MATH-730-0-1701

MATH 731. Abstract Algebra II. (3) II. Continuation of MATH 730. Pr.: MATH 730 or consent of instructor. MATH-731-0-1701

MATH 740. Calculus of Variations. (3) On sufficient demand. Necessary conditions and the Euler-Lagrange equations, Hamilton-Jacobi theory, Noether's theorems, direct methods, applications to geometry and physics. Pr.: MATH 722 or equiv. MATH-740-0-1701

MATH 755. Dynamic Modeling Processes. (3) Topics to include equilibrium and stability, limit cycles, reaction-diffusion, and shock phenomena, Hopf bifurcation and cusp catastrophes, chaos and strange attractors, bang-bang principle. Applications from physical and biological sciences and engineering. Pr.: MATH 240 and 551. MATH-755-0-1701

MATH 772. Elementary Differential Geometry. (3) I. Curves and surfaces in Euclidean spaces, differential forms and exterior differentiation, differential invariants and frame fields, uniqueness theorems for curves and surfaces, geodesics, introduction to Riemannian geometry, some global theorems, minimal surfaces. Pr.: MATH 240. MATH-772-0-1701

MATH 781. Differentiable Manifolds I. (3) I, in alternate years. Differentiable structures, tangent bundles, tensor bundles, vector fields and differential equations, integral manifolds, differential forms, introduction to Lie groups. Pr.: MATH 772 or consent of instructor. MATH-781-0-1701

MATH 782. Differentiable Manifolds II. (3) II, in alternate years. Fibre bundles, theory or connections, linear and affine connections, Riemann manifolds, submanifolds of Riemann manifolds, complex manifolds. Pr.: MATH 781. MATH-782-0-1701

MATH 791. Topics in Mathematics for Secondary School Teachers. (3) Topics of importance in the preparation of secondary school teachers to teach modern mathematics. May be repeated for credit. MATH-791-0-0833

Graduate credit

MATH 801. Numerical Solution of Differential Equations I. (3) I. Single and multistep methods for initial value problems for ordinary differential equations; discretization and round off error; consistency, convergence, and stability of these methods; stiff equations and implicit methods; two point boundary value problems; initial and boundary value problems for partial differential equations; finite difference methods; marching schemes for parabolic and hyperbolic problems; consistency, stability, convergence, and the Lax equivalence theorem; treatment of boundary conditions; boundary value problems for elliptic equations; relaxation, alternating direction, and strongly implicit iterative methods; nonlinear problems; finite element methods. Pr.: MATH 655 and knowledge of a programming language. MATH-801-0-1701

MATH 802. Numerical Solution of Differential Equations II. (3) II. Continuation of MATH 801. Pr.: MATH 801. MATH-802-0-1701

MATH 810. Higher Algebra I. (3) I. Theory of groups, theory of rings and ideals, polynomial domains, theory of fields and their extensions. Pr.: MATH 731. MATH-810-0-1701

MATH 811. Higher Algebra II. (3) II. Continuation of MATH 810. Pr.: MATH 810. MATH-811-0-1701

MATH 821. Real Analysis I. (3) I. Measurability, integration theory, regular Borel measures, the Riesz representation theorem, and Lebesgue measure in Euclidean spaces. Pr.: MATH 722. MATH-821-0-1701

MATH 822. Real Analysis II. (3) II. The L^p -spaces, Banach spaces, and Hilbert spaces, complex measures and the Radon-Nikodym theorem, the Fubini theorem on double integration, and differentiation. Pr.: MATH 821. MATH-822-0-1701

MATH 825. Complex Analysis I. (3) I. Holomorphic functions, harmonic functions, the Cauchy integral theorem, normal families and the Riemann mapping theorem, and the Mittag-Leffler theorem. Pr.: MATH 822 or consent of department. MATH-825-0-1701

MATH 826. Complex Analysis II. (3) II. Analytic continuation, the Picard theorem. HP-spaces, elementary theory of Banach algebra, the theory of Fourier transforms, and the Paley-Wiener theorems. Pr.: MATH 825. MATH-826-0-1701

MATH 852. Functional Analysis I. (3) I, in alternate years. Topics to be selected from linear topological spaces, seminormed linear spaces, Banach spaces, Hilbert spaces, Banach algebras, spectral theory, harmonic analysis, and others. May be taken four times for a total of 12 hours credit. Pr.: MATH 822. MATH-852-0-1701

MATH 853. Functional Analysis II. (3) II, in alternate years. Continuation of Functional Analysis I. May be repeated for credit. Pr.: MATH 852. MATH-853-0-1701

MATH 855. Methods of Applied Mathematics I. (3) An introduction to the mathematical techniques of problem solving in the sciences and engineering. Construction of mathematical models; problem formulation, dimensional analysis and scaling; solution methods for differential equations and difference equations; methods for obtaining approximate solutions; regular and singular perturbation methods, asymptotic series, applications to specific equations and scientific problems. Pr.: MATH 630, MATH 633, and MATH 551. MATH-855-0-0701

MATH 856. Methods of Applied Mathematics II. (3) A continuation of MATH 855. Asymptotic expansion of integrals; the methods of stationary phase and steepest descent; summation of series, the Shanks transformation and Padé fractions; boundary layer theory; the WKB and Langer approximations; the method of averaging and the method of multiple scales. Pr.: MATH 855. MATH-856-0-1701

MATH 861. Numerical Analysis I. (3) I. Topics covered may include elementary functional analysis relevant to numerical analysis; numerical solution of differential or integral equations; analysis of stability and convergence; numerical linear algebra including large-scale systems; approximation theory. Pr.: MATH 634, 655. MATH-861-0-1701

MATH 862. Numerical Analysis II. (3) II. Continuation of MATH 861. Pr.: MATH 861. MATH-862-0-1701

MATH 866. Partial Differential Equations I. (3) I. Elliptic, parabolic, and hyperbolic partial differential equations of the second order. First order partial differential equations, characteristics. Linear and nonlinear hyperbolic systems, nonlinear elliptic equations. Pr.: MATH 634, 641. MATH-866-0-1701

MATH 867. Partial Differential Equations II. (3) II. Continuation of MATH 866. Pr.: MATH 866. MATH-867-0-1701

MATH 871. General Topology I. (3) I. Topological spaces and topological invariants; continuous mappings and their invariants perfect mappings; topological constructs (product, quotient, direct and inverse limit spaces). Pr.: MATH 702. MATH-871-0-1701

MATH 872. General Topology II. (3) II. Compact spaces and compactification, uniform and proximity spaces, metric spaces and metrization, topology of D^n , function spaces, complete spaces, introduction to homotopy theory. Pr.: MATH 871. MATH-872-0-1701

MATH 897. Seminar in Mathematics Education. (1-3) II, S. Topics in mathematics and the related applications in mathematics education. Pr.: Graduate standing and consent of instructor. MATH-897-2-0833

MATH 898. Topics in Mathematics. (Var.) I, II, S. Pr.: Background of courses needed for topic undertaken and consent of instructor. MATH-898-4-1701

MATH 899. Thesis Topics. (Var.) I, II, S. MATH-899-4-1701

MATH 910. Universal Algebra I. (3) I. Topics include congruences, homomorphisms and isomorphisms, direct and subdirect products, varieties, Birkhoff's theorem, and the Mal'cev conditions. In addition special topics will be selected from Stone duality, ultraproducts, Boolean products, and connections with model theory. Pr.: MATH 811. MATH-910-0-1701

MATH 911. Universal Algebra II. (3) II. Continuation of MATH 910. Pr.: MATH 910. MATH-911-0-1701

MATH 914. Lattice Theory I. (3) I, in alternate years. Posets, quantum logics, orthocomplemented, orthomodular, and Boolean lattices; the concepts of atomicity, completeness, reducibility, modularity, M-symmetry, O-symmetry, distributivity, algebraic coordinization, and specific realizations. Pr.: Consent of instructor. MATH-914-0-1701

MATH 915. Lattice Theory II. (3) II, in alternate years. Continuation of MATH 914. Pr.: MATH 914. MATH-915-0-1701

MATH 920. Theory of Groups. (3) I. Group representations and group characters, transfer, signalizer functors, theory of pushing-up, groups of Lie type, (B,N)-pairs, chamber systems and buildings, sporadic simple groups, amalgam methods, Bass-Serre theory. Pr.: MATH 811. MATH-920-0-1701

MATH 925. Group Representations and Character Theory I. (3) I. The basic topics in representation theory are covered: Schur's Lemma, irreducibility, class functions, characters, orthogonality relations, Frobenius-Schur theorem, induced characters and Frobenius reciprocity, Mackey's theorem, Clifford's theorem, exceptional characters and applications to group orders, generalized characters and Brauer's characterization of characters. Pr.: MATH 811. MATH-925-0-1701

MATH 926. Group Representations and Character Theory II. (3) II. Depending on the interests of the students, topics may be chosen from the following: modular representations, Brauer's theory of blocks, characters of the linear groups, homologically induced representations, representations of the complex Lie algebras. Pr.: MATH 925. MATH-926-0-1701

MATH 971. Algebraic Topology I. (3) I. Homotopy groups, covering spaces, fibrations, homology, general cohomology theory and duality, homotopy theory. Pr.: MATH 811 and 872. MATH-971-0-1701

MATH 972. Algebraic Topology II. (3) II. Continuation of Algebraic Topology I. Pr.: MATH 971. MATH-972-0-1701

MATH 991. Topics in Algebra. (3) On sufficient demand. Selected topics in modern algebra. May be taken more than once for credit. Pr.: Consent of instructor. MATH-991-0-1701

MATH 992. Topics in Analysis. (3) On sufficient demand. Selected topics in modern analysis. May be taken more than once for credit. Pr.: Consent of instructor. MATH-992-0-1701

MATH 993. Topics in Harmonic Analysis. (3) On sufficient demand. Selected topics in harmonic analysis. May be taken more than once for credit. Pr.: Consent of instructor. MATH-993-0-1701

MATH 994. Topics in Applied Mathematics. (3) On sufficient demand. Selected topics in applied mathematics. May be taken more than once for credit. Pr.: Consent of instructor. MATH-994-0-1701

MATH 995. Topics in Geometry. (3) On sufficient demand. Selected topics in geometry, such as convex sets of distance geometry. May be taken more than once for credit. Pr.: Consent of instructor. MATH-995-0-1701

MATH 996. Topics in Topology. (3) On sufficient demand. Selected topics in topology, such as homotopy, topological groups, topological dynamics, or algebraic topology. May be taken more than once for credit. Pr.: Consent of instructor. MATH-996-0-1701

MATH 997. Topics in Number Theory. (3) I, II. On sufficient demand. Selected topics in number theory. May be taken more than once for credit. Pr.: MATH 706 or consent of instructor. MATH-997-0-1702

MATH 999. Research in Mathematics. (Var.) I, II, S. Pr.: Sufficient training to carry on the line of research undertaken and consent of instructor. MATH-999-4-1701

Military Science

Lieutenant Colonel William J. Cook III,
Head

Executive Officer Major Pepperd; Assistant Professors Major Booker, Captain Clark, Captain Bucher; Instructors Master Sergeant Rayburn and Sergeant First Class Marvin; Supply Technician Kim Jones; Cadet Records Clerk Janet Sain; Secretary Tina Signorello.

The Army Reserve Officers' Training Corps (Army ROTC) program emphasizes the leadership and management skills required for success in military or civilian careers. Students find that the student-faculty interaction improves self-confidence and overall academic performance. Army ROTC prepares students to serve as officers in the Army, Army National Guard, and Army Reserve.

The courses are open to all University students. Students, both undergraduate and graduate, with two years remaining at Kansas State University are eligible to pursue an officer's commission through Army ROTC. Military science courses are credit-awarding courses and fulfill elective credit requirements in any degree program. Cadets may pursue any curriculum offered by the University.

The military science curriculum consists of the basic course, normally completed during the freshman and sophomore years, and the advanced course, oriented toward the junior and senior years. Texts and other materials required in ROTC courses are provided without cost.

Basic course

The basic course consists of a series of four 2-hour courses open to all University students that may be counted as electives. Enrollment in basic course classes does not obligate a student to military service. Freshmen will normally enroll in MSCI 104 and 105. Sophomores will normally enroll in MSCI 204 and 205.

Advanced course

The Army ROTC advanced course is structured to develop the leadership potential of students choosing to pursue an officer's commission. Prerequisites for the advanced course may be satisfied in a number of ways; specific questions on

individual eligibility should be addressed to the department staff.

Students accepted into the advanced course agree to complete the curriculum and to accept an Active Army, Army Reserve, or Army National Guard commission, if offered. Each advanced course cadet receives a \$100 per month allowance during the school year in return for this agreement. A six-week advanced summer camp, with pay, is an integral part of the advanced course and normally is completed between the junior and senior years. Airborne, Air Assault, Ranger, and the Northern Warfare training courses are U.S. Army schools available to qualified volunteers in addition to other training opportunities.

Basic camp

A six-week ROTC basic summer camp, with pay, is available. This allows ROTC participation by students who have not taken basic course classes. Application should be made to the Department of Military Science early in the spring semester. Students will attend ROTC Basic Camp during the summer. Satisfactory completion of the ROTC Basic Camp earns 4 hours academic credit and satisfies all prerequisites for entry into the advanced course. Attendance at the summer camp does not incur any military obligation.

Discharge of duty

Federal laws provide that ROTC graduates may discharge their military obligation in one of two ways: (1) two to four years on active duty with the remainder of the statutory eight-year obligation completed with the Army Reserve or National Guard organizations; or (2) three to six months active duty for training with the remainder of an eight-year obligation completed with Army Reserve or National Guard organizations. Preferences indicated by the graduate for a particular form of service are normally respected. Members of Army National Guard and Army Reserve units may enter the Simultaneous Membership Program (SMP). This program allows cadets to serve with a National Guard or Army Reserve unit while in Army ROTC, receiving both financial assistance and valuable experience.

Scholarships

The Army provides two-, three-, or four-year scholarships to selected high school and college students. These scholarships provide full tuition and fees, an allowance for books and supplies, and \$100 per school month. The scholarships are available on a competitive basis to all students, regardless of present enrollment in Army ROTC, who wish to receive commissions as officers.

They must have two years remaining towards undergraduate or graduate programs. These scholarships, applied for during the spring semester, become

effective the following fall. In addition to the Army ROTC scholarships, the Kansas Army National Guard offers one-, two-, three-, or four-year scholarships to selected high school and college students. The Kansas Army National Guard Scholarship is for Kansas residents and pays in-state tuition only.

Voluntary organizations

The department sponsors three voluntary organizations, a student chapter of the Association of the United States Army (AUSA), the KSU Rifle Club, and the ROTC Ranger Company. The AUSA chapter engages in professional and community service activities including United Way campaign support, field trips, and food drives. The Rifle Club participates in intercollegiate rifle matches. The ROTC Ranger Company provides additional tactical training and leadership experience. It supplements ROTC classroom instruction and field training to better prepare cadets for Advanced Camp and to be Army officers.

Students desiring additional information on these organizations are invited to contact the department. Students need not be enrolled in Army ROTC to participate in these organizations.

Recommended courses

In recognition of leadership's many facets, the department requires that students enrolled in ROTC select from a number of University courses which complement the leadership program. One course each in written communication skills, human behavior, military history, computer literacy, and math are required. Students receiving Army ROTC scholarships are required to take one semester of an Indo-European or Asiatic language. In addition to the required courses, one course each in national security policy and management is recommended. The majority of these courses may be applied as elective classes for the student's degree requirements. A list of acceptable courses is available at the Department of Military Science.

Basic course

Undergraduate credit

MSCI 100. Mountaineering and Introduction to Military Science. (1) I, II. Basic mountaineering and introduction to Army ROTC. MSCI-100-0-1801

MSCI 102. Basic Riflery and Introduction to Military Science. (1) I, II. Basic riflery and three-position match shooting, including a brief introduction to the Army ROTC program. MSCI-102-0-1801

MSCI 103. Orienteering and Introduction to Military Science. (1) I, II. Introduction to orienteering and land navigation. One hour rec. a week. Also includes a brief introduction to the Army ROTC program. MSCI-103-0-1801

MSCI 104. Military Science 1A—Basic Military Concepts. (2) I. Rifle marksmanship, introduction of basic military concepts and the ROTC program, and a weekly leadership lab. MSCI-104-0-1801

MSCI 105. Military Science 1B—Introduction to Military Leadership. (2) II. Introduction to military leadership using various leadership theories and skills, and a weekly leadership lab. MSCI-105-0-1801

MSCI 106. Basic Military Skills. (1) I, II. Students will be exposed to a variety of skills practiced in the military to include: tactics, effective communications, map reading, weapons employment, and survival. MSCI-106-0-1801

MSCI 201. Leadership Guidance. (1) I, II. Leadership theory, the leader, the group, needs, and motivation. Study of both military and business leadership styles. MSCI-201-0-1801

MSCI 202. Map Reading. (1) I, II. Military geography, map reading, and land navigation. MSCI-202-0-1801

MSCI 203. Care of Combat Casualties. (1) I, II. Care and treatment of wounds and injuries normally associated with the modern battlefield; includes casualty evaluation, treatment, and medical prevention programs. MSCI-203-1-1801

MSCI 204. Military Science 2A—The U.S. Army: An Overview. (2) I. An introduction to the role of the U.S. Army, Army Reserve, and National Guard. Includes material covered in MSCI 203 and the customs and traditions of the service, the Army rank structure, branches of the Army, and military life. It includes leadership labs to introduce the student to Army drill and ceremonies, and physical fitness requirements. Credit may not be received for both MSCI 203 and 204. MSCI-204-0-1801

MSCI 205. Military Science 2B—Leadership and Military Skills. (2) II. Military geography, map reading, and land navigation. Concepts of military leadership to include conducting military inspections, and a weekly leadership lab. Credit may not be received for both MSCI 202 and 205. MSCI-205-0-1801

MSCI 250. Military Science 2C. (4) S. A six-week basic course summer camp taught off campus at Fort Knox, Kentucky. Camp content includes lectures, demonstrations, practical exercises in leadership, and other military-related skills. Pr.: Two years remaining on campus after completion of camp, meeting the physical standards, and permission of the professor of military science. MSCI-250-0-1801

Advanced course

Undergraduate credit

MSCI 300. Military Science 3A—Leadership and Small Unit Tactics I. (3) I. Small unit tactics, advanced leadership and management, methods of instruction, time management, and a weekly leadership lab. Pr.: Completion of basic course or acceptable equiv. MSCI-300-0-1801

MSCI 302. Military Science 3B—Leadership and Small Unit Tactics II. (3) II. Military communications, advanced leadership and management, small unit tactics, preparation for summer camp, and a weekly leadership lab. Pr.: Completion of basic course or acceptable equiv. MSCI-302-0-1801

MSCI 400. Military Science 4A—Military Management I. (3) I. Administrative and staff operations and procedures, logistics, and a weekly leadership lab. Pr.: Completion of MSCI 300 and 302. MSCI-400-0-1801

MSCI 402. Military Science 4B—Military Management II. (3) II. Administrative and staff operations and procedures, military law, career planning, ethics, and a weekly leadership lab. Pr.: Completion of MSCI 300 and 302. MSCI-402-0-1801

Modern Languages

Bradley Shaw,* Head

Professor S. Dehon,* Ossar,* Associate Professors Alexander,* Beeson,* Benson,* Corum,* Kolonosky,* McGraw,* Shaw,* and Tunstall;* Assistant Professors Garavito,* Gottlieb,* Ihrle,* Mendenhall,* and Miller;* Instructor Driss.

Undergraduate study

All regular courses offered by the Department of Modern Languages may be taken by nonmajors on an A/Pass/F basis, subject to the provisions of the University policy. Language laboratories are offered only on a Credit/No-Credit basis.

Students majoring in languages should enroll for the bachelor of arts degree.

Within the modern language major, French, German, and Spanish are offered; in highly unusual cases, a major in classics or Russian may be arranged.

For a language major, 30 hours in a single language above the level of I and II must be completed. Students majoring in languages must take two survey courses in the chosen language. In French or German, the student must also take three literature courses at the 700 level. In Spanish the student must take at least one course from three of the following four groups: 751, 752, 755; 761, 764, 775; 756, 757, 763; 760, 771, 772. A minimum 2.0 GPA in courses taken as part of the major is required for graduation.

The attention of the student preparing for graduate school or for high school teaching is directed to the corollary course in linguistics, LG 600. Six hours of history of the country of the student's major language interest are desirable.

Entering students who have had previous language experience and who plan to continue language study are required to take a language placement examination before or at the beginning of the first semester of language study. If there is any doubt as to proper placement, the head of the Department of Modern Languages should be consulted.

Students wishing to acquire retroactive credit for language proficiency gained before coming to KSU should consult with the head of the Department of Modern Languages.

Graduate study

The M.A. degree is offered in the fields of French, German, and Spanish. General requirements for the master of arts degree can be found in the Graduate School section of this catalog.

Detailed information concerning the graduate program in modern languages and financial support available may be obtained by writing to the head of the department.

The department cooperates with several others in the South Asia language and area studies program, details of which are given in the Secondary Majors and Graduate School sections of this catalog.

The Department of Modern Languages co-sponsors a national literary journal, *Studies in Twentieth Century Literature*.

Programs abroad

The department sponsors summer study programs in Jalapa, Mexico, and cooperates with German exchange programs in Germany, Austria, and Switzerland. All inquiries should be addressed to the head of the department.

Honors program

Undergraduate credit

MLANG 297. Honors Introduction to the Humanities I. (3) I. Study of selected major works of history, literature, and philosophy which have been of central importance in the Western cultural tradition. Considerable emphasis is placed on classroom discussion and writing interpretive essays. Limited to entering freshman students. Pr.: Consent of instructor. Same as ENGL 297, HIST 297, PHIL 297. MLANG-297-0-1101

MLANG 298. Honors Introduction to the Humanities II. (3) II. Continuation of MLANG 297. Pr.: MLANG 297 or consent of instructor. Same as ENGL 298, HIST 298, PHIL 298. MLANG-298-0-1101

MLANG 399. Honors Seminar in Modern Languages. (1-3) I, II. Reading and discussion of selected masterpieces of European literature in English translation. Open to non-language majors in the honors program. MLANG-399-0-1101

MLANG 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. MLANG-499-4-1101

Courses in modern languages

Undergraduate and graduate credit in minor field

FREN 502. French Literature in Translation. (3) Selected readings in English from the works of such major French authors as Flaubert, Zola, Sartre, Camus, and Ionesco. Not accepted for major credit in French. FREN-502-0-1102

GRMN 503. German Literature in Translation. (3) Selected readings in English from such major German authors as Mann, Brecht, Hesse, Grass, and Kafka. Not accepted for major credit in German. GRMN-503-0-1103

LATIN 501. Classical Literature in Translation. (3) Selected readings in English from the works of such major classical authors as Homer, Euripides, Vergil, Horace, and Terence. LATIN-501-0-1110

MLANG 507. European Literature in Translation. (3) Selected readings in English from the major authors of Europe and the Spanish-speaking world. MLANG-507-0-1505

RUSSN 504. Russian Literature in Translation: The Nineteenth Century. (3) Survey of the principal writers of tsarist Russia with emphasis upon Turgenev, Dostoevsky, Tolstoy, and Chekhov. RUSSN-504-0-1106

RUSSN 508. Russian Literature in Translation: The Soviet Period. (3) The development of Russian literature since the Revolution, with emphasis upon Mayakovsky, Sholokov, Pasternak, and Solzhenitsyn. RUSSN-508-0-1106

SPAN 505. Spanish Literature in Translation. (3) Selected readings in English from the works of such major Spanish and Latin American authors as Garcia Lorca, Borges, Neruda, and Garcia Marquez. Not accepted for major credit in Spanish. SPAN-505-0-1105

Graduate credit

MLANG 800. Colloquium in Modern Languages. (2) I. A graduate colloquium for M.A. candidates in French, German, and Spanish. Variable topics in literary and cultural fields appropriate to study in common by students in these languages. Pr.: Graduate standing. MLANG-800-0-1101

Arabic

Undergraduate credit

ARAB 181. Arabic I. (4) Introduction to the structure of modern Arabic. Essentials of grammar, speaking, reading, and writing. ARAB-181-0-1107

ARAB 182. Arabic II. (4) Continuation of Arabic I. Pr.: ARAB 181 or equiv. ARAB-182-0-1107

ARAB 281. Arabic III. (4) Further development of language skills. Pr.: ARAB 182 or equiv. ARAB-281-0-1107

ARAB 282. Arabic IV. (3) Continuation of Arabic III. Pr.: ARAB 281 or equiv. ARAB-282-0-1107

Undergraduate and graduate credit in minor field

ARAB 540. Special Studies in Arabic. (Var.) Pr.: Consent of the department head and instructor involved. ARAB-540-0-1107

French

FREN 001. Orientation for Summer School Program in Paris. (0) FREN-001-0-1102

Undergraduate credit

FREN 109. French I. Language laboratory. Strongly recommended for students taking French I. Conc. enrollment in French I required. For Credit/No Credit only. FREN-109-0-1102

FREN 110. French II. (1) Language laboratory. Strongly recommended for students taking French II. Conc. enrollment in French II required. For Credit/No Credit only. FREN-110-0-1102

FREN 111. French I. (4) Introduction to the structure of modern French, emphasizing the spoken language with practice in the language laboratory. FREN-111-0-1102

FREN 112. French II. (4) Continuation of French I, completion of basic presentation of the structure of French. Emphasis on spoken language, use of language lab. Pr.: FREN 111 or equiv. FREN-112-0-1102

FREN 211. French III. (4) Intensive review of the structure of the French language. Reading and discussion of French prose. Pr.: FREN 112 or equiv. FREN-211-0-1102

FREN 212. Elementary French Conversation IIIA. (2) Course not open to fluent speakers of French. Normally to be taken conc. with French III. Pr.: FREN 112 or equiv. FREN-212-0-1102

FREN 213. French IV. (3) Reading and discussion of modern French prose and review of the more difficult points of French grammar. Pr.: FREN 211 or equiv. FREN-213-0-1102

FREN 214. French Conversation IVA. (2) Continued practice in conversational French. Not open to fluent speakers of French. Normally to be taken conc. with French IV. Pr.: FREN 211 or equiv. FREN-214-0-1102

FREN 502. French Literature in Translation. (3) Selected readings in English from the works of such major French authors as Flaubert, Zola, Sartre, Camus, and Ionesco. Not accepted for major credit in French. FREN-502-0-1102

FREN 510. Modern French Culture. (2) French culture since World War II with special emphasis on social, economic, historical, and artistic developments of that period. Taught in English. Not accepted for major credit in French. FREN-510-0-1102

Undergraduate and graduate credit in minor field

FREN 511. Masterpieces of French Literature I. (3) The reading and discussion of major works of French literature from the Middle Ages to the end of the eighteenth century. Pr.: FREN 213 or equiv. FREN-511-0-1102

FREN 512. Masterpieces of French Literature II. (3) The reading and discussion of major works of French literature from the early nineteenth century to the present. Pr.: FREN 213 or equiv. FREN-512-0-1102

FREN 513. French Composition and Conversation. (3) Review in depth of the structure of the language. Intensive practice in written and conversational French. Pr.: FREN 213 or equiv. FREN-513-0-1102

FREN 514. French Civilization. (3) Introduction to French culture with special emphasis on social and historical developments since World War II. Pr.: 18 hours of college French or equiv. FREN-514-0-1102

FREN 516. Readings in French. (3) Practice in reading a variety of literary, journalistic, and specialized texts. Pr.: FREN 213 or equiv. FREN-516-0-1102

FREN 517. Commercial French. (3) Advanced grammar necessary for adequate oral and written expression in international business and diplomatic situations, including specialized terminology, conversation and discussion, and translation. Pr.: FREN 213. FREN-517-0-1102

FREN 518. Advanced French Conversation. (2) II. Practice in spoken French, with emphasis on idiomatic expression. Course not open to students whose primary language is French and whose competence has been demonstrated in the language at this level. May be repeated once for credit. Pr.: FREN 513. FREN-518-0-1102

FREN 519. Special Studies in French. (Var.) Pr.: Consent of department head and instructor involved. FREN-519-3-1102

Undergraduate and graduate credit

FREN 709. Medieval French Literature. (3) An introduction to literary forms, style, and thought from the eleventh century to the fifteenth century in France. Readings in modern French include *Chanson de Roland*, Chretien de Troyes, *Roman de la Rose*, etc. Pr.: 21 hours of college French or equiv. FREN-709-0-1102

FREN 710. Sixteenth-Century French Literature. (3) Reading and discussion of selected prose and poetry of the French Renaissance. Pr.: 21 hours of college French or equiv. FREN-710-0-1102

FREN 711. Seventeenth-Century French Literature I. (3) I. Various literary forms of the French baroque period. Reading of representative texts by Corneille, Pascal, Descartes, and others. Pr.: 21 hours of college French or equiv. FREN-711-0-1102

FREN 712. Seventeenth-Century French Literature II. (3) II. Various literary forms of the French classical period. Reading of representative texts by Moliere, Racine, Lafayette, La Fontaine, and others. Pr.: 21 hours of college French or equiv. FREN-712-0-1102

FREN 713. Eighteenth-Century French Literature. (3) Critical study of the literature of the Enlightenment. Pr.: 21 hours of college French or equiv. FREN-713-0-1102

FREN 714. Nineteenth-Century French Literature I. (3) A study of preromanticism and romanticism. Pr.: 21 hours of college French or equiv. FREN-714-0-1102

FREN 715. Nineteenth-Century French Literature II. (3) A study of realism, naturalism, and symbolism. Pr.: 21 hours of college French or equiv. FREN-715-0-1102

FREN 716. Twentieth-Century French Literature I. (3) The study of major themes and trends in the novel, drama, and poetry as reflected in representative works of such authors as Proust, Mauriac, Cocteau, Claudel, Valery, and others. Pr.: 21 hours of college French or equiv. FREN-716-0-1102

FREN 717. Twentieth-Century French Literature II. (3) Reading and analysis of recent innovations in literary theory and practice as found in the works of such authors as Sartre, Camus, Beckett, Ionesco, Robbe-Grillet, Sarraute, and others. Pr.: 21 hours of college French or equiv. FREN-717-0-1102

FREN 718. The French Novel. (3) The development of the novel from the seventeenth century to the present, seen through selected masterworks. Pr.: 21 hours of college French. FREN-718-0-1102

FREN 719. Advanced Spoken and Written French. (3) II. An advanced, intensive study of French prose style. Introduction to the techniques of translation from English to French. Intensive practice in oral style and diction. Pr.: 21 hours of college French. FREN-719-0-1102

FREN 720. Seminar in French. (3) A seminar with variable topics. Pr.: Senior standing or consent of the instructor. FREN-720-0-1102

FREN 799. Problems in Modern Languages. (Var.) FREN-799-3-1101

Graduate credit

FREN 899. Research in Modern Languages. (Var.) Pr.: 30 hours in one modern language or equiv. FREN-899-4-1101

German

GRMN 002. Orientation for Summer School Program in Germany. (0) GRMN-002-0-1103

Undergraduate credit

GRMN 119. German I. (1) Language laboratory. Strongly recommended for students taking German I. Conc. enrollment in German I required. For Credit/No Credit only. GRMN-119-0-1103

GRMN 120. German II. (1) Language laboratory. Strongly recommended for students taking German II. Conc. enrollment in German II required. For Credit/No Credit only. GRMN-120-0-1103

GRMN 121. German I. (4) Introduction to the structure of modern German. Practice of the spoken language with additional experience in the language lab. GRMN-121-0-1103

GRMN 122. German II. (4) Continuation and conclusion of the introduction to modern German, reading of selected prose texts. Pr.: GRMN 121 or equiv. GRMN-122-0-1103

GRMN 221. German III. (4) Reading and discussion of a selection of modern German prose and review of the structure of German. Pr.: GRMN 122 or equiv. GRMN-221-0-1103

GRMN 222. Elementary German Conversation IIIA. (2) Practice in beginning conversational German. Course not open to fluent speakers of German. Course normally taken conc. with German III. Pr.: GRMN 122 or equiv. GRMN-222-0-1103

GRMN 223. German IV. (3) Reading and discussion of modern German prose and review of the more difficult points of German grammar. Pr.: GRMN 221 or equiv. GRMN-223-0-1103

GRMN 224. German Conversation IVA. (2) Continued practice in conversational German. Course not open to fluent speakers of German. Normally taken conc. with German IV. Pr.: GRMN 221 or equiv. GRMN-224-0-1103

GRMN 503. German Literature in Translation. (3) Selected readings in English from such major German authors as Mann, Brecht, Hesse, Grass, and Kafka. Not accepted for major credit in German. GRMN-503-0-1103

Undergraduate and graduate credit in minor field

GRMN 521. Introduction to German Literature I. (3) Literary movements of the nineteenth century are introduced through the reading and discussion of texts in various forms and by representative authors. Pr.: GRMN 223 or equiv. GRMN-521-0-1103

GRMN 522. Introduction to German Literature II. (3) Discussion of significant works of twentieth-century prose, poetry, and drama. Special emphasis is placed on the literature of recent decades. Pr.: GRMN 223 or equiv. GRMN-522-0-1103

GRMN 523. German Composition. (3) A study of German syntax and exercises in composition. Pr.: GRMN 223 or equiv. GRMN-523-0-1103

GRMN 524. German for Reading Knowledge I. (3) The grammar and syntax of German and the reading of basic material selected from modern German texts. Not for fulfillment of humanities distribution requirement. GRMN-524-0-1103

GRMN 525. German for Reading Knowledge II. (3) Continued reading of material from modern German texts. Not for fulfillment of humanities distribution requirement. Pr.: GRMN 524 or equiv. GRMN-525-0-1103

GRMN 526. Business German. (3) Advanced grammar necessary for adequate oral and written expression in international business and diplomatic situations, including specialized terminology, conversation and discussion, and translation. Pr.: GRMN 523. GRMN-526-0-1103

GRMN 527. Advanced German Conversation. (3) Intensive practice in conversation. Course not open to students whose primary language is German and whose competence has been demonstrated in the language at this level. Pr.: GRMN 223 or equiv. GRMN-527-0-1103

GRMN 529. Special Studies in German. (Var.) Pr.: Consent of department head and instructor involved. GRMN-529-3-1103

GRMN 530. German Civilization. (3) II. The political and cultural development of the German-speaking people and their role and influence in the history of the Western world. Pr.: 18 hours of college German. GRMN-530-0-1103

Undergraduate and graduate credit

GRMN 721. German Classicism. (3) I. Reading and discussion of late eighteenth-century texts, including works by Goethe, Schiller, Hoelderlin, etc. Pr.: 21 hours of college German or equiv. GRMN-721-0-1103

GRMN 722. German Romanticism. (3) II. A study of representative works of German romantic literature by such authors as Schlegel, Tieck, Eichendorff, Novalis. Pr.: 21 hours of college German or equiv. GRMN-722-0-1103

GRMN 723. Goethe and Faust. (3) I. The writings of Goethe and his masterpiece, *Faust*. Pr.: 21 hours of college German or equiv. GRMN-723-0-1103

GRMN 724. German Prose and Drama of the Nineteenth Century. (3) II. A consideration of post-romantic German literature with special emphasis on the novella. Authors including Grillparzer, Keller, and Meyer are discussed. Pr.: 21 hours of college German. GRMN-724-0-1103

GRMN 725. Early Twentieth-Century German Literature. (3) II. A study of the drama and lyric of naturalism, neoclassicism, neo-romanticism, and expressionism. Pr.: 21 hours of college German. GRMN-725-0-1103

GRMN 726. German Literature since 1945. (3) I. A discussion of the postwar writings of the Gruppe 47, Swiss playwrights, and others. Pr.: 21 hours of college German. GRMN-726-0-1103

GRMN 727. The Modern German Novel. (3) II. Theory of the German novel with examples from authors such as Mann, Hesse, Grass, and others. Pr.: 21 hours of college German. GRMN-727-0-1103

GRMN 728. History of the German Language. (3) I. A study of the development of the sounds, forms, and syntax of standard German. Fulfills distribution requirements for major. Pr.: Senior standing. GRMN-728-0-1103

GRMN 729. Seminar in German. (3) A seminar with variable topics, including literature of social and political protest, Austrian and Swiss literature, literature of the Middle Ages, emigre literature, etc. Pr.: Senior standing or consent of instructor. GRMN-729-0-1103

GRMN 731. Advanced Spoken and Written German. (3) Intensive practice in conversation and diction, with considerable practice in the writing of essays in German. Pr.: 24 hours of college German. GRMN-731-0-1103

GRMN 732. Methods in German Literary Criticism. (3) Introduction to the various theories of literary analysis. Interpretation of representative German texts. Pr.: 24 hours of college German. GRMN-732-0-1103

GRMN 733. The Enlightenment and Storm and Stress. (3) A study of representative texts from various movements in German literature and culture of the eighteenth century, including *Empfindsamkeit* and *Rococo*. Such authors as Gottsched, Klopstock, Lessing, Lichtenberg, Wieland, and the young Goethe and Schiller will be discussed. Pr.: 21 hours of college German. GRMN-733-0-1103

GRMN 734. Literature of the German Democratic Republic. (3) A study of the literary developments within the German Democratic Republic. The course will consider the writers' role in a socialist society and their impact upon the cultural scene. Readings will include representative works from all genres. Pr.: 21 hours of college German. GRMN-734-0-1103

GRMN 740. German Literature in Second-Language Learning. (3) Analysis of literary texts from German-speaking countries within their cultural context. The development of interpretive skills and application to the German curriculum will be emphasized. Pr.: 24 credits of 200 or above in German or equiv. GRMN-740-0-1103

GRMN 741. German Culture in Second-Language Learning. (3) Emphasis on the study of German culture and application to German curriculum including the development of materials. Pr.: 24 credits of 200 and above in German or equiv. Same as EDCI 772. GRMN-741-0-1103

GRMN 799. Problems in Modern Languages. (Var.) GRMN-799-3-1101

Graduate credit

GRMN 899. Research in Modern Languages. (Var.) Pr.: 30 hours in one modern language or equiv. GRMN-899-4-1101

Italian

Undergraduate credit

ITAL 129. Italian IL. (1) Language laboratory. Strongly recommended for students taking Italian I. Conc. enrollment in Italian I required. For Credit/No Credit only. ITAL-129-0-1104

ITAL 130. Italian IIL. (1) Language laboratory. Strongly recommended for students taking Italian II. Conc. enrollment in Italian II required. For Credit/No Credit only. ITAL-130-0-1104

ITAL 131. Italian I. (4) Introduction to the structure of modern Italian. ITAL-131-0-1104

ITAL 132. Italian II. (4) Continuation and completion of the study of modern Italian grammar, using the facilities of the language laboratory for audiolingual practice. Pr.: ITAL 131 or equiv. ITAL-132-0-1104

ITAL 231. Italian III. (4) Grammar review and reading selections from Italian literature. Pr.: ITAL 132 or equiv. ITAL-231-0-1104

ITAL 232. Italian IV. (3) Selective review of grammar and reading of examples of modern Italian literature. Pr.: ITAL 231 or equiv. ITAL-232-0-1104

ITAL 520. Special Studies in Italian. (Var.) Pr.: Consent of department head and instructor involved. ITAL-520-0-1104

Latin

Undergraduate credit

LATIN 105. Latin and Greek for Scientists. (1) II. The course is designed specifically to provide students of the biological sciences with a background in Latin and Greek roots of scientific terms. Emphasis on prefixes, suffixes, and word derivations. No prior knowledge of either Latin or Greek is required. Course may not be applied toward the fulfillment of either language or humanities requirements for any degree. LATIN-105-0-1109

LATIN 141. Latin I. (4) An introductory study of the structure of Latin. LATIN-141-0-1109

LATIN 142. Latin II. (4) Continuation and completion of the study of the structure of Latin. Pr.: LATIN 141. LATIN-142-0-1109

LATIN 241. Latin III. (4) Review of Latin grammar and reading of an anthology of Roman prose and poetry. Pr.: LATIN 142. LATIN-241-0-1109

LATIN 242. Latin IV. (3) Continuation of the study of Latin syntax and grammar, based upon the reading of Roman prose and poetry. Pr.: LATIN 241. LATIN-242-0-1109

LATIN 501. Classical Literature in Translation. (3) Selected readings in English from the works of such major classical authors as Homer, Euripides, Vergil, Horace, and Terence. LATIN-501-0-1110

Undergraduate and graduate credit in minor field

LATIN 549. Special Studies in Latin. (Var.) Pr.: Consent of the department head and instructor involved. LATIN-549-3-1109

Linguistics

Undergraduate and graduate credit in minor field

LG 730. Foundations of Semiotics. (3) II. The general theory of signs; detailed classification of signs and examination of several semiotic systems such as language, literature, culture, and society. The semiotics of communication and signification. Pr.: Senior standing. LG-730-0-1505

Undergraduate and graduate credit

LG 600. Principles of Linguistics. (3) Same as LING 600 and ENGL 600. LG-600-0-1505

LG 601. General Phonetics. (3) Same as LING 601 and ENGL 601. LG-601-1-1505

LG 602. Historical Linguistics. (3) Same as LING 602 and ENGL 602. LG-602-0-1505

LG 603. Topics in Linguistics. (3) Same as LING 603 and ENGL 603. LG-603-0-1505

LG 783. Phonology I. (3) Same as LING 783 and ENGL 783. LG-783-0-1505

LG 785. Syntax I. (3) Same as LING 785 and ENGL 785. LG-785-0-1505

LG 792. Field Methods in Linguistics. (3) Same as LING 792. LG-792-0-1505

Portuguese**Undergraduate credit**

PORT 163. Portuguese I. (4) I. Introduction to the structure of the Portuguese language, stressing Brazilian usage, and emphasizing oral and written skills. PORT-163-0-1199

PORT 164. Portuguese II. (4) II. Continuation of Portuguese I, completion of the basic presentation of structural and linguistic principles of the Portuguese language. Pr.: PORT 163 or equiv. course. PORT-164-0-1199

PORT 266. Portuguese III. (4) I. Intensive review of syntax and a comprehensive structural review of modern Portuguese, stressing Brazilian usage, with emphasis on composition and conversation. Pr.: PORT 164 or equiv. PORT-266-0-1199

PORT 267. Portuguese IV. (3) II. Reading and discussion of selections from contemporary prose, emphasizing Brazilian writings, and review of grammatical structures as needed. Pr.: PORT 266 or equiv. PORT-267-0-1199

Undergraduate and graduate credit in minor field

PORT 572. Special Studies in Portuguese. (1-3) Pr.: 15 hours of Portuguese and consent of instructor. PORT-572-0-1199

Russian**Undergraduate credit**

RUSSN 149. Russian I. (1) Language laboratory. Strongly recommended for students taking Russian I. Conc. enrollment in Russian I required. For Credit/No Credit only. RUSSN-149-0-1106

RUSSN 150. Russian II. (1) Language laboratory. Strongly recommended for students taking Russian II. Conc. enrollment in Russian II required. For Credit/No Credit only. RUSSN-150-0-1106

RUSSN 151. Russian I. (4) I. Introduction to the structure of modern Russian. Emphasis on the sounds of Russian, the use of the Cyrillic alphabet, and oral drills with added practice in the language laboratory. RUSSN-151-0-1106

RUSSN 152. Russian II. (4) II. Continuation of the study of Russian grammar and oral communication. Pr.: RUSSN 151 or equiv. RUSSN-152-0-1106

RUSSN 250. Russian Culture and Civilization. (3) Russia's past and present in the light of principal ideologies with emphasis upon fine art, literature, music, religion, politics, and education. Equal time will be devoted to the Tsarist and Soviet periods. Knowledge of Russian is not required. Same as HIST 250. RUSSN-250-0-1307

RUSSN 251. Russian III. (4) I. Completion of the study of Russian grammar. Reading of selected prose on the intermediate level. Pr.: RUSSN 152 or equiv. RUSSN-251-0-1106

RUSSN 252. Russian IV. (3) II. Intensive review of Russian grammar. Exercises in reading selected modern Russian texts in the original. Pr.: RUSSN 251 or equiv. RUSSN-252-0-1106

RUSSN 504. Russian Literature in Translation: The Nineteenth Century. (3) Survey of principal writers of Tsarist Russia with emphasis upon Turgenev, Dostoevsky, Tolstoy, and Chekhov. RUSSN-504-0-1106

RUSSN 508. Russian Literature in Translation: The Soviet Period. (3) The development of Russian literature since the Revolution, with emphasis upon Mayakovsky, Sholokhov, Pasternak, and Solzhenitsyn. RUSSN-508-0-1106

Undergraduate and graduate credit in minor field

RUSSN 551. Russian V. (3) Reading of Russian short stories of the nineteenth and twentieth centuries, including works by Pushkin, Lermontov, Dostoevsky, and Chekhov. RUSSN-551-0-1106

RUSSN 552. Survey of Russian Literature. (3) A history of Russian literature from its beginnings until the present, with emphasis on the works of the nineteenth century, including those of Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, and Tolstoy. RUSSN-552-0-1106

RUSSN 553. Russian Conversation and Composition. (3) Discussion in Russian. Extensive practice in writing Russian compositions. RUSSN-553-0-1106

RUSSN 559. Special Studies in Russian. (Var.) Pr.: Consent of department head and instructor involved. RUSSN-559-3-1106

Spanish

SPAN 003. Orientation for Summer School Abroad Program in Jalapa, Mexico. (0) SPAN-003-0-1105

Undergraduate credit

SPAN 159. Spanish I. (1) Language laboratory. Strongly recommended for students taking Spanish I. Conc. enrollment in Spanish I required. For Credit/No Credit only. SPAN-159-0-1105

SPAN 160. Spanish II. (1) Language laboratory. Strongly recommended for students taking Spanish II. Conc. enrollment in Spanish II required. For Credit/No Credit only. SPAN-160-0-1105

SPAN 161. Spanish I. (4) Basic introduction to the structure of the Spanish language, emphasizing oral and written drills, as well as practice in the language laboratory. SPAN-161-0-1105

SPAN 162. Spanish II. (4) Continuation of Spanish I, completion of basic presentation of structural and linguistic principles of the Spanish language, and practice in the language laboratory. Pr.: SPAN 161 or equiv. SPAN-162-0-1105

SPAN 261. Spanish III. (4) An intensive review of syntax and a comprehensive structural review of Spanish, with emphasis on composition and conversation. Pr.: SPAN 162 or equiv. SPAN-261-0-1105

SPAN 262. Elementary Spanish Conversation IIIA. (2) Practice in beginning conversational Spanish. Emphasis on oral communication within the classroom. Course not open to fluent speakers. Should be taken conc. with Spanish III. SPAN-262-0-1105

SPAN 263. Spanish IV. (3) Reading and discussion of selections from contemporary prose, and review of grammatical structures as needed. Pr.: SPAN 261 or equiv. SPAN-263-0-1105

SPAN 264. Elementary Spanish Conversation IVA. (2) Continuation of Elementary Spanish Conversation IIIA. Should be taken conc. with Spanish IV. SPAN-264-0-1105

SPAN 505. Spanish Literature in Translation. (3) Selected readings in English from the works of such major Spanish and Latin American authors as Garcia Lorca, Borges, Neruda, and Garcia Marquez. Not accepted for major credit in Spanish. SPAN-505-0-1105

Undergraduate and graduate credit in minor field

SPAN 563. Introduction to the Literature of Spanish America. (3) Reading and analysis of representative works of Spanish-American literature from the colonial period to the present. Pr.: SPAN 263 or equiv. SPAN-563-0-1105

SPAN 564. Spanish Composition and Grammar. (3) I. The grammar and syntax of modern Spanish. Course not open to those students whose primary language is Spanish and whose competence has been demonstrated in the language at this level. Pr.: SPAN 263 or equiv. SPAN-564-0-1105

SPAN 565. Spanish Civilization. (3) I. Survey of Spanish culture and civilization from its beginnings to the present; emphasis on Spanish contributions over the centuries in the humanistic field. Pr.: SPAN 263 or equiv. SPAN-565-0-1105

SPAN 566. Hispanic-American Civilization. (3) II. Survey of Spanish-American culture and civilization from 1492 to the present. Pr.: SPAN 263 or equiv. SPAN-566-0-1105

SPAN 567. Introduction to the Literature of Spain. (3) Reading and analysis of representative works of Spanish literature from its beginnings to the present. Pr.: SPAN 263 or equiv. SPAN-567-0-1105

SPAN 569. Special Studies in Spanish. (Var.) Pr.: Consent of department head and instructor involved. SPAN-569-3-1105

SPAN 571. Advanced Spanish Conversation. (3) II. Intensive practice in conversation. Course not open to those students whose primary language is Spanish and whose competence has been demonstrated in the language at this level. Pr.: SPAN 263 or equiv. SPAN-571-0-1105

SPAN 573. Business Spanish. (3) Advanced grammar necessary for adequate oral and written expression in international business and diplomatic situations, including specialized terminology, conversation and discussion, and translation. Pr.: SPAN 564 or equiv. SPAN-573-0-1105

SPAN 574. Hispanic Readings. (3) Practice in reading a variety of literary, journalistic, and specialized texts. Pr.: SPAN 263 or equiv. SPAN-574-0-1105

Undergraduate and graduate credit

SPAN 751. Spanish-American Narrative to 1950. (3) Development of the narrative in Spanish America from the colonial period to the mid-twentieth century. Analysis and discussion of representative authors from various regions. Pr.: 21 hours of college Spanish or equiv. SPAN-751-0-1105

SPAN 752. Contemporary Spanish-American Narrative. (3) Analysis and discussion of the narrative since approximately 1950, including such outstanding writers as Borges, Cortazar, Fuentes, Garcia Marquez, and Vargas Llosa. Pr.: 21 hours of college Spanish or equiv. SPAN-752-0-1105

SPAN 755. Spanish-American Poetry and Drama. (3) Analysis and discussion of Spanish-American poetry and drama, with emphasis on twentieth-century theater. Readings of selected major poets and leading playwrights from various regions of Spanish America. Pr.: 21 hours of college Spanish or equiv. SPAN-755-0-1105

SPAN 756. Nineteenth-Century Spanish Literature. (3) The reading and study of nineteenth-century Spanish literature: drama, essay, novel, poetry, and short story. Such authors as Larra, Zorrilla, el Duque de Rivas, Espronceda, Tamayo y Baus, Echegaray, Becquer, and Perez Galdos will be discussed. Pr.: 21 hours of college Spanish or equiv. SPAN-756-0-1105

SPAN 757. Perez Galdos and the Generation of '98. (3) Reading and analysis of works by Perez Galdos and such members of the Generation of '98 as Unamuno, Benavente, and Machado, within the historical and cultural framework of the late nineteenth and early twentieth centuries. Pr.: 21 hours of college Spanish or equiv. SPAN-757-0-1105

SPAN 760. Advanced Spoken and Written Spanish. (3) Intensive review of grammatical structure and refinement of standard Spanish usage. Extensive practice in composition and conversation, and translations from English into Spanish. Pr.: 21 hours of college Spanish or equiv. SPAN-760-0-1105

SPAN 761. Medieval and Renaissance Literature. (3) Reading and interpretation of the principal literary works of Medieval and Renaissance Spain, from the *jarchas* and the *Poema de Mio Cid* to the *crónicas* and *La Celestina*, studied within the historical and cultural context of each. Pr.: 21 hours of college Spanish or equiv. SPAN-761-0-1105

SPAN 763. Twentieth-Century Spanish Literature. (3) The major writers and directions of twentieth-century literature in Spain. Analysis and discussion of the works of such representative authors as Unamuno, Jimenez, Guillen, Lorca, Cela, Buero Vallejo, and Delibes. Pr.: 21 hours of college Spanish. SPAN-763-0-1105

SPAN 764. Spanish Literature of the Golden Age. (3) Reading and analysis of the works of such major writers as Lope de Vega, Tirso de Molina, Calderon de la Barca, Garcilaso, Fray Luis de Leon, San Juan de la Cruz, Gongora, and Quevedo, as well as selected works from the picaresque tradition. Pr.: 21 hours of college Spanish or equiv. SPAN-764-0-1105

SPAN 771. Introduction to Spanish Translation. (3) Translation theory and practice as applied to Spanish. Translations from Spanish to English and English to Spanish, involving unique problems related to science, business, reporting, and literature. Pr.: 21 hours of college Spanish or equiv. SPAN-771-0-1105

SPAN 772. The Hispanic World Today. (3) An investigation of selected social, political, and humanistic aspects of contemporary Hispanic culture. Pr.: 21 hours of college Spanish or equiv. SPAN-772-0-1105

SPAN 775. Cervantes. (3) Reading of the works of Cervantes and discussion of the literary and cultural background of the period. Pr.: 21 hours of college Spanish or equiv. SPAN-775-0-1105

SPAN 777. Hispanic Cultures in Second-Language Learning. (3) Emphasis on the study of Spanish culture and applications to the Spanish curriculum, including the development of materials. Pr.: 24 credits in Spanish at 200 or above or equiv. Same as EDCI 771. SPAN-777-0-1105

SPAN 778. Spanish and Spanish-American Literature in Second-Language Learning. (3) Analysis of literary texts from Spanish-speaking countries, with emphasis on the development of interpretive skills and application to the Spanish curriculum. Pr.: 24 credits in Spanish at 200 or above or equiv. SPAN-778-0-1105

SPAN 779. Seminar in Spanish. (3) A seminar with variable topics. Pr.: Senior standing or consent of the instructor. SPAN-779-0-1105

SPAN 799. Problems in Modern Languages. (Var.) SPAN-799-3-1101

Graduate credit

SPAN 899. Research in Modern Languages. (Var.) Pr.: 30 hours in one modern language or equiv. SPAN-899-4-1101

South Asian Languages

Undergraduate credit

URDU 171. Hindi/Urdu I. (4) I. Introduction to the structure of Hindi and Urdu, two languages which are nearly identical in the grammatical structure of their everyday spoken style. Hindi is the dominant language of northern India. Urdu is the national language of Pakistan, also understood throughout the Hindi area. URDU-171-0-1113

URDU 172. Hindi/Urdu II. (4) II. Continuation of Hindi/Urdu I with introduction of the Devanagari (Hindi and Sanskrit) script. Pr.: URDU 171. URDU-172-0-1113

URDU 273. Hindi/Urdu III. (4) I. Continuation of Hindi/Urdu II with gradual transition to more formal styles of language. Pr.: URDU 172. URDU-273-0-1113

URDU 274. Hindi/Urdu IV. (4) II. Continuation of Hindi/Urdu III with readings in Hindi or Urdu literature according to needs of students. Pr.: URDU 273. URDU-274-0-1113

Undergraduate and graduate credit in minor field

URDU 575. Hindi/Urdu V. (4) I, II, S. Individual study in Hindi or Urdu. Readings, composition, or conversational practice relevant to the student's interests and disciplinary needs. May be repeated for credit. Pr.: URDU 274. URDU-575-0-1113

Undergraduate and graduate credit
URDU 799. Problems in Modern Languages. (Var.) URDU-799-3-1101

Music

Jack Flouer,* Head

Professors R. Edwards,* Flouer,* Jackson,* Langenkamp,* Sloop,* Sutton,* R. Walker,* and White;* Associate Professors Fallin,* Funkhouser,* Parker,* Polich, and Sidorfsky;* Assistant Professors A. Cochran,* Finck, Littrell,* and Mortenson; Instructors J. Edwards, Houser, Rohrer, and Rushing; Adjuncts Betton, M. L. Cochran, Gibbons, and Wingfield; Emeriti: Professors Brookhart,* Shull,* Steinbauer,* W. Walker;* Assistant Professors Caine* and M. Walker.*

Undergraduate study

The Department of Music is a member, with institutional accreditation, of the National Association of Schools of Music.

Curricula in music education and performance with majors in music theatre, theory and composition, voice, piano, organ, strings, woodwind, percussion, and brass instruments are offered. Courses in music are available to any student enrolled in the University, subject to prerequisites listed in the course descriptions. Courses in performance do not require prerequisites for those not majoring in music; however, availability of instructor and fees for nonmajors are factors in securing performance instruction. This elective credit cannot be used later toward a music degree unless it meets the requirements of that course as they apply to those majoring in music. No more than two credits a semester will be granted for performance as an elective.

Entrance requirements for new and transfer students

Preliminary placement examinations in piano, the performance major, and theory must be taken by all students majoring in music regardless of the curriculum selected. Students will be advised as to the most appropriate field of concentration and the proper level of study as a result of examination.

In regard to transfer students, divisional hearings will determine the number of upper-level hours which will be accepted.

Bachelor of arts

120 hours required for graduation

The bachelor of arts with major in music emphasizes the liberal arts tradition. The program provides enough flexibility in electives for the student to meet other preprofessional requirements, and it thus may appeal to students whose professional

goals do not terminate with music. The minimum requirement in music is 48 hours, including the following:

| | | |
|-----------|--|---|
| MUSIC 201 | Styles II, Textures of Music | 4 |
| MUSIC 202 | Styles III, The Classical Period | 4 |
| MUSIC 213 | Styles IV, The Romantic Period | 4 |
| MUSIC 218 | Aural Skills Proficiency | 0 |
| MUSIC 398 | Musical Style of the Baroque | 4 |
| MUSIC 406 | Musical Style to 1600 (Medieval and Renaissance) | 4 |
| MUSIC 407 | Musical Style of the Twentieth Century | 4 |

Recital attendance is required for seven semesters (transfer students' records will be evaluated). The major program of music leading to the degree bachelor of arts may be elected with an emphasis in one of these areas: music literature, music theory and composition, or performance.

The music literature area requires 8 hours of electives in music history and music literature. In addition, 8 semester hours in a single performance area are required, of which half must be from the 400 level.

If the area is music theory and composition, the program calls for MUSIC 521 (three hours), 615, 616, 714, 3 semester hours elected in music literature, and 8 semester hours of piano, of which half must be from the 400 level.

If the field is performance, the program calls for MUSIC 615 and 616 plus 16 hours of an instrument or voice, of which half must be from the 400 level.

Participation in a music organization (instrumental or choral, depending on the major performance area) is required each semester, and the piano proficiency requirement must be passed before graduation.

Bachelor of music

126 hours required for graduation

A four-year program is offered with concentrations in voice, strings, wind or percussion instruments, music theatre, and theory/composition.

The general education requirements for this degree may be found at the beginning of the Arts and Sciences section of this catalog.

The basic requirements for all options are:

| | | |
|---------------------|---|---|
| MUSIC 201 | Styles II, Textures of Music | 4 |
| MUSIC 202 | Styles III, The Classical Period | 4 |
| MUSIC 213 | Styles IV, The Romantic Period | 4 |
| MUSIC 218 | Aural Skills Proficiency | 0 |
| MUSIC 398 | Musical Styles of the Baroque Period | 4 |
| MUSIC 406 | Musical Styles to 1600 (Medieval and Renaissance) | 4 |
| MUSIC 407 | Musical Styles of the Twentieth Century | 4 |
| MUSIC 473 | Seminar in Comprehensive Musicianship | 2 |
| MUSIC 417 | Conducting | 2 |
| MUSIC organizations | | 4 |
| Music elective | | 2 |
| Junior recital | | 0 |
| Senior recital | | 0 |

| | | |
|--|--|----|
| MUSIC 050 | Recital Attendance (7 semesters) . . . | 0 |
| MUSIC 060 | Piano Proficiency | 0 |
| Additional requirements for music theatre option: | | |
| MUSIC 255 | Voice | 9 |
| MUSIC 455 | Voice | 11 |
| MUSIC 285 | Italian Diction | 1 |
| and | | |
| MUSIC 287 | German Diction | 1 |
| or | | |
| MUSIC 465 | French Diction I | 1 |
| MUSIC 475 | Opera Workshop | 4 |
| MUSIC 492 | Methods and Materials of the Studio | 2 |
| MUSIC 207 | Piano Class II | 1 |
| or | | |
| MUSIC 255 | Piano | 1 |
| THTRE 260 | Stage Movement | 3 |
| THTRE 560 | Advanced Stage Movement | 3 |
| THTRE 261 | Fundamentals of Acting | 3 |
| THTRE 161 | Improvisation, 361 Intermediate Acting, or 761 Advanced Acting . . . | 3 |
| THTRE 267 | Fundamentals of Costuming and Makeup | 3 |
| THTRE 266 | Fundamentals of Technical Production | 3 |
| THTRE 671 | History of the Opera | 3 |
| THTRE 211 | Drama Participation | 2 |
| DANCE 165 | Ballet | 2 |
| Dance electives | | 2 |
| Secondary modern language | | 4 |
| Additional requirements for vocal performance: | | |
| Voice (half of which is from the 400 level) | | 28 |
| Piano Class or Piano | | 4 |
| MUSIC 474 | Problems in Musical Style and Music Pedagogy | 2 |
| MUSIC 615 | Canon and Fugue | 2 |
| MUSIC 616 | Twentieth Century Counterpoint . . . | 2 |
| MUSIC 492 | Methods and Materials of the Studio | 2 |
| Diction | | 4 |
| Vocal ensemble or Opera Theatre | | 4 |
| Additional music electives | | 3 |
| Primary modern language (2 additional courses) . . . | | 7 |
| Secondary modern language (1 course) | | 4 |
| Additional requirements for instrumental performance: (keyboard, strings, wind, and percussion instruments): | | |
| Instrumental performance (half of which is from the 400 level) | | 32 |
| Instrumental ensemble | | 4 |
| Secondary performance area | | 4 |
| MUSIC 474 | Problems in Musical Style and Music Pedagogy | 2 |
| MUSIC 714 | Advanced Orchestration | 2 |
| Additional music electives | | 3 |
| Additional non-music electives | | 10 |
| Additional requirements for theory/composition: | | |
| Major performance area (If piano is major area then 8 hours of a secondary performance area) | | 8 |
| MUSIC 255 | and/or 455 Piano | 8 |
| MUSIC 474 | Problems in Musical Style and Music Pedagogy | 2 |
| MUSIC 714 | Advanced Orchestration | 2 |
| MUSIC 521 | Composition | 12 |
| MUSIC 615 | Canon and Fugue | 2 |
| MUSIC 616 | Twentieth Century Counterpoint . . . | 2 |
| MUSIC 631 | Technology of the Electronic Music Studio | 2 |
| MUSIC 632 | Digital Sound Synthesis | 2 |
| Additional music electives | | 7 |
| Additional non-music electives | | 10 |

Bachelor of music education

134–135-hours required for graduation, depending on emphasis

The program of study leading to this degree is a nine-semester curriculum designed to prepare music teachers for grades K–12.

With careful planning and enrollment during summer session(s) all requirements may be completed in four years. Within this

curriculum there are two emphases—vocal/choral music, and instrumental music.

Professional educational requirements: DED 102

EDAF 215, 315, 323, 410, and 525
EDCI 318, 376, 455, 477, and 582

ENGL 100 and 120 (or ENGL 110 and 125), SPCH 106, and EDAF 215 are required before admittance to EDAF 315. See education requirements for admittance to teacher education.

Music requirements for all options:

Comprehensive musicianship—

MUSIC 200, 201, 202, 213, 218, 398, 406, 407, 417, and 473

Music education—MUSIC 511, 512, and 670

Performance—MUSIC 060, 501 or 502, and study of the major instrument or voice and enrollment in a major choral or instrumental organization each semester except the professional semester. In addition, at least one semester in a small ensemble is required.

Additional music requirements for instrumental emphasis:

Performance—MUSIC 203, 204, 206, 207, and 9 semester hours chosen according to the major instrument from: MUSIC 232, 233, 234, 235, 427, 428, and 429

Enrollments in major organizations must include at least two semesters in a choral organization; upon the recommendation of the advisor, one additional semester of individual or class instruction in voice may be substituted.

Additional requirements for vocal/choral emphasis:

Performance—If voice is the major performance area, MUSIC 232, 233, 234, 235, 285, and 287 or 465; 4 hours of keyboard. If keyboard is the major performance area, MUSIC 203, 204, 210, 211, 232, 233, 234, 235, and 350 (two semesters)

Enrollments in major organizations must include at least two semesters in an instrumental organization; upon the recommendation of the advisor, one semester of advanced instrumental techniques classes may be substituted.

Requirements in general education are stated earlier in the College of Arts and Sciences section.

General regulations for all performance areas

As a part of performance requirements, studio and divisional seminars and general student recitals are held regularly. Each student is required to perform at least once a semester either in a studio seminar or in a student recital. All private study for credit will culminate in a jury exam each term.

Each division faculty maintains the right to advise students to discontinue performance study in that particular curriculum if the students have not demonstrated the necessary degree of progress.

For specific divisional requirements, each student should request a copy of detailed policies.

Required recital attendance

Attendance at a minimum of 15 recitals or concerts per semester for seven semesters is required for graduation. (Transfer students' records will be evaluated.)

Fees for private music lessons

University students enrolled in the bachelor of music, bachelor of music education, or the bachelor of arts in music degrees with a major in music are exempt from fees for private music lessons and music practice facilities.

University students not majoring in one of the three music curricula may take private music instruction (pending availability of staff and facilities) by paying fees as listed in the Fees section of this catalog.

Graduate study

The Department of Music offers work leading to the master of music degree.

Admission to the graduate program normally requires a B.M., B.M.E., B.S. in music, or B.A. in music, with a curriculum substantially equivalent to that of this University. All entering students are encouraged to take the advanced music test of the Graduate Record Examinations.

Emphasis in the graduate program may be placed on music education, performance, pedagogy, theory and composition, or music history and literature. All areas of emphasis center on a common core of study, with ample flexibility for the development of personal interests. The degree requires a minimum of 32 hours, including a master's report (this may be a recital) or master's thesis. Students emphasizing music education may choose a 36-hour degree without report or thesis.

Details concerning the graduate program and opportunities for financial aid may be obtained by writing to the coordinator of graduate studies, Department of Music, 109 McCain Auditorium, Manhattan, Kansas 66506-4702.

Courses in comprehensive musicianship

Undergraduate credit

The musical styles courses are required of all undergraduate music majors at KSU and coordinate the many facets of the student's musical training. The structure of this program removes the traditional division between history and theory and integrates the student's study by stylistic

periods, prefaced by a concentrated introduction to musical textures and basic technical skills. Included in each course are lectures in theory and history as well as laboratory work in performance, conducting, keyboard application, aural skills, analysis, and creative writing.

Styles courses are governed by the philosophy that (1) all musicians need practical skills in performance, composition, and analysis; (2) the music student should recognize a coherent link between all facets of his/her musical training (including those requirements outside the styles courses); and (3) all musical studies should, as closely as possible, relate to one's own time.

MUSIC 200. Styles I, Elements of Music. (3) I, II. The musical language and its relationship between mind and ear. Formation of interval, scale, and chord patterns; basic notational procedures. MUSIC-200-1-1004

MUSIC 201. Styles II, Textures of Music. (4) I, II. An introduction to musical elements and historical practice with emphasis on texture as a uniting force; stylistic procedures as applied to sound parameters by the major composers. Pr.: MUSIC 200 or tested knowledge of basic music theory. MUSIC-201-1-1004

MUSIC 202. Styles III, The Classical Period. (4) I, II. History and performance practices of the late eighteenth century. Diatonic chord structures and nonharmonic tones, introduction to modulation. Scoring for the piano; small forms. Pr.: MUSIC 201. MUSIC-202-1-1004

MUSIC 213. Styles IV, The Romantic Period. (4) I, II. Historical survey of the nineteenth century. Chromatic harmony, modulations, score reading, and large homophonic forms. Composition for piano with voice or solo instrument. Pr.: MUSIC 202. MUSIC-213-1-1006

MUSIC 218. Aural Skills Proficiency. (0) I, II. Required for graduation of all music majors. Pr.: MUSIC 213 or conc. enrollment. MUSIC-218-1-1006

MUSIC 398. Musical Styles of the Baroque Period. (4) II. Historical survey from 1600 to 1750; counterpoint with emphasis on invention, canon, and fugue; scoring for strings. Pr.: MUSIC 213. MUSIC-398-1-1006

MUSIC 406. Musical Styles to 1600 (Medieval and Renaissance). (4) I. Historical survey, modal counterpoint, early notational systems, performance practice, improvisational frameworks, development of instruments and forms. Pr.: MUSIC 213. MUSIC-406-1-1006

MUSIC 407. Musical Style of the Twentieth Century. (4) II. Modern music; contemporary practice and aesthetics; polytonality, serial techniques, electronic music. Pr.: MUSIC 398. MUSIC-407-1-1006

MUSIC 473. Seminar in Comprehensive Musicianship. (2) I, II, S. A study of music technology and computer applications; popular and non-Western styles. Pr.: MUSIC 213. Required for music education majors. MUSIC-473-1-1006

MUSIC 474. Problems in Musical Style and Music Pedagogy. (2) I, II, S. Individual projects relating to a specific style or pedagogical problem of the performance major or minor. Pr.: MUSIC 213. MUSIC-474-2-1004

Courses in music history, literature, and theory

Undergraduate credit

MUSIC 100. Music Fundamentals. (3) I, II, S. Elementary instruction in the theory of music. MUSIC-100-1-1004

MUSIC 150. Music Listening Laboratory. (1-2) I, II, S. A direct listening laboratory. Includes recorded musical works of all major periods and styles. Performances from the major University organizations, faculty artists, and special guests. Limited to nonmusic majors. MUSIC-150-1-1005

MUSIC 220. Topics in Music. (1-3) Offered on demand. Exploration of the musical dimensions of a particular topic or theme. Topics vary. May be repeated once. MUSIC-220-4-1004

MUSIC 245. Introduction to American Music. (3) II. An introduction to the functions of music in American society and the elements of music, including a survey of the development of various types and styles of music in America. For nonmusic majors only. MUSIC-245-0-1005

MUSIC 250. Introduction to Music. (3) I, II, S. Elements of music as represented in selected masterpieces of the standard concert repertoire, designed to heighten the perception and the enjoyment of the listener who has limited musical knowledge. MUSIC-250-0-1005

MUSIC 310. History of Musical Instruments. (2) Offered on demand, only in Intersections, through TELENET, or off-campus. The development of musical instruments in each period of Western music. Pr.: MUSIC 150 or 250. MUSIC-310-1-1005

MUSIC 385. History of the American Popular Song. (2) Offered on sufficient demand. The vigor and musical inventiveness of this unique American art form including the melodic, rhythmic, and harmonic aspects of the songs of Jerome Kern, Irving Berlin, George Gershwin, and others. Pr.: MUSIC 150 or MUSIC 250. MUSIC-385-0-1005

MUSIC 390. Special Studies in Music. (1-3) I, II, S. Pr.: Background of courses needed for studies undertaken. MUSIC-390-4-1004

MUSIC 399. Honors Seminar. (3) II. On sufficient demand. For selected sophomores. MUSIC-399-1-1005

MUSIC 420. History of Jazz. (3) On sufficient demand. Survey of jazz styles and personalities. For music majors and nonmajors. Pr.: MUSIC 150, 250, or equiv. MUSIC-420-0-1005

MUSIC 424. Jazz in Kansas City and the Southwest. (2-3) Offered on demand, only in Intersections, through TELENET, or off-campus. The history and development of jazz styles in Kansas City and the southwestern United States, emphasizing the influence on styles of other geographic areas. Pr.: MUSIC 150. MUSIC-424-0-1005

MUSIC 425. Topics in Jazz. (Var.) Offered on sufficient demand. Big bands; jazz pianists and styles; survey of combo jazz styles, etc. Pr.: MUSIC 150. MUSIC-425-4-1004

MUSIC 470. Songwriting. (3) Offered on sufficient demand. Composition of original small song forms including preparation of lead sheet and vocal score using guitar chord symbols. Pr.: MUSIC 100. For nonmusic majors only. MUSIC-470-0-1004

MUSIC 498. Honors Tutorial in Music. (1-3) I, II. Individual directed research and study of a topic in music, normally as a preliminary to writing a senior honors thesis. May be repeated once to a total of 3 hours. Pr.: Sophomore standing, membership in the honors program of the College of Arts and Sciences, and permission of the instructor. MUSIC-498-1-1005

MUSIC 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. MUSIC-499-1-1005

Undergraduate and graduate credit

MUSIC 570. Musical Comedy. (3) On sufficient demand. The history of operetta and music comedy from Offenbach to the present. Offered jointly by Departments of Music and Speech. Same as THTRE 570. MUSIC-570-0-1006

MUSIC 601. Western Music before 1750. (2-3) I, alternate S. A survey of the development of Western music from early Greek civilization to 1750. Pr.: MUSIC 398 and 406. MUSIC-601-0-1006

MUSIC 614. Harmony and Tonal Counterpoint. (1) Recommended for graduate students in music who desire additional work in the harmonic aspects of 18th-century counterpoint. Concurrent enrollment in MUSIC 615 required. MUSIC-614-0-1004

MUSIC 615. Canon and Fugue. (2) I, S. Counterpoint in eighteenth century style. Pr.: MUSIC 398, consent of instructor. MUSIC-615-0-1004

MUSIC 616. Twentieth-Century Counterpoint. (2) II, S. Contrapuntal devices used by twentieth-century composers; serial techniques. Pr.: MUSIC 398, consent of instructor. MUSIC-616-0-1004

MUSIC 620. Music Calligraphy and Score Preparation. (2) Tools and procedures for professional preparation of music manuscript in facsimile editions. Computer applications for typesetting and music publishing. Pr.: MUSIC 201. MUSIC-620-0-1006

MUSIC 631. Technology of the Electronic Music Studio. (2) I, S. Instrumentation and systematic procedures as applied to the construction of electronic music. Principles of voltage-controlled systems, synchronous tape machines, and audio mixing. Individual and team projects. Pr.: MUSIC 521, consent of instructor. MUSIC-631-0-1004

MUSIC 632. Digital Sound Synthesis. (2) On sufficient demand. Exploration of real-time interactive systems. Theory and application pertaining to the creation of instruments and scores using additive and FM techniques. Team projects. Pr.: MUSIC 631. MUSIC-632-3-1004

MUSIC 650. History of the Opera. (3) II. A study of selected masterpieces of musical drama, with emphasis on the relationship of music and drama, and on the unique qualities of opera as a collective artwork. Pr.: MUSIC 201 or MUSIC 250. Same as THTRE 671. MUSIC-650-0-1006

MUSIC 702. Style Analysis. (2-3) On sufficient demand. Training in a comprehensive, systematic analytical approach to all style periods, and in verbalizing analytical perceptions. Pr.: MUSIC 407. MUSIC-702-0-1004

MUSIC 704. Symphonic Literature. (3) II. The development of orchestral music from the late Baroque to the present, with emphasis on selected symphonies of the late eighteenth and nineteenth centuries. Pr.: MUSIC 407. MUSIC-704-0-1006

MUSIC 705. Chamber Music Literature. (3) II, in alternate years. A selected survey of masterpieces of small ensemble music from 1750 to the present. Special emphasis on the string quartet. Pr.: MUSIC 407. MUSIC-705-0-1006

MUSIC 706. Song Literature. (3) II, in alternate years. Survey, by historical period and national style, of major solo vocal works. Pr.: MUSIC 407. MUSIC-706-0-1006

MUSIC 708. Choral Literature. (3) II, in alternate years. A study of standard choral masterpieces in both large and small forms from 1450 to the present. Pr.: MUSIC 407. MUSIC-708-0-1006

MUSIC 711. Practical Composition and Arranging. (2) On sufficient demand. Explanation of styles and techniques applicable to contemporary commercial music. Practical arranging for the stage band. Pr.: MUSIC 213 or consent of instructor. MUSIC-711-0-1004

MUSIC 714. Advanced Orchestration. (2) On sufficient demand. The study of orchestra and band scores. Exercises in orchestrating this type of music for different choirs of instruments, as well as scoring for full orchestra and symphonic band. Pr.: MUSIC 503 or consent of instructor. MUSIC-714-0-1004

MUSIC 737. Organ Literature. (3) II, in alternate years. A survey of significant compositions from the Renaissance to the present, with emphasis on performance practice. Pr.: MUSIC 407. MUSIC-737-0-1006

MUSIC 738. Piano Literature. (3) I, in alternate years. Selective survey of music for piano from 1750 to the present. Pr.: MUSIC 407. MUSIC-738-0-1006

MUSIC 740. Studies in Music Literature. (3) On sufficient demand. Study of the repertory of a selected musical genre or medium of performance. Pr.: MUSIC 407. MUSIC-740-0-1006

MUSIC 766. Seminar in the Life and Works of an Individual Composer. (3) I. Study of the career and achievements of a selected composer of major stature. Pr.: MUSIC 407. MUSIC-766-0-1006

MUSIC 767. Topics in American Music. (3) On sufficient demand. Studies of the various genres of American Music. Pr.: MUSIC 407. MUSIC-767-0-1006

MUSIC 799. Problems in Music. (Var.) I, II, S. Individual guided work in a selected area. Pr.: Six hours graduate credit in music. MUSIC-799-4-1004

Graduate credit

MUSIC 801. Introduction to Graduate Study in Music. (2) I, S. Library procedures, bibliography, research methods, and practice in preparing scholarly papers. Required of all graduate students in music. Pr.: At least 30 hours of music theory and music history. MUSIC-801-0-1006

MUSIC 802. Seminar in Music Theory. (3) I, alternate S. Comparison of major theoretical treatises and historical compositional practices; practical application for the modern musician. Pr.: Twenty hours music theory. MUSIC-802-0-1004

MUSIC 803. Seminar in Music History. (2) S. The history of music with emphasis on the correlation of stylistic factors and man's cultural environment. Pr.: MUSIC 407. MUSIC-803-0-1006

MUSIC 804. Advanced Analysis. (3) In alternate S. An in-depth study of works by later Romantic and modern composers: techniques and styles in relation to form. Pr.: Twenty hours music theory. MUSIC-804-0-1004

MUSIC 830. Seminar in Medieval and Renaissance Music. (3) II. In-depth investigation of a selected area or problem in medieval or Renaissance music. Emphasis on individual research. Pr.: MUSIC 601 and consent of instructor. MUSIC-830-0-1006

MUSIC 832. Seminar in Baroque Music. (3) I. In-depth investigation of a selected area or problem in Baroque music. Emphasis on individual research. Pr.: MUSIC 601 and consent of instructor. MUSIC-832-0-1006

MUSIC 834. Seminar in Classical Music. (3) II. In-depth investigation of a selected area or problem in classical music. Emphasis on individual research. Pr.: MUSIC 601 and consent of instructor. MUSIC-834-0-1006

MUSIC 836. Seminar in Romantic Music. (3) II. In-depth investigation of a selected area or problem in Romantic music. Emphasis on individual research. Pr.: MUSIC 601 and consent of instructor. MUSIC-836-0-1006

MUSIC 838. Seminar in 20th-Century Music. (3) II, alternate years. In-depth investigation of a selected area or problem in twentieth-century music. Emphasis on individual research. Pr.: MUSIC 601, consent of instructor. MUSIC-838-0-1006

MUSIC 898. Master's Report in Music. (2) I, II, S. Independent directed research leading to master's report. Pr.: Sixteen hours graduate credit in music. MUSIC-898-1-1006

MUSIC 899. Research in Music. (Var.) I, II, S. Independent research that may lead to master's thesis. Pr.: Sixteen hours graduate credit in music. MUSIC-899-4-1006

Music education

Undergraduate credit

MUSIC 232. Woodwind Techniques and Materials. (1) I, II, S. A beginning course in the fundamentals of playing and methods for teaching woodwind instruments. For music majors only, and not open to woodwind majors. MUSIC-232-1-1004

MUSIC 233. Brass Techniques and Materials. (1) I, II, S. A beginning course in the fundamentals of playing and methods for teaching brass instruments. For music majors only, and not open to brass majors. MUSIC-233-1-1004

MUSIC 234. String Techniques and Materials. (1) I, II, S. A beginning course in the fundamentals of playing and methods for teaching stringed instruments. For music majors only, and not open to string majors. MUSIC-234-1-1004

MUSIC 235. Percussion Techniques and Materials. (1) I, II, S. The fundamentals of playing and methods of teaching percussion instruments. For music majors only, and not open to percussion majors. MUSIC-235-1-1004

MUSIC 405. Music for Elementary Teachers. (3) I, II, S. The contribution of music to child development in elementary schools. A study of music literature suited to children through the development of purposive listening and the expressive phases of music including rhythmic response, singing, playing, reading, and writing. Pr.: Junior standing or consent of instructor. MUSIC-405-0-0832

MUSIC 427. Advanced String Techniques and Materials. (1-2) II. Playing and teaching skills beyond fundamentals and presentation of materials suitable for private and public school instruction at the secondary level. Required of all instrumental majors in music education. Pr.: MUSIC 234. MUSIC-427-1-1004

MUSIC 428. Advanced Woodwind Techniques and Materials. (1-2) II. Playing and teaching skills beyond fundamentals and presentation of materials suitable for private and public school instruction at the secondary level. Required of all instrumental majors in music education. Pr.: MUSIC 232. MUSIC-428-1-1004

MUSIC 429. Advanced Brass Techniques and Materials. (1-2) I. Playing and teaching skills beyond fundamentals and presentation of materials suitable for private and public school instruction at the secondary level. Required of all instrumental majors in music education. Pr.: MUSIC 233. MUSIC-429-1-1004

Undergraduate and graduate credit

MUSIC 511. Music in the Schools, K-6. (4) II. The music curriculum in grades K-6, including a study of the musical characteristics of children and materials and techniques for teaching instrumental, vocal, and general music at this level. Pr.: Admission to teacher education and junior standing in music. MUSIC-511-0-0832

MUSIC 512. Music Program in Junior/Senior High Schools. (4) I. Organization and administration of the comprehensive music program in junior and senior high schools; including the study of vocal and instrumental ensemble development, as well as techniques and materials for other types of music classes. Pr.: Admission to teacher education and junior standing in music. MUSIC-512-0-0832

MUSIC 670. Advanced Studies in Music Education. (2) I, II, S. Advanced undergraduate studies of various topics related to the teaching of music in grades K-12. May be repeated for credit when topics vary. Pr.: MUSIC 511 or 512. MUSIC-670-0-0832

Graduate credit

MUSIC 805. Theories of Music Teaching. (3) On sufficient demand. A survey of the history of music teaching in the United States, with emphasis on the relationship of various theories of music, musical perception, and musical cognition to current practices in teaching music at all levels. Pr.: Nine hours graduate credit in music. MUSIC-805-0-0832

MUSIC 808. Research in Music Education. (3) II. An introduction to historical, descriptive, and experimental research in music education; including a study of techniques for the evaluation of music teaching and learning. Pr.: MUSIC 805. MUSIC-808-0-0832

MUSIC 809. Seminar in Music Education. (3) I, S. Advanced studies of various topics related to the instrumental, choral, and general music programs in elementary and secondary schools. May be repeated when topics vary. Pr.: MUSIC 805 or graduate standing in music education and consent of the instructor. MUSIC-809-0-0832

Workshops in music

Undergraduate credit

MUSIC 489. Workshop in Music. (1-2) S. Specialized interest areas for undergraduate students only. Pr.: Consent of instructor. MUSIC-489-2-0832

Graduate credit

MUSIC 811. Symposium in Music. (1-3) S. Intensive short-term studies of various topics in music, featuring presentations by nationally known scholars in the field. May be repeated for credit when topics vary. MUSIC-811-2-0832

MUSIC 814. Workshop in Music. (1-2) S. Advanced studies in specialized interest areas. Students may enroll in different areas simultaneously. MUSIC-814-2-0832

Organizations and ensembles

Undergraduate credit

MUSIC 111. Concert Choir. (1) I, II. Admission by audition. MUSIC-111-5-1004

MUSIC 115. Marching Band. (1) I, II. Admission by audition. MUSIC-115-5-1004

MUSIC 116. Concert Band. (1) II. Open to all interested wind and percussion performers without audition. MUSIC-116-5-1004

MUSIC 117. Symphonic Wind Ensemble. (1) I, II, S. A select performing organization. Admission by audition. MUSIC-117-5-1004

MUSIC 120. Chamber Singers. (1) I, II, S. Admission by audition. MUSIC-120-5-1004

MUSIC 121. Collegiate Chorale. (1) I, II, S. Open to all interested singers. Audition determines membership in other choral organizations. MUSIC-121-5-1004

MUSIC 125. K-State Singers. (1) I, II. Admission by audition. (Not open to music majors.) MUSIC-125-5-1004

MUSIC 130. Symphony Orchestra. (1) I, II, S. Admission by audition. MUSIC-130-5-1004

MUSIC 131. Theatre Orchestra. (1) I, II. Admission by audition. MUSIC-131-5-1004

MUSIC 135. Men's Glee Club. (1) I, II. Admission by audition. MUSIC-135-5-1004

MUSIC 140. Women's Glee Club. (1) I, II. Admission by audition. MUSIC-140-5-1004

MUSIC 280. Lower-Division Ensemble Performance. (1) I, II, S. Instruction is offered each semester in the following areas: brass, chamber music, concert jazz, jazz combo, strings, winds, and vocal ensemble. Admission is by audition and students may enroll in more than one ensemble simultaneously. MUSIC-280-5-1004

MUSIC 298. Jazz Improvisation I. (1) I, II. Fundamentals of jazz harmony with emphasis on simple chord progressions, blues scales, and some modes. Performance of improvised solos based on "standards" and original. May be repeated once for credit. Pr.: Consent of instructor. MUSIC-298-0-1004

MUSIC 299. Jazz Improvisation II. (1) I, II. Continuation of Jazz Improvisation I, with emphasis on more complex chord progressions, altered scales, and other modes. May be repeated once for credit. Pr.: MUSIC 298 or consent of instructor. MUSIC-299-0-1004

MUSIC 350. Studio Accompanying. (1) On sufficient demand. Piano student assigned to studio instructor. Accompanies lessons for at least two hours a week. Ensemble credit for pianists. Pr.: Consent of instructor. MUSIC-350-1-1004

MUSIC 351. Recital Accompanying. (1) On sufficient demand. Piano student assigned to a music major preparing for graduation recital. Pianist accompanies student in lessons and presents the formal public program as course requirement. Pr.: Consent of instructor. MUSIC-351-1-1004

MUSIC 400. Concert Choir. (1) I, II. Admission by audition. MUSIC-400-5-1004

MUSIC 401. Concert Band. (1) I, II, S. Open to all interested wind and percussion performers without audition. MUSIC-401-5-1004

MUSIC 402. Symphonic Wind Ensemble. (1) I, II. A select performing organization. Admission by audition. MUSIC-402-5-1004

MUSIC 403. Collegiate Chorale. (1) I, II, S. Open to all interested singers. Audition determines membership in other choral organizations. MUSIC-403-5-1004

MUSIC 404. Symphony Orchestra. (1) I, II, S. Admission by audition. MUSIC-404-5-1004

MUSIC 408. Men's Glee Club. (1) I, II. Admission by audition. MUSIC-408-5-1004

MUSIC 409. Women's Glee Club. (1) I, II. Admission by audition. MUSIC-409-5-1004

MUSIC 411. Marching Band. (1) I, II. Admission by audition. MUSIC-411-5-1004

MUSIC 414. Theatre Orchestra. (1) I, II. Admission by audition. MUSIC-414-5-1004

MUSIC 415. Chamber Singers. (1) I, II, S. Admission by audition. MUSIC-415-5-1004

MUSIC 475. Opera Workshop. (Var.) I, II, S. Principles and techniques of operatic and musical theatre production, with emphasis on class rehearsal and performance of selected scenes from opera and musical drama; brief survey of the history of opera. Offered jointly by the Departments of Music and Speech. Vocal ensemble credit may be earned in this course. Same as SPCH 475. MUSIC-475-1-1004

MUSIC 480. Upper-Division Ensemble Performance. (1) I, II, S. Instruction is offered each semester in the following areas: brass, chamber music, concert jazz, jazz combo, strings, winds and vocal ensemble. Admission is by audition and students may enroll in more than one ensemble simultaneously. MUSIC-480-5-1004

MUSIC 490. Collegium Musicum. (1) I, II, S. An ensemble devoted primarily to the performance of music written before 1700. Authentic instruments used when possible. Pr.: Consent of instructor. MUSIC-490-5-1004

Graduate credit

MUSIC 838. Opera Theatre. (Var.) I, II, S. Opera workshop for graduates. Pr.: Baccalaureate degree and previous experience at the undergraduate level. MUSIC-838-1-1004

MUSIC 839. Vocal Ensemble. (1) I, II, S. Performance and study with established University vocal organization or small ensemble. MUSIC-839-5-1004

MUSIC 840. Instrumental Ensemble. (1) I, II, S. Performance and study with an established University instrumental organization or in a small ensemble. MUSIC-840-5-1004

MUSIC 841. Collegium Musicum. (1) I, II, S. An ensemble devoted primarily to the performance of music written before 1700. Authentic instruments used when possible. MUSIC-841-5-1004

MUSIC 842. Concert Choir. (1) I, II. Pr.: Baccalaureate degree and previous experience at the undergraduate level. MUSIC-842-5-1004

MUSIC 843. Symphony Orchestra. (1) I, II. Pr.: Baccalaureate degree and previous experience at the undergraduate level. MUSIC-843-5-1005

MUSIC 844. Concert Jazz Ensemble. (1) I, II, S. Pr.: Baccalaureate degree and previous experience at the undergraduate level. MUSIC-844-5-1005

MUSIC 845. Symphonic Wind Ensemble. (1) I, II, S. Pr.: Baccalaureate degree and previous experience at the undergraduate level. MUSIC-845-5-1005

Performance classes

Undergraduate credit

MUSIC 050. Recital Attendance. (0) I, II. MUSIC-050-0-0000

MUSIC 060. Piano Proficiency. (0) I, II, S. Required for graduation of all music majors. MUSIC-060-2-1004

MUSIC 203. Voice Class I. (1) I, II. Not for voice majors. MUSIC-203-1-1004

MUSIC 204. Voice Class II. (1) I, II. Not for voice majors. MUSIC-204-1-1004

MUSIC 206. Piano Class I. (1) I, II, S. For freshmen and transfer music students with no piano background. Sections also available for nonmusic majors and nondegree students. MUSIC-206-1-1004

MUSIC 207. Piano Class II. (1) I, II, S. For freshmen and transfer students with some piano background, as well as those who have failed some or all of the Piano Proficiency Exam. MUSIC-207-1-1004

MUSIC 210. Voice Class III. (1) I, II. Not for voice majors. MUSIC-210-1-1004

MUSIC 211. Voice Class IV. (1) I, II. Not for voice majors. MUSIC-211-1-1004

MUSIC 285. Italian Diction. (1) I. Rules for pronouncing and translating Italian vocal texts. MUSIC-285-0-1004

MUSIC 287. German Diction. (1) I. Rules for pronouncing and translating German vocal texts. MUSIC-287-0-1004

MUSIC 391. Keyboard Pedagogy. (2) I, II, S. A systematic study of pedagogy which examines effective teaching methods and aids in the development of a philosophy of professional teaching. Pr.: Keyboard majors with conc. enrollment in MUSIC 450, 446, or 443. MUSIC-391-3-1004

MUSIC 417. Conducting. (2) I, II, S. Techniques of the baton; gestures, signs, and cues as generally used in conducting choral and instrumental organizations. Includes essentials of technique and interpretation in both choral and instrumental types of ensemble performance. For music majors only. Required before admission to student teaching. Pr.: MUSIC 406. MUSIC-417-1-1004

MUSIC 465. French Diction I. (1) I. Rules for pronouncing and translating French vocal texts. MUSIC-465-0-1004

MUSIC 467. French Diction II. (1) II. Rules for pronouncing and translating French vocal texts. MUSIC-467-0-1004

MUSIC 492. Methods and Materials for the Studio. (2) I, II, S. Methods of teaching fundamental techniques; selection of teaching materials outlining courses of study. For undergraduate students in performance

curricula. Taught in divisions according to the major. Practical application through supervised studio teaching. Pr.: MUSIC 391, or consent. MUSIC-492-2-1004

Undergraduate and graduate credit

MUSIC 501. Half Recital. (0) I, II, S. Public performance; vocal or instrumental with suggested performing time of 25 minutes. MUSIC-501-1-1004

MUSIC 502. Full Recital. (0) I, II, S. Public performance; vocal or instrumental with suggested performing time of 50 minutes. MUSIC-502-1-1004

Graduate credit

MUSIC 828. Methods and Materials for the Studio. (1-3) I, II, S. Methods of teaching fundamental techniques; selection of teaching materials outlining courses of study. For graduate students in performance curricula. Taught in divisions according to the major. Practical application through supervised studio teaching. Pr.: MUSIC 391 or MUSIC 492. May be repeated for a maximum of 3 hours. MUSIC-828-2-1004

MUSIC 859. Advanced Conducting. (Var.) I, II, S. Pr.: MUSIC 417 and consent of instructor. MUSIC-859-3-1004

MUSIC 885. Advanced Diction. (1) On sufficient demand. Concentrated study of Italian, German, and French diction for singing. Materials are related to work in the voice studio, and concurrent registration in MUSIC 886 is required. Pr.: MUSIC 466. May be repeated once. MUSIC-885-0-1004

Studio Performance

MUSIC 251. Pre-Performance Study. (Var.) I, II, S. For students who do not meet standards for regular performance study. MUSIC-251-3-1004

MUSIC 255. Lower-Division Performance. (Var.) I, II, S. Instruction is offered every semester in voice and each of the following instruments: baritone, bassoon, clarinet, double bass, early winds, flute, french horn, guitar, harp, harpsichord, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, viola da gamba, violin and violoncello. Students may enroll in more than one instrument simultaneously and may earn 1 to 4 hours per semester in each instrument. MUSIC-255-3-1004

MUSIC 455. Upper-Division Performance. (Var.) I, II, S. Instruction is offered every semester in voice and each of the following instruments: baritone, bassoon, clarinet, double bass, early winds, flute, french horn, guitar, harp, harpsichord, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, viola da gamba, violin and violoncello. Students may enroll in more than one instrument simultaneously and may earn 1 to 4 hours per semester in each instrument. MUSIC-455-3-1004

MUSIC 521. Composition. MUSIC-521-3-1004

Undergraduate and graduate credit

MUSIC 641. Secondary Performance Area. (1-2) For graduate students who wish to study an instrument (or voice) other than the major performance area. Pedagogical methods and fundamentals are stressed. MUSIC-641-3-1004

Graduate credit

MUSIC 855. Graduate-Level Performance. (Var.) I, II, S. Instruction is offered every semester in voice and each of the following instruments: baritone, bassoon, clarinet, double bass, early winds, flute, french horn, harpsichord, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, viola da gamba, violin and violoncello. Students may enroll in more than one instrument simultaneously and may earn 1 to 4 hours per semester in each instrument. MUSIC-855-3-1004

Philosophy

Robin Smith, Head

Professors Reagan,* Smith,* and Tilghman;* Associate Professors Exdell,* Hamilton,* and Scheer;* Assistant Professors Bassett,* Merrill,* O'Neil,* and Superson; Emeritus: Professor Miller.*

Philosophy is the study of the intellectual foundations of virtually every area of human thought and endeavor. Over the centuries philosophers have examined, for example, the nature and justification of moral values, religious and scientific explanations of the world, the rationality of social institutions, and the nature of reasoning and argument. The program in philosophy gives students an understanding of traditional philosophical subjects such as these. It also helps students develop critical habits of thinking and skill in understanding complex issues. Consequently, philosophy is an appropriate subject around which to organize a general education for any purpose.

Undergraduate study

The Department of Philosophy offers a variety of options within the major program to provide flexibility in organizing a course of studies with philosophy at its center. In addition to the traditional major in philosophy there are: pre-professional options designed to meet the special needs of students aiming for careers in law, business, and the ministry; and the interdisciplinary option that gives students whose interests do not coincide with traditional disciplinary lines the opportunity to design a course of study that fits their special concerns.

All philosophy students are required to take the core curriculum:

One course in logic:

| | | |
|-----------|-------------------------------|---|
| PHILO 110 | Introduction to Formal Logic | 3 |
| | or | |
| PHILO 220 | Symbolic Logic I | 3 |
| | or | |
| PHILO 510 | Symbolic Logic II | 3 |
| | and | |
| PHILO 300 | History of Ancient Philosophy | 3 |
| PHILO 301 | History of Modern Philosophy | 3 |
| PHILO 555 | Ethical Theories | 3 |

Traditional philosophy option (B.A. only)

This option is for students who are interested in a traditional liberal arts course of study or who desire to do graduate study in philosophy. Thirty-six hours in philosophy are required: the core curriculum (the logic course must be PHILO 220, Symbolic Logic I) and 24 additional hours in philosophy, including at least 9 hours at or above the 600 level and at least 9 additional hours at or above the 400 level.

Philosophy: pre-law (B.A. or B.S.)

While no one major emphasis in college is given preference by law school admission boards, law schools recognize the value of philosophy for refining skills in expression, comprehension, and critical thinking. According to the *Pre-Law Handbook*, "The free and spirited consideration of philosophical questions is almost the model for legal training."

The philosophy department requires that students have a well-balanced curriculum in other areas suitable as preparation for law school, including the social sciences, history, and literature. In addition to the college requirements for either the B.A. or B.S. degree, students must take 27 hours of philosophy: the core curriculum, and 15 additional hours at or above the 400 level, including PHILO 535, Philosophy of Law, and either PHILO 650, Philosophy of Social Science, or PHILO 525, Social and Political Philosophy.

Philosophy: pre-business (B.A. or B.S.)

The pre-business option is designed for the student who plans to do further work in a college of business leading to a master's in business administration (M.B.A.). This program has been developed in accordance with the results of a number of surveys in professional business journals rate this type of program an excellent preparation for a career in business leadership.

For requirements for admission to the M.B.A. program, see the College of Business Administration section of this catalog. Courses which satisfy these requirements will also partially satisfy requirements for the B.A. and B.S. degrees in the College of Arts and Sciences. The following curriculum meets the admission requirements of Kansas State University's M.B.A. program:

Philosophy, 24 hours, including: core curriculum; and 12 additional hours in philosophy at or above the 400 level, including PHILO 545, Philosophy of Economics, and either PHILO 525, Social and Political Philosophy, or PHILO 535, Philosophy of Law.

Philosophy: pre-ministry (B.A. only)

The pre-ministry option in philosophy is a nonsectarian program designed for students who are interested in the religious ministry as a profession. Students will be advised on courses in psychology, sociology, and literature which satisfy the general college requirements and are recommended by most American schools of theology. The requirements are as follows: 30 hours of philosophy including the core curriculum; 15 additional hours in philosophy at or above the 400 level, including PHILO 515, Philosophy of Religion, and PHILO 635,

Metaphysics; and three courses in other disciplines, approved by the department, in which religion is studied.

Interdisciplinary options (B.A. or B.S.)

These options permit students to combine a philosophy major with a concentration of studies in some other general area. There are no specific limitations of the area of study; it does not, for example, have to fall within a single department. However, it should encompass a group of courses with some underlying theme. Typical interdisciplinary areas of concentration are the various social sciences, history, the life sciences and natural sciences, psychology, journalism, language and literature, art and design, mathematics, and linguistics.

Students develop their programs in consultation with a faculty member of the philosophy department. All programs must be approved by the department. The general requirements are as follows: 24 hours of philosophy, including the core curriculum and 12 additional hours above the 400 level; 12 hours above the 400 level in the area of the program (in philosophy or in other departments).

Courses in philosophy

Undergraduate credit

PHILO 100. Introduction to Philosophical Problems.

(3) I, II, S. An introduction to some of the main problems of philosophy such as the nature of morality, knowledge, mind and body, political authority, and the existence of God. PHILO-100-0-1509

PHILO 105. Introduction to Critical Thinking. (3) I, II, S.

An introduction to the values of the Western intellectual tradition. Emphasizes the concepts of truth and reasoning and their application to science, ethics, and everyday life. Open only to freshmen and sophomores. PHILO-105-0-1509

PHILO 110. Introduction to Formal Logic. (3) I, II, S.

An elementary investigation of the concept of arguments introducing the basic symbolic techniques of contemporary logic. The presentation is at a more elementary level than that of Symbolic Logic I. PHILO-110-0-1509

PHILO 115. Introduction to Philosophy of Religion.

(3) I, II. Raises the philosophical problems of the meaning of religious language, the existence and nature of God, the distinction between reason and faith, between knowledge and belief, and between revelation and science. PHILO-115-0-1509

PHILO 120. Introduction to the Philosophy of Art and Literature. (3) I, II.

An introduction to philosophical problems concerning the concept of art, aesthetic value, and art appreciation and criticism. For students of art, architecture, literature, music, and theater. PHILO-120-0-1509

PHILO 125. Introduction to Philosophy of Science. (3) I, II, S.

Examines the nature of science and how it differs from pseudo-sciences such as astrology, and raises questions about the nature of reality and social value of science. PHILO-125-0-1509

PHILO 130. Introduction to Ethics. (3) I, II, S.

Examines philosophical issues arising in and about morality. Topics may include the nature of moral judgments, moral knowledge, moral justification, and the relation of morality to religion. Topics may be approached by a study of contemporary moral problems, by reading of classical philosophical texts, or by both methods. PHILO-130-0-1509

PHILO 135. Introduction to Social and Political Philosophy. (3) I, II, S. Examines the concepts of justice, the ideal society, and the relation between the state and the individual. Classical and contemporary views on civil disobedience, the enforcement of morals, punishment, and the relation between politics and economics are discussed. PHILO-135-0-1509

PHILO 140. Introduction to Philosophy of Mind. (3) I, II. Examines problems about the relation between mind and body, the existence of a "soul," the concepts of "insanity" and "the unconscious," parapsychology, and major schools of modern psychology such as behaviorism, Freudianism, and existentialist psychiatry. PHILO-140-0-1509

PHILO 145. Introduction to Philosophical Classics. (3) I, II. An introduction to philosophy through the careful reading of selected works of a major influence in the history of philosophy. PHILO-145-0-1509

PHILO 150. Introduction to the Philosophy of Feminism. (3) I, II. Philosophical issues pertaining to sexual equality, masculinity, femininity, and parenting, as well as contemporary topics such as pornography, prostitution, sexual harassment, and rape. PHILO-150-0-1509

PHILO 215. Honors Introduction to Philosophy. (3) I, II. An introduction to the main problems in philosophy. For students in the honors program. PHILO-215-0-1509

PHILO 220. Symbolic Logic I. (3) I, II. A systematic introduction to modern logic. Truth-functions, truth tables, and calculus of propositions, classes, and relations. PHILO-220-0-1509

PHILO 297. Honors Introduction to the Humanities I. (3) I. Study of selected major works of history, literature, and philosophy which have been of central importance in the Western cultural tradition. Considerable emphasis is placed on classroom discussion and writing interpretive essays. Limited to entering freshman students. Pr.: Consent of instructor. Same as ENGL 297, HIST 297, MLANG 297. PHIL-297-0-1509

PHILO 298. Honors Introduction to the Humanities II. (3) II. Continuation of PHILO 297. Pr.: PHILO 297 or consent of instructor. Same as ENGL 298, HIST 298, MLANG 298. PHILO-298-0-1509

PHILO 300. History of Ancient Philosophy. (3) I. The development of philosophical ideas in the West through the medieval period, with special emphasis on ancient Greek philosophy. PHILO-300-0-1509

PHILO 301. History of Modern Philosophy. (3) II. The development of philosophical ideas from the Renaissance to the nineteenth century. PHILO-301-0-1509

PHILO 397. Experimental Studies in Philosophy. (1-6) I, II. Experimental and interdisciplinary studies in philosophy. Topics selected in consultation with instructor. Pr.: Permission of instructor. PHILO-397-0-1509

PHILO 399. Honors Seminar in Philosophy. (3) I, 1979. PHILO-399-0-4900

PHILO 492. Computers and Society. (1-2) II. A study of ethical issues raised by the impact of computers and associated technologies on society, including such topics as ethics of computer use, computer fraud, protection of privacy; legal, moral, and public policy-making responsibilities of computer professionals. Pr.: Junior standing plus conc. enrollment in CIS 492; CIS 520. PHILO-492-0-1509

PHILO 499. Senior Honors Thesis. (2) I, II, S. Open only to honor students in the arts and sciences honors program. PHILO-499-4-1509

Undergraduate and graduate credit in minor field

PHILO 510. Symbolic Logic II. (3) On sufficient demand. An advanced study of logical systems and problems in logical theory. Pr.: PHILO 220 or 110. PHILO-510-0-1509

PHILO 515. Philosophy of Religion. (3) II, in alternate years. A course designed to examine philosophically the basic concepts of religion, e.g., truth and faith, God and atheism, reason and revelation, morality and religion, evil, man, sin, salvation, eschatology. Pr.: One course in philosophy or consent of instructor. PHILO-515-0-1509

PHILO 525. Social-Political Philosophy. (3) I or II. A combined systematic and historical examination of social and political philosophy from antiquity to the present. Pr.: One course in philosophy or consent of instructor. PHILO-525-0-1509

PHILO 535. Philosophy of Law. (3) I or II. A study of problems about the nature of legal reasoning, relationship between law and morality, and the justification of legal punishment. Pr.: One course in philosophy or junior standing. PHILO-535-0-1509

PHILO 545. Philosophy of Economics. (3) I, II. An examination of the moral and conceptual foundations of modern economic systems. Considers such topics as the relations between "economics rationality" and the quality of life, the just distribution of wealth, the nature of property rights, and the value of technology in society. Pr.: One course in philosophy or junior standing. PHILO-545-0-1509

PHILO 555. Ethical Theories. (3) I. A systematic survey of the major literature of moral philosophy, e.g., Plato, Aristotle, Hobbes, Hume, Kant, Mill, Moore, Prichard. Pr.: One course in philosophy. PHILO-555-0-1509

PHILO 565. Medical Ethics. (3) I, II. A detailed examination of selected moral issues which confront the medical professional and of the main points of the Hippocratic Oath. Topics frequently dealt with include: experimentation on human subjects, informed consent, abortion, euthanasia, conflict of interest, confidentiality of patients' records and conversations. Pr.: Junior standing. PHILO-565-0-1509

PHILO 575. Philosophy in Literature. (3) I or II. An examination of philosophical ideas encountered in selected writings of the world's great poets, novelists, essayists. Pr.: One course in philosophy and one in literature. PHILO-575-0-1509

PHILO 580. Existentialism. (3) I or II. A study of prominent thinkers in the existentialist tradition. Pr.: One course in philosophy or permission of instructor. PHILO-580-0-1509

PHILO 585. Engineering Ethics. (3) I or II. An examination of the principles of ethics as applied to cases arising in the practice of the various branches of engineering. Pr.: PHILO 130 or junior standing. PHILO-585-0-1509

PHILO 590. Business Ethics. (3) I or II. An examination of the principles of ethics as applied to situations and practices in modern American business. Pr.: PHILO 130 or junior standing. PHILO-590-0-1509

Undergraduate and graduate credit

PHILO 600. Studies in Ancient Philosophy. (3) I. A detailed study of a selected philosopher or movement in the history of Greek and Roman philosophy. Pr.: PHILO 300. PHILO-600-0-1509

PHILO 605. Studies in Seventeenth and Eighteenth Century Philosophy. (3) II. A detailed study of a selected philosopher, school, or problem drawn from the history of philosophy in the seventeenth and eighteenth centuries. Pr.: PHILO 301. PHILO-605-0-1509

PHILO 610. Recent European Philosophy. (3) I or II. An examination of important issues and movements in twentieth century European philosophy. Emphasis upon existentialism and phenomenology. Pr.: One course in philosophy. PHILO-610-0-1509

PHILO 620. The Development of Analytical Philosophy. (3) I or II. The history of analytical philosophy in the first four decades of the twentieth century. A study of the work of Moore, Russell, the early Wittgenstein, and the logical positivists. Pr.: One course in philosophy. PHILO-620-0-1509

PHILO 625. The Philosophy of Language. (3) I or II, in alternate years. Philosophical problems concerning the nature of language and such concepts as meaning and truth. Pr.: PHILO 110 or 220. PHILO-625-0-1509

PHILO 630. Recent British-American Philosophy. (3) I or II. A detailed study of selected philosophical writings of current interest in Great Britain and the United States. Pr.: One course in philosophy. PHILO-630-0-1509

PHILO 635. Metaphysics. (3) I or II, in alternate years. A critical examination of theories about things and their qualities, causality, space, and time. Both traditional and contemporary sources may be used, but emphasis will be placed on the latter. Pr.: One course in philosophy. PHILO-635-0-1509

PHILO 640. Epistemology. (3) I or II, in alternate years. An examination of philosophical problems about the nature of our knowledge of the world. Pr.: One course in philosophy. PHILO-640-0-1509

PHILO 645. The Philosophy of Science. (3) I or II, in alternate years. Philosophical problems concerning science, its methods, laws, and theories. Pr.: One course in philosophy. PHILO-645-0-1509

PHILO 650. Philosophy of the Social Sciences. (3) I or II, in alternate years. An examination of the possibility of a science of human beings and of specific issues in the social sciences such as models and measurement, reduction, functional analysis, ideal types, and axiomatization. For students in sociology, anthropology, political science, psychology, geography, and history. Pr.: One course in philosophy or consent of instructor. PHILO-650-0-1509

PHILO 655. The Philosophy of Mind. (3) I, in alternate years. The philosophy of psychology. An examination of philosophical problems about such psychological concepts as mind, consciousness, thinking, emotion, and dreaming. Pr.: One course in philosophy or consent of instructor. PHILO-655-0-1509

PHILO 660. Advanced Ethics. (3) I or II. Detailed examination of selected topics in contemporary ethical theory. Pr.: PHILO 555 or consent of instructor. PHILO-660-0-1509

PHILO 665. Philosophy of Feminism. (3) I or II. An in-depth analysis of important recent feminist contributions to social and political philosophy, epistemology, aesthetics, and ethics. Topics such as power, work, love, reproductive freedom, and education will be considered. Pr.: One course in philosophy. PHILO-665-0-1509

PHILO 670. Aesthetics. (3) On sufficient demand. A study of selected topics in aesthetics and the philosophy of art. Pr.: PHILO 120 or consent of instructor. PHILO-670-0-1509

PHILO 680. Problems in Philosophy. (Var.) I, II, S. Independent study for qualified students. Pr.: Background of courses required for problem undertaken. PHILO-680-3-1509

PHILO 701. Topics in Metalogic. (3) On sufficient demand. Selected topics in the analysis of first-order theories and the foundations of mathematics. Pr.: PHILO 510 or MATH 511. PHILO-701-0-1509

Physical Education and Leisure Studies

Larry Noble, Head

Professors McElroy* and Noble;* Associate Professors Johnson* and Laurie;* Assistant Professors Dzewaltowski, Hunter,* Kellstrom, Kraemer,* Layne, Rinehardt, Stevenson, and Satern; Instructors Boller, Christie, Coleman, and Sandrey; Emeriti: Professor Geyer; Associate Professors McKinney and Wauthier; Instructor Poole.

Students enrolling in the Department of Physical Education and Leisure Studies may earn a degree in physical education or leisure studies. Majors in physical education may select specializations such as human movement studies, exercise science, elementary physical education, secondary physical education, coaching, or athletic training.

Majors in leisure studies specialize in recreation and park management and/or therapeutic recreation.

Transfer students

Students transferring to Kansas State University and desiring to complete a major in the PELS department should send an up-to-date transcript to the coordinator of professional preparation, Department of Physical Education and Leisure Studies, Kansas State University, and to the College of Arts and Sciences. It will be evaluated before entrance to the University. If possible, transfer students should adhere to the following:

Check the general requirements of Kansas State University and of the college in which you intend to enroll. Try to complete as many of these requirements as possible before arrival. This is especially true of transfer students who are completing two years of junior college work prior to transfer.

Avoid taking major courses until transferring to Kansas State University if enrolled at a junior college. If there are other courses you desire to take at the institution from which you are transferring, check with the KSU Department of Physical Education and Leisure Studies for clearance prior to taking the courses.

Undergraduate study

Basic physical education requirement

All KSU freshmen enroll in one semester of the PE 101, Principles of Physical Fitness, to satisfy the physical education requirement. After completion of Principles of Physical Fitness, students are encouraged to enroll in a 1-credit-hour course (PE 104 through 193), where an opportunity will be given for gaining knowledge, skill, and

appreciation of lifetime recreational activities.

Physical education major

For a degree in physical education students should take the following:

General education requirements

See the general College of Arts and Sciences requirements for B.A. and B.S.

Physical education core

To be taken by all majors

| | | |
|--------|--|-----------|
| PE 206 | Professional Orientation | 1 |
| PE 320 | Motor Development and Learning | 3 |
| PE 325 | History and Philosophy of Physical Education | 3 |
| PE 330 | Kinesiology | 3 |
| PE 335 | Physiology of Exercise | 3 |
| PE 340 | Social-Psychological Dimensions of Physical Activity | 3 |
| PE 561 | Adapted Physical Education | 3 |
| PE 710 | Measurement and Evaluation in Physical Education | 3 |
| | | 22 |

Physical education specialization areas

To earn a major in physical education a student must complete one of the following in addition to the professional physical education core:

Human movement studies

Fifteen hours of physical education classes numbered 300 or above, plus enough elective hours to fulfill 120-hour University requirement.

Exercise science

| | | |
|-----------|---|---|
| PE 635 | Nutrition and Exercise | 3 |
| PE 755 | Adult Exercise Programs | 3 |
| PE 759 | Exercise Testing and Prescription | 3 |
| PE 376* | First Aid and CPR | 1 |
| CHM 110 | General Chemistry | 5 |
| BIOCH 120 | Introductory Organic and Biological Chemistry | 5 |

Six hours of physical education course work numbered 300 or above

For internship, a student must meet the following qualifications: have completed all of the physical education major courses; have an overall 2.2 GPA with a 2.5 GPA in the physical education major courses; pass a physical examination.

Elementary specialization

| | | |
|--------------------|---|--------------|
| PE 315 | Treatment of Athletic Injuries | 3 |
| PE 359 | Administration of Physical Education, Athletic, and Intramural Programs | 3 |
| PE 376* | First Aid and CPR | 1 |
| PE 410 | Gymnastics in Physical Education | 3 |
| PE 420 | Rhythms in Physical Education | 3 |
| PE 445 | Movement Exploration and Creative Dance for Children | 3 |
| PE 455 | Physical Education Activities for Elementary Schools | 3 |
| DANCE 120 | Modern Dance I | 1 |
| Skill competency** | | 0-6 |
| | | 20-26 |

Secondary specialization

| | | |
|--------------------|---|--------------|
| PE 315 | Treatment of Athletic Injuries | 3 |
| PE 359 | Administration of Physical Education, Athletic, and Intramural Programs | 3 |
| PE 376* | First Aid and CPR | 1 |
| PE 410 | Gymnastics in Physical Education | 3 |
| PE 415 | Team Sports for Secondary Schools | 3 |
| PE 420 | Rhythms in Physical Education | 3 |
| PE 425 | Individual and Dual Sports for Secondary Schools | 3 |
| DANCE 120 | Modern Dance I | 1 |
| Skill competency** | | 0-6 |
| | | 20-26 |

K-12 specialization

| | | |
|--------------------|---|--------------|
| PE 315 | Treatment of Athletic Injuries | 3 |
| PE 359 | Administration of Physical Education, Athletic, and Intramural Programs | 3 |
| PE 376* | First Aid and CPR | 1 |
| PE 410 | Gymnastics in Physical Education | 3 |
| PE 415 | Team Sports for Secondary Schools | 3 |
| PE 425 | Individual and Dual Sports for Secondary Schools | 3 |
| PE 420 | Rhythms in Physical Education | 3 |
| PE 445 | Movement Exploration and Creative Dance for Children | 3 |
| PE 455 | Physical Education Activities for Elementary Schools | 3 |
| DANCE 120 | Modern Dance I | 1 |
| Skill competency** | | 0-6 |
| | | 26-32 |

*Or minimum of current first aid and CPR certification at time of petition.

**Competency must be demonstrated in two activities in Category A and four activities in Category B by: satisfactory completion of the lifetime sport class if available, satisfactory completion of the appropriate coaching class, or intercollegiate playing experience. Category A: Team sports and aquatics—basketball, football/baseball/softball, soccer, volleyball, and aquatics (WSI or current WSI certification). Category B: Individual sports and fitness—archery, badminton, golf, racquetball/handball, tennis, wrestling, gymnastics and apparatus, weight training, tumbling and floor exercise, bowling, track and field, aerobic dance and exercise, trap shooting, and backpacking.

Nutrition and exercise sciences

dual-degree program

B.S. in foods and nutrition

B.S. as physical education major with exercise science specialization

A 150-credit-hour dual-degree program

General education requirements

See the general College of Arts and Sciences requirements for B.S. degrees.

Physical education core

Exercise science

| | | |
|-----------|---|---|
| PE 376* | First Aid—Standard and CPR | 1 |
| PE 635 | Nutrition and Exercise | 3 |
| PE 755 | Adult Exercise Programs | 3 |
| PE 759 | Exercise Testing and Prescription | 3 |
| BIOL 555 | Microbiology | 5 |
| CHM 110 | General Chemistry | 5 |
| CHM 190 | Elementary Organic Chemistry | 3 |
| CHM 191 | Elementary Organic Chemistry Laboratory | 2 |
| BIOCH 201 | Elementary Biochemistry | 3 |

Nutrition science

| | | |
|----------|---|---|
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 301 | Trends in Food Products | 3 |
| FN 352 | Concepts of Personal Health | 3 |
| DRIM 440 | Fundamentals of Quantity Food Production | 5 |
| FN 501 | Food Science | 3 |
| FN 502 | Principles of Nutrition | 3 |
| FN 610 | Nutrition Needs Throughout the Life Cycle | 3 |
| FN 680 | Seminar in Foods and Nutrition | 2 |
| FN 700 | Community Nutrition | 3 |
| FN 706 | Practicum in Community Nutrition | 3 |
| FN 712 | Diet Therapy | 3 |

*Or minimum of current standard first aid and CPR certification at time of petition.

Professional education requirements

For a degree in physical education with a specialization in either secondary or K-12, students should take the following:

General requirements

See the general College of Arts and Sciences requirements.

College of Education

Professional education requirements for those certifying to teach (secondary and K-12).

Pre-professional education

Required for admission to teacher education and prerequisite for Block I

| | | |
|----------|--|---|
| DEDA 102 | Teaching as a Career | 1 |
| EDAF 215 | Educational Implications of Growth and Development | 3 |

Fifty hours of course work

An overall GPA of 2.5

A grade of C or better in ENGL 100 and 120, and SPCH 106

A 2.5 GPA in PELS courses

Pre-professional skills test

Block I (Admission to teacher education required—courses must be taken concurrently and are a prerequisite for Block II)

| | | |
|----------|---|---|
| EDAF 315 | Educational Psychology | 3 |
| EDAF 323 | Exceptional Student in the Secondary School | 2 |
| EDCI 376 | Core Teaching Skills and Lab | 3 |

Block II (Courses must be taken concurrently and are a prerequisite to Block III.)

| | | |
|----------|--|---|
| EDCI 476 | Content Area Methods in the Secondary School | 2 |
| EDCI 477 | Middle Level/Secondary Reading | 2 |
| EDCI 420 | Content and Reading Methods Lab | 1 |

Block III (Courses must be taken concurrently)

| | | |
|----------|--|----|
| EDCI 455 | Teaching in a Multicultural Society | 1 |
| EDAF 525 | Interpersonal Relations in the School | 1 |
| EDCI 586 | Teaching Participation in Secondary School | 12 |

Non-blocked courses (These courses may be taken at any time after admission to teacher education and prior to student teaching.)

| | | |
|----------|---|-----------|
| EDAF 410 | Foundations of Education | 3 |
| EDCI 318 | Instructional Media and Tech | 2 |
| EDCI 469 | Physical Education in Elementary Schools (if K-12 specialist) | 3 |
| | | 39 |

*Note: Application for Professional Semester (Block III) must be filed by Dec. 20 of the year preceding enrollment in the Professional Semester.

The following natural science and social science courses should be taken by physical education majors:

| | | |
|-----------|--|---|
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Structure and Function of the Human Body | 6 |
| PHYS 115 | Descriptive Physics | 4 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |

Leisure studies major

For a degree in leisure studies students should take the following:

General education requirements

See general College of Arts and Sciences requirements for B.A. and B.S.

Leisure studies core

| | | |
|---------|------------------------------------|-----------|
| CIS 110 | Introduction to Personal Computing | 3 |
| LS 210 | Leisure in Society | 3 |
| LS 320 | Recreation Leadership | 3 |
| LS 481 | Participation in Recreation | 2 |
| LS 487 | Recreation Facility Management | 3 |
| LS 488 | Recreation for Special Populations | 3 |
| LS 489 | Recreation Program | 3 |
| LS 490 | Recreation Administration I | 3 |
| LS 491 | Seminar in Recreation | 2 |
| LS 520 | Leisure Studies Research Methods | 3 |
| | | 28 |

*Current American Red Cross first aid/CPR certifications are required for the pre-internship and internship.

Leisure studies specialization

Select and complete A and/or B.

A. Recreation and park management—16 hours

This option is designed for the person who will be conducting and operating a recreation/park program in a variety of leisure settings.

| | | |
|-----------|-------------------------------------|-----------|
| Required: | | |
| LS 725 | Recreation Administration II | 3 |
| LAR 756 | Design of Recreation and Park Areas | 3 |
| FOR 590 | Park Operations | 4 |
| JMC 512 | Public Relations | 3 |
| PSYCH 545 | Consumer Psychology | 3 |
| or | | |
| MKTG 400 | Marketing | 3 |
| or | | |
| PSYCH 560 | Industrial Psychology | 3 |
| or | | |
| MGMT 420 | Management Concepts | 3 |
| | | 16 |

B. Therapeutic recreation—18 hours

| | | |
|-------------------------------|---|---|
| Required: | | |
| LS 493 | Therapeutic Recreation Service | 3 |
| LS 501 | Therapeutic Recreation in Rehabilitation Agencies | 3 |
| Six hours from the following: | | |
| PSYCH 505 | Abnormal Psychology | 3 |
| EDAF 622 | Psychology of Exceptional Children | 3 |
| EDAF 663 | Education of Exceptional Children | 3 |
| EDAF 664 | Mental Retardation | 3 |
| SOCIO 560 | Juvenile Delinquency | 3 |
| SOCIO 561 | Criminology | 3 |
| SOCIO 744 | Social Gerontology: An Introduction to the Sociology of Aging | 3 |
| PSYCH 715 | Psychology of Aging | 3 |
| EDAF 628 | Characteristics of the Emotionally Disturbed | 3 |
| EDAF 721 | Mental Hygiene in School and Community | 3 |
| EDAF 755 | Guidance of the Exceptional Individual | 3 |

Six hours from Group I or II as listed on the leisure studies major approved course list.

Directed field experience

A. Recreation and park management

| | | |
|--------|--|----|
| LS 492 | Internship in Leisure Service Agencies | 15 |
|--------|--|----|

Internship is a one-semester, minimum 15-week, 600-hour experience in an approved recreation/leisure service agency.

B. Therapeutic recreation

| | | |
|--------|---|----|
| LS 494 | Internship in Therapeutic Recreation Agencies | 15 |
|--------|---|----|

Intensive practical experience over a 15-week, 600-hour period in an approved therapeutic recreation site.

Students must meet the following qualifications: 2.2 GPA in all course work attempted at KSU, 2.5 GPA in all leisure studies major core courses; leisure studies majors must have satisfactory pre-internship experiences

in leisure/recreation field, minimum of 280 hours during college/university preparation.

Departmental options

Coaching certification program

This program prepares coaches in all areas of varsity athletics, and is open to nonmajors as well as students majoring in physical education and leisure studies. Students completing the following courses will receive an athletic coaching endorsement from the Department of Physical Education and Leisure Studies. Majors taking this program must also complete all requirements for a major in either physical education or leisure studies. The coaching program is not a substitute for specialization requirements. Nonmajors are not required to take any work in the department in addition to the coaching program.

Coaching program requirements

Physical education majors

| | | |
|--------|---|---|
| PE 315 | Treatment of Athletic Injuries | 3 |
| PE 320 | Motor Development and Learning | 3 |
| PE 330 | Kinesiology | 3 |
| PE 335 | Physiology of Exercise | 3 |
| PE 586 | Supervised Practicum for Athletic Coaches | 2 |

One of the following:

| | | |
|--------|--|---|
| PE 298 | Coaching and Officiating Wrestling | 2 |
| PE 299 | Coaching and Officiating Swimming | 2 |
| PE 300 | Coaching and Officiating Volleyball | 2 |
| PE 301 | Coaching and Officiating Gymnastics | 2 |
| PE 302 | Coaching and Officiating Basketball | 2 |
| PE 303 | Coaching and Officiating Baseball | 2 |
| PE 304 | Coaching and Officiating Track and Field | 2 |
| PE 305 | Coaching and Officiating Football | 2 |
| PE 309 | Coaching and Officiating Tennis and Golf | 2 |

Non-physical education majors

| | | |
|--------|---|---|
| PE 315 | Treatment of Athletic Injuries | 3 |
| PE 250 | Scientific Foundations of Coaching | 3 |
| PE 586 | Supervised Practicum for Athletic Coaches | 2 |

One of the following:

| | | |
|--------|--|---|
| PE 298 | Coaching and Officiating Wrestling | 2 |
| PE 299 | Coaching and Officiating Swimming | 2 |
| PE 300 | Coaching and Officiating Volleyball | 2 |
| PE 301 | Coaching and Officiating Gymnastics | 2 |
| PE 302 | Coaching and Officiating Basketball | 2 |
| PE 303 | Coaching and Officiating Baseball | 2 |
| PE 304 | Coaching and Officiating Track and Field | 2 |
| PE 305 | Coaching and Officiating Football | 2 |
| PE 309 | Coaching and Officiating Tennis and Golf | 2 |

Athletic training option

This program prepares athletic trainers for all levels: clinical, college, industrial, and professional. It is especially applicable to teacher preparation students desiring to serve as junior or senior high school athletic

trainers. Physical education majors accepted into the program must also complete the P.E. core and a selected specialization area. Non-physical education majors accepted in the program only take the required courses in the athletic training program. Please note that athletic training is *not* a major course of study.

For physical education majors (any specialization)

| | | |
|----------|--|-------|
| FN 132 | Basic Nutrition | 3 |
| PE 315 | Treatment of Athletic Injuries | 3 |
| PE 550 | Rehabilitation and Conditioning | 3 |
| PE 551 | Evaluation and Emergency Management | 3 |
| PE 555 | Therapeutic Modalities in Athletic Training | 3 |
| PE 557 | Administration of Athletic Training Programs | 3 |
| PE 585 | Internship in Athletic Training (Minimum of 1 credit hour each semester for four semesters. This is taken during the junior and senior years.) | 4 |
| FN 352 | Concepts of Personal Health | 3 |
| EDCI 318 | Instructional Media | 2 |
| | | <hr/> |
| | | 27 |

800 hours supervised clinical experience

For non-physical education majors (Can be combined with any major)

| | | |
|----------|--|-------|
| BIOL 240 | Human Body | 6 |
| FN 132 | Basic Nutrition | 3 |
| FN 352 | Concepts of Personal Health | 3 |
| EDCI 318 | Instructional Media | 2 |
| PE 330 | Kinesiology | 3 |
| PE 335 | Exercise Physiology | 3 |
| PE 340 | Social and Psychological Dimension of Physical Activity | 3 |
| PE 376 | Standard First Aid, Community CPR, and CPR | 1 |
| PE 315 | Treatment of Athletic Injuries | 3 |
| PE 550 | Rehabilitation and Conditioning for Athletic Injuries | 3 |
| PE 551 | Evaluation and Emergency Management of Athletic Injuries | 3 |
| PE 555 | Therapeutic Modalities in Athletic Training | 3 |
| PE 557 | Administration of Athletic Training Programs | 3 |
| PE 585 | Internship in Athletic Training (Minimum of 1 credit hour each semester for four semesters. This is taken during junior and senior years.) | 4 |
| | | <hr/> |
| | | 43 |

800 hours supervised clinical experience

Adapted physical education certification

The Department of Physical Education and Leisure Studies in cooperation with the College of Education offers a State Department of Education approved certification program in adapted physical education. Each applicant for an adapted physical education endorsement shall have successfully completed a state approved adapted physical education program and meet state requirements to receive a teacher certification degree in physical education. Following are the required courses for certification in adapted P.E.

| | | |
|----------|--|-------|
| PE 561 | Adapted Physical Education | 3 |
| PE 599 | Independent Study (Adaptive) | 3 |
| EDAF 623 | Exceptional Child in Regular Classroom | 3 |
| PE 735 | Physical Education for the Atypical | 3 |
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Graduate study

The Department of Physical Education and Leisure Studies offers a master of science in physical education.

Master of science

The M.S. degree in physical education assists students in developing professional and research skills in a variety of areas. In working toward the degree, students have the opportunity to study with faculty possessing specialized expertise in many scientific foundations and program and administration areas. Examples of courses and areas of study include: exercise physiology, biomechanics, motor behavior, sports administration, sport and exercise psychology, sport sociology, and sport history.

Students may choose from three different degree plans (30 hours each) depending on their individual needs and interests: thesis; master's report; or course work. The student and the supervisory committee are responsible for developing the student's curriculum. Individual programs are designed to meet the unique needs of each student. Up to 12 hours related to the student's area of emphasis may be taken outside the department.

The program is outlined below:

Research core

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| PE 815 | Research Methods in Physical Education | 3 |
| STAT 702 | Statistical Methods for Social Sciences | 3 |
| | or | |
| STAT 703 | Statistical Methods for Natural Sciences | 3 |

Subject core

Two of the following courses required for thesis option:
Three of the following courses required for coursework or report option:

| | | |
|--------|---|---|
| PE 700 | Principles and Philosophy of Physical Education | 3 |
| PE 800 | Advanced Physiology of Exercise | 3 |
| PE 805 | Sport and Human Behavior | 3 |
| PE 806 | Motor Development | 3 |
| PE 807 | Motor Learning and Control | 3 |
| PE 825 | Mechanical Analysis of Human Movement | 3 |
| PE 808 | Advanced Issues in Sport Sociology | 3 |

Support courses

Taken from physical education or related area to be decided upon by the student and supervisory committee.

Further details about programs and possible financial assistance may be obtained by writing to the department.

Physical education

Undergraduate credit

- PE 100. Adaptive Physical Education.** (1) I, II. Exercise programs adapted to the needs of the special student. May be repeated eight times. PE-100-5-0835
- PE 101. Principles of Physical Fitness.** (1) I, II, S. Physical fitness principles that contribute to overall health. Fitness self-assessment, program design principles appropriate for the development and maintenance of optimal fitness levels, and activities appropriate for the reduction of risks associated with coronary heart disease and obesity are emphasized. PE-101-1-5-0835

Lifetime sports

Aquatics

- PE 104. Swimming I.** (1) Beginning instruction for students who have no previous experience with swimming. PE-104-5-0835
- PE 105. Swimming II.** (1) For the beginning swimmer who has had some previous swimming experience. PE-105-5-0835
- PE 106. Swimming III.** (1) Pr.: PE 105 or consent of instructor. PE-106-5-0835
- PE 107. Fitness Swimming.** (1) Pr.: PE 106 or consent of instructor. PE-107-5-0835
- PE 110. Scuba Diving.** (1) PE-110-5-0835
- PE 111. Diving.** (1) PE-111-5-0835
- PE 112. Synchronized Swimming.** (1) PE-112-5-0835
- PE 113. Water Polo.** (1) PE-113-5-0835

Team sports

- PE 120. Basketball.** (1) PE-120-5-0835
- PE 121. Field Hockey.** (1) PE-121-5-0835
- PE 122. Flag Football.** (1) PE-122-5-0835
- PE 123. Soccer.** (1) PE-123-5-0835
- PE 124. Softball.** (1) PE-124-5-0835
- PE 125. Team Handball.** (1) PE-125-5-0835
- PE 126. Volleyball I.** (1) PE-126-5-0835
- PE 127. Volleyball II.** (1) Pr.: PE 126 or consent of instructor. PE-127-5-0835

Individual and dual sports

- PE 135. Archery.** (1) PE-135-5-0835
- PE 136. Badminton.** (1) PE-136-5-0835
- PE 138. Bowling.** (1) PE-138-5-0835
- PE 139. Fencing.** (1) PE-139-5-0835
- PE 140. Golf.** (1) PE-140-5-0835
- PE 141. Gymnastics and Apparatus I.** (1) PE-141-5-0835
- PE 142. Gymnastics and Apparatus II.** (1) Pr.: PE 141 or consent of instructor. PE-142-5-0835
- PE 143. Handball.** (1) PE-143-5-0835
- PE 144. Judo I.** (1) PE-144-5-0835
- PE 145. Judo II.** (1) Pr.: PE 144 or consent of instructor. PE-145-5-0835
- PE 146. Karate I.** (1) PE-146-5-0835
- PE 147. Karate II.** (1) Pr.: PE 146 or consent of instructor. PE-147-5-0835
- PE 148. Racquetball.** (1) PE-148-5-0835
- PE 149. Riflery.** (1) PE-149-5-0835

- PE 150. Self Defense.** (1) Instruction in selected self-defense techniques derived from judo, karate, and other martial arts. PE-150-5-0835
- PE 151. Tennis I.** (1) PE-151-5-0835
- PE 152. Tennis II.** (1) Pr.: PE 151 or consent of instructor. PE-152-5-0835
- PE 153. Track and Field.** (1) PE-153-5-0835
- PE 154. Tumbling and Floor Exercise.** (1) PE-154-5-0835
- PE 155. Wrestling.** (1) PE-155-5-0835

Training and conditioning activities

- PE 160. Aerobic Dancing and Exercise.** (1) PE-160-5-0835
- PE 161. Fitness and Conditioning.** (1) PE-161-5-0835
- PE 162. Jogging.** (1) PE-162-5-0835
- PE 163. Weight Training.** (1) PE-163-5-0835

Indoor and outdoor recreational games and sports

- PE 170. **Angling.** (1) PE-170-5-0835
- PE 171. **Backpacking and Hiking.** (1) PE-171-5-0835
- PE 172. **Bicycle Touring.** (1) PE-172-5-0835
- PE 173. **Billiards and Snooker.** (1) PE-173-5-0835
- PE 174. **Bow Hunting.** (1) PE-174-5-0835
- PE 175. **Camping.** (1) PE-175-5-0835
- PE 176. **Canoeing I.** (1) Pr.: PE 105 or equiv. PE-176-5-0835
- PE 177. **Canoeing II.** (1) Pr.: PE 176 or consent of instructor. PE-177-5-0835
- PE 178. **Crew.** (1) PE-178-5-0835
- PE 179. **Cross Country Skiing.** (1) PE-179-5-0835
- PE 180. **Downhill Skiing.** (1) PE-180-5-0835
- PE 181. **English Horsemanship I.** (1) PE-181-5-0835
- PE 182. **English Horsemanship II.** (1) Pr.: PE 181 or consent of instructor. PE-182-5-0835
- PE 183. **Western Horsemanship I.** (1) PE-183-5-0835
- PE 184. **Western Horsemanship II.** (1) Pr.: PE 183 or consent of instructor. PE-184-5-0835
- PE 185. **Orienteering.** (1) PE-185-5-0835
- PE 186. **Recreational Games.** (1) PE-186-5-0835
- PE 187. **Roller Skating.** (1) PE-187-5-0835
- PE 188. **Sailing I.** (1) Pr.: PE 105 or equiv. PE-188-5-0835
- PE 189. **Sailing II.** (1) Pr.: PE 188 or consent of instructor. PE-189-5-0835
- PE 190. **Table Tennis.** (1) PE-190-5-0835
- PE 191. **Trap Shooting.** (1) PE-191-5-0835
- PE 192. **Water Skiing.** (1) Pr.: PE 105 or equiv. PE-192-5-0835
- PE 193. **Wind Surfing.** (1) Pr.: PE 105 or equiv. PE-193-5-0835
- PE 194. **Equestrian Driving I.** (1) Beginning instruction in the basic driving skills of a single light horse or pony to a two-wheel cart. PE-194-5-0835
- PE 195. **Equestrian Driving II.** (1) I, II. Advanced instruction in the driving skills of a single light horse or pony to a two-wheel cart. Pr.: PE 194. PE-195-5-0835
- PE 196. **Equestrian Vaulting I.** (1) I, II. Beginning instruction on the sport of horse vaulting. PE-196-5-0835
- PE 197. **Equestrian Vaulting II.** (1) I, II. Instruction on the sport of competitive horse vaulting. Pr.: PE-197-5-0835

The following courses may be taken by students majoring in physical education or other students meeting prerequisite requirements.

- PE 200. **Concepts of Adult Physical Fitness.** (2) A study of the facts about the effects of regular exercise on physical fitness and health. PE-200-0-0835
- PE 204. **Emergency Water Safety.** (1) I, II. This course will serve as a sound foundation for further training in lifeguarding and aquatics. It will not qualify a participant to be a lifeguard. Pr.: PE 106 or consent of instructor. PE-108-5-0835
- PE 205. **The Sporting Mind: Maximizing Performance.** (2) I. An introduction to the theory and application of cognitive skills and strategies for both athletes and coaches. Pr.: PSYCH 110. PE-205-0-0835
- PE 206. **Professional Orientation.** (1) I. Orientation to the field of physical education; the University; and the department. PE-206-0-0835

- PE 250. **Scientific Principles of Coaching.** (3) II. Physiological, psychological, and kinesiological principles of coaching. Topics include training and conditioning, motivation, psychological factors affecting sport skill in performance, and mechanical principles underlying sport performance. Not for PE majors. PE-250-0-0835
- PE 298. **Coaching and Officiating Wrestling.** (2) On sufficient demand. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-298-1-2-0835
- PE 299. **Coaching and Officiating Swimming.** (2) II, in even years. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-299-2-0835
- PE 300. **Coaching and Officiating Volleyball.** (2) I. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-300-2-0835
- PE 301. **Coaching and Judging Gymnastics.** (2) On demand. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-301-2-0835
- PE 302. **Coaching and Officiating Basketball.** (2) II. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-302-2-0835
- PE 303. **Coaching and Umpiring Baseball.** (2) I, in even years. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-303-2-0835
- PE 304. **Coaching and Officiating Track and Field.** (2) II, in odd years. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-304-2-0835
- PE 305. **Coaching and Officiating Football.** (2) I. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-305-2-0835
- PE 309. **Coaching and Officiating Tennis and Golf.** (2) I, in odd years. Study of rules, theory, and practices; methods of coaching. Pr.: PE 250. PE-309-2-0835
- PE 310. **Lifeguard Training.** (2) I, II. The purpose of this course is to provide the necessary minimum skills training for a person to qualify to serve as a pool lifeguard. This course allows time for skills refinement and fitness swimming. Pr.: PE 106 or equivalent skills. PE-311-5-0835
- PE 311. **Lifeguard Training.** (2) Intersession. The purpose of this course is to provide the necessary minimum skills training for a person to qualify to serve as a pool lifeguard. Pr.: PE 106 or equivalent skills. PE-311-5-0835
- PE 315. **Treatment of Athletic Injuries.** (3) I, II. Principles and practices of treatment, taping, and care of minor athletic injuries. Pr.: PE 250 or BIOL 240 or conc. enrollment in BIOL 240. PE-315-0-0835
- PE 320. **Motor Development and Learning.** (3) I, II. Motor behavior theories, motor development, neurological and psychological basis of motor behavior, motor and skill learning, the state of the performer and the application of instructional techniques. Two hours lec. and two hours lab a week. Pr.: PSYCH 110. PE-320-0-0835
- PE 325. **History and Philosophy of Physical Education.** (3) I, II. Historical and philosophical foundations of physical education and the principles of physical education. Pr.: PE 206. PE-325-0-0835
- PE 330. **Kinesiology.** (3) I, II. Mechanical and anatomical aspects of overt human movement. Kinematic and kinetic principles applied to the analysis of human movement. Two hours lec. and two hours lab a week. Pr.: BIOL 240 and PHYS 115. PE-330-0-0835
- PE 335. **Physiology of Exercise.** (3) I, II. The responses of the human body to exercise, emphasizing generation of energy in skeletal muscle, dynamics of muscular contraction, oxygen transport system, body composition, and training regimens. Two hours lec. and two hours lab a week. Pr.: BIOL 240. PE-335-0-0835

PE 340. **Social and Psychological Dimensions of Physical Activity.** (3) I, II. Theories and research on the social and psychological significance of physical activity including implications for physical education and athletic programs. Pr.: SOCIO 211 and PSYCH 110. PE-340-0-0835

PE 359. **Administration of Physical Education, Athletic, and Intramural Programs.** (3) I. Study of problems associated with the conduct of activity programs. Specifically considered are selection and care of equipment and facilities, public relations, legal liability, and scheduling. Pr.: Junior standing. PE-359-0-0835

PE 360. **Water Safety Instructor.** (3) I, II. An overview of the American Red Cross and basic teaching and learning concepts. Methods of teaching swimming and water safety. This course allows time for skills refinement and additional teaching experiences. Students earning an A or B in the course are eligible for Water Safety Instructor and Introduction to Health Services certifications from the American Red Cross. Pr.: PE 204, PE 310, or PE 311. PE-360-5-0835

PE 361. **Topics in Water Safety Instruction.** (3) Intersession. An overview of the American Red Cross and basic teaching concepts. Methods of teaching swimming and water safety. Students earning an A or B in this course are eligible for Water Safety Instructor and Introduction to Health Services Education certification from the American Red Cross. Pr.: PE 204, 310, or 311. PE 117-5-0835

PE 365. **Lifeguard Instructor.** (2) The purpose of this course is to train candidates to teach the American Red Cross Basic Water Safety, Emergency Water Safety, Lifeguard Training, and Lifeguard Training Review courses. Pr.: PE 310 or 311. PE-365-5-0835

PE 375. **Standard First Aid and Community CPR.** (1) I, II. Provides fundamental principles and skills in first aid. The course includes filmed demonstrations, instructor-led practice sessions, and programmed workbooks. CPR training teaches correct techniques for both adult and infant victims of cardiac arrest. American Red Cross certification on successful completion of course. Students cannot receive credit for both PE 375 and 376. PE-375-1-0835

PE 376. **Standard First Aid, Community CPR and CPR: Basic Life Support.** (1) I, II. Provides fundamental principles and skills in first aid. The course includes filmed demonstrations, instructor-led practice sessions, and programmed workbooks. CPR training teaches techniques for adult and infant victims of cardiac arrest. BLS teaches two-rescuer CPR, modified jaw thrust, and use of a pocket face mask. Students in pre-physical therapy, leisure studies, and exercise science must enroll in this course. Students cannot receive credit for both PE 375 and 376. PE-376-1-0835

PE 377. **Standard First Aid and Community CPR Instructor.** (1) On sufficient demand. Methods for teaching Standard First Aid and Community CPR courses. American Red Cross certifications on successful completion of the course. Pr.: Current certificates in ARC Standard First Aid and Community CPR. (PE 375 or 376). PE-375-1-0835

PE 379. **Physical Education for the Elementary School Teacher.** (3) Materials, techniques, and programs in physical education suitable for the different ages in the elementary school. Two hours rec. and two hours lab a week. Pr.: Sophomore standing and DED 202 or consent of instructor. Not open to majors in physical education and leisure studies. PE-379-7-0835

PE 399. **Sophomore Honors Seminar.** (1-3) I. Selected topics in physical education, dance, and leisure studies. Open to nonmajors in the honors program. PE-399-4-4900

PE 405. **Choreographing Aerobic Dance and Exercise Routines.** (2) II. A study of choreography and methodology in teaching aerobic dance and exercise routines in various educational settings. Emphasis upon preparation and progression of routines. Selecting music, designing routines, and methods of presenting to various age groups. Pr.: PE 330 and PE 335. PE-405-2-0835

PE 410. Gymnastics in Physical Education. (3) I. Application of scientific principles to the teaching of gymnastics. Emphasis upon skill technique and spotting procedures for grades K–12. Pr.: PE 320, 330, and 335 (or any two and conc. enrollment in the third). PE-410-0-2-0835

PE 415. Team Sports for Secondary Schools. (3) II. Application of scientific principles to the teaching of team sports. Emphasis upon sports selected from the following list: basketball, field hockey, flag football, soccer, softball, speedway, speedball, team handball, and volleyball. One hour lec. and four hours lab a week. Pr.: PE 320, 330, and 335 (or any two and conc. enrollment in the third). PE-415-1-2-0835

PE 420. Rhythms in Physical Education. (3) II. Application of scientific principles to the teaching of rhythmical skills. Emphasis on methods of teaching creative, folk, square, and social dance in grades K–12. Pr.: PE 320, 330, and 335 (or any two and conc. enrollment in the third). PE-420-1-2-0835

PE 425. Individual and Dual Sports for Secondary Schools. (3) I. Application of scientific principles to the teaching of individual and dual sports. Emphasis upon sports selected from the following lists: archery, badminton, bowling, fencing, golf, handball, racquetball, tennis, and wrestling. One hour lec. and four hours lab a week. Pr.: PE 320, 330, and 335 (or any two and conc. enrollment in the third). PE-425-1-2-0835

PE 430. Practicum Physical Education. (2) I, II. Supervised students assist in lifetime sports classes. Four hours lab a week. Pr.: Junior standing. PE-430-1-2-0835

PE 435. Sport and Contemporary Society. (3) II. An analysis of sport and its role in contemporary society. Course creates a greater awareness of the social significance of sport in society and fosters the capacity to use critical thinking in the analysis of significant sport issues. Same as SOCIO 435. Pr.: SOCIO 211. PE-435-0-0835

PE 445. Movement Exploration and Creative Dance for Children. (3) I. Application of scientific principles to the teaching of basic movement concepts and creative dance for grades K–6. Emphasis upon a guided discovery and problem-solving approach. One hour lec. and four hours lab a week. Pr.: PE 320, 330, and 335 (or any two and conc. enrollment in the third). PE-445-1-2-0835

PE 455. Physical Education Activities for Elementary Schools. (3) II. Application of scientific principles to the teaching of physical education for grades K–6, emphasizing fundamental motor skills, games of low and high organization, lead-up games, self-testing activities, warm-up activities, physical fitness testing, and classroom games. One hour lec. and four hours lab a week. Pr.: PE 320, 330, and 335 (or any two and conc. enrollment in the third). PE-455-1-2-0835

PE 461. Observation in Physical Education. (2) I, II. Observation of students engaged in school or community physical activity programs. Emphasis upon developmental assessment, interaction with students, and limited planning and organization of appropriate physical education activities. Two hours lab a week and one hour rec. Pr.: Junior standing and one or more physical education methods courses. PE-461-5-0835

PE 463. Laboratory Practicum in Physical Education. (1–2) I, II, S. Supervised students assist in laboratory. Four hours lab a week. Pr.: Junior standing and appropriate background for problem undertaken. PE-463-2-0835

PE 498. Honors Tutorial in Physical Education. (1–3) I, II. Individually directed research in physical education, normally as a preliminary to writing a senior honors thesis. May be repeated once to a total of three hours. Pr.: Sophomore standing, membership in the honors program of the College of Arts and Sciences, and permission of instructor. PE-498-4-0835

Undergraduate and graduate credit in minor field

PE 515. History of Sport. (3) The historical development of sport (especially in Europe and North America) including the growth of competition, the rise of mass spectator sports, elitism, and the changing function of sport. History of sport as business and history of the relationship between sport and other institutions. See HIST 515. PE-515-0-2205

PE 550. Rehabilitation and Conditioning for Athletic Injuries. (3) II. A study of applied rehabilitation and conditioning techniques used by athletic trainers. Pr.: PE 315, 330. PE-550-0-0835

PE 551. Evaluation and Emergency Management of Athletic Injuries. (3) I. An in-depth study of evaluation techniques for athletic injuries by the athletic trainer. Pr.: PE 315 and BIOL 240. PE-551-0-0835

PE 555. Therapeutic Modalities in Athletic Training. (3) II. The theory and application of the various energy systems used in the treatment of athletic injuries. Practical experiences will be emphasized. Pr.: PE 315, PHYS 115. PE-555-0-0835

PE 557. Administration of Athletic Training Programs. (3) I. Application of various problems and issues affecting the athletic trainers in their roles as administrators in the areas of role delineation, budget designs, legal aspects of sport, facility design, and drug testing/drug education. PE-557-0-0835

PE 561. Adapted Physical Education. (3) I, II. Developmental, remedial, and corrective physical education, emphasizing adaptations designed around scientific principles to meet the needs of individuals requiring special attention. Pr.: PE 330. PE-561-0-0835

PE 585. Internship in Athletic Training. (1–4) I, II. Supervised clinical application of practical skills in athletic training. Pr.: PE 315. May be repeated for a total of 4 credit hours with additional prerequisite of PE 330 and PE 335 required for last four semesters. PE-585-2-0835

PE 586. Supervised Practicum for Athletic Coaches. (2) I, II. Observation and coaching participation under the direction of selected coaches in public school, club, city recreation, or other nonpublic school sport settings. Pr.: PE 250, 315, and one coaching and officiating course. PE-586-2-0835

PE 598. Topics in Physical Education. (1–3) PE-598-3-0835

PE 599. Independent Studies in Physical Education. (1–3) Selected topics in physical education. Maximum of 3 hours applicable toward a degree. Pr.: Consent of department head. PE-599-3-0835

PE 635. Nutrition and Exercise. (3) II. The interrelationships between diet, nutrition, and exercise. Topics covered include physical fitness, weight control, nutrient metabolism during exercise, and athletic performance. Pr.: PE 335 and FN 132 or FN 502. Cross-listed with foods and nutrition; see FN 635. PE-635-0-0835

Undergraduate and graduate credit

PE 700. Principles and Philosophy of Physical Education. (3) II. Study of historical and philosophical foundations of physical education and an analysis of the principles of physical education. PE-700-0-0835

PE 702. PELS Workshop. (1–3) I, II, S. Intensified study of new and innovative techniques used in physical education, and leisure studies. Practical considerations of skill development, learning, and techniques of selected activities. May be counted for degree credit no more than once by any student. Pr.: Senior standing and consent of instructor. PE-702-0-0835

PE 703. Minority Groups in Sports. (3) The contributions by, problems of, and discrimination against minority groups in sports. Pr.: SOCIO 211, PE 340, PSYCH 435, or HIST 539. PE-703-0-0835

PE 710. Measurement and Evaluation in Physical Education. (3) I, II. Techniques of measuring and evaluating, including the application of statistics to skill and written test theory, construction and critique of tests. Pr.: STAT 320 and all other physical education core classes. PE-710-0-0835

PE 718. Film Analysis of Sport. (3) On sufficient demand. The analysis of human movement using film, tape, and other related aids. Pr.: PE 330. PE-718-0-0835

PE 731. The Physical Education Curriculum. (3) II, in even years. Principles of curriculum development for physical education in grades K–12. Pr.: EDCI 476 or EDCI 469. PE-731-0-0835

PE 735. Physical Education for the Atypical. (3) Techniques for assessing the needs and functioning level of exceptional people of all ages and for developing and evaluating programs. Two hours lec. and two hours lab. Pr.: PE 561 or EDAF 623 or permission of instructor. PE-735-1-3-0835

PE 755. Adult Exercise Programs. (3) The study of the implementation of fitness programs for the general public in such settings as fitness businesses, clinics, clubs, corporate programs, and adult fitness classes. Topics will include exercise for weight control, exercise and the aging adult, and the development of lifetime fitness educational programs. Pr.: PE 335. PE-755-0-0835

PE 759. Exercise Testing and Prescription. (3) Extensive coverage of laboratory exercise evaluations (proper administration, test selection, test interpretation). Prescription of exercise programs based upon test results. Emphasis on the variety of laboratory tests used to quantify exercise capacity in normal and diseased populations. Cardiac rehabilitation programs and the use of exercise testing to identify individuals at risk. Emphasis on preparation for ASCM certification and use of exercise testing to identify individuals at risk. Two hours rec. and two hours lab a week. Pr.: PE 335. PE-759-1-5-0835

PE 775. Seminar in Physical Education. (Var.) Recent trends and problems in physical education. Pr.: Senior standing and consent of instructor. PE-775-0-0835

PE 792. Internship in Exercise Science. (6–8) I, II, S. Supervised field experience for the exercise science major in training settings such as YMCA, YWCA, municipal recreation agency, or industrial fitness agency. May be completed with half-time assignment for 12–16 weeks or full-time assignment for 6–8 weeks. Pr.: PE 759. PE-792-2-0835

PE 796. Topics in Physical Education. (1–4) PE-796-3-0835

PE 799. Problems in Physical Education. (Var.) Pr.: Background of courses needed for problem undertaken. PE-799-3-0835

Graduate credit

PE 800. Advanced Physiology of Exercise. (3) II. An in-depth study of the physiological responses of the human body during exercise, the adaptations that occur with exercise training, and the laboratory techniques to assess these responses and adaptations. Pr.: PE 335. PE-800-1-8-0835

PE 802. The Athletic Directorship. (3) On sufficient demand. The administration of the intercollegiate or interscholastic athletic program with focus on the problems facing the chief administrator of the programs. Areas of study include association rules and regulations, implications of legislation, crowd control and management, scheduling, and budget. Pr.: PE 359 or EDAF 611. PE-802-0-0835

PE 805. Sport and Human Behavior. (3) A study of the state of the sport performer and the effects of sport on human behavior. Pr.: PE 340 or 9 hours of graduate credit in psychology (500 level or above). PE-805-0-0935

PE 806. Motor Development. (3) On sufficient demand. A study of psychomotor development. The focus is on the growth years, though developmental considerations for all age groups are considered. Implications for sport, exercise, and physical activity are discussed. Pr.: PE 320. PE-806-0-0835

PE 807. Motor Learning and Control. (3) Application of learning principles to skill acquisition in sport and human domain; and practical applications. Pr.: PE 320 or 9 hours of graduate credit in psychology (500 level or above). PE-807-0-0835

PE 808. Advanced Issues in Sport Sociology. (3) An in-depth analysis of the sociology of sport literature with special interest in critiquing the theoretical frameworks and methodologies employed. Pr.: PE 340 or SOCIO 435. PE-808-9-0835

PE 810. Evaluation in Physical Education. (3) On sufficient demand. A study of basic techniques used to evaluate objectives, conduct research, and conduct laboratory experiments in physical education. Pr.: PE 710. PE-810-0-0835

PE 815. Research Methods in Physical Education and Leisure Studies. (3) I. A study of techniques of research including the design of experiments and the use of appropriate statistics. PE-815-0-0835

PE 825. Mechanical Analysis of Human Movement. (3) I. A study of mechanical principles applied to analysis of human movement including cinematographical analysis of sports activities. Pr.: PE 330. PE-825-0-0835

PE 830. The Child in Sport. (3) On sufficient demand. Factors prompting children's entry into sports and the consequences of participation in organized sports for children. Pr.: PE 320 or EDAF 215. PE-830-0-0835

PE 897. Research in Physical Education. (Var.) Pr.: Sufficient training to carry on the line of research undertaken. PE-897-4-0835

PE 898. Master's Report. (1-4) PE-898-4-0835

PE 899. Master's Thesis. (1-6) PE-899-3-0835

Leisure studies

Undergraduate credit

LS 210. Leisure in Society. (3) I. Influence of leisure in today's culture. Examination of the relationships between leisure, work, leisure-related resources, and the individual. An overview of the leisure service profession. LS-210-0-2103

LS 320. Recreational Leadership. (3) I. Principles and methods of organizing communities for leisure activities. LS-320-0-2103

LS 481. Participation in Recreation. (2) II. Directed experience in recreation/leisure service agencies. An evaluation and reports on experiences within the agencies will be done. Pr.: LS 320. LS-481-2-2103

LS 487. Recreation Facility Management. (3) II. Study of planning, operations, and management of public, private, voluntary, and commercial recreation facilities. Facilities examined include community centers, swimming pools, craft centers, roller and ice rinks, court areas, and game fields. Two hours lec. and two hours lab. Pr.: LS 320. LS-487-1-5-2103

LS 488. Recreation for Special Populations. (3) I. Study of recreation programs for special populations. Characteristics of the disabled, disadvantaged, mentally ill, retarded, aged, physically handicapped, etc. Pr.: LS 320 and consent of instructor. LS-488-0-2103

LS 489. Recreation Program. (3) I, II. A study of the program forms and structures related to public, voluntary, military, private, and commercial agencies. LS-489-0-2103

LS 490. Recreation Administration I. (3) I. Development and evaluation of recreation patterns, programs, and structures. LS-490-0-2103

LS 491. Seminar in Recreation. (2) I, II. The study of current trends and issues in recreation. Pr.: LS 481. LS-491-0-2103

LS 492. Internship in Leisure Service Agencies. (15) I, II, S. Intensive practical experience over a 15-week, 600-hour period in an approved recreation/leisure service agency. Pr.: LS 491. LS-492-2-2103

LS 493. Therapeutic Recreation Service. (3) II. The development of competencies in the therapeutic techniques used in servicing special populations in public and institutional settings. Examination of medical and nonmedical models of implementation service. Pr.: LS 488 or consent of instructor. LS-493-0-2103

LS 494. Internship in Therapeutic Recreation Agencies. (15) I, II, S. Intensive practical experience over a 15-week, 600-hour period in an approved therapeutic recreation site. Pr.: LS 491. LS-494-2-2103

LS 497. Topics in Leisure Studies. (1-3) I, II, S. Selected topics dealing with leisure theory, development or application of principles of leisure programs. LS-497-0-2103

LS 498. Honors Tutorial in Leisure Studies. (1-3) I, II. Individually directed research/creation endeavor leisure studies, normally as a preliminary to writing a senior honors thesis. May be repeated once to a total of three hours. Pr.: Sophomore standing, membership in the honors program of the College of Arts and Sciences, and permission of instructor. LS-498-0-2103

LS 499. Senior Honors Thesis. Open only to seniors in the arts and sciences honors program. LS-499-0-2103

LS 501. Therapeutic Recreation Processes in Rehabilitation Agencies. (3) II. A study of the standard treatment processes in therapeutic recreation. Focus is on group implementation, assessment, evaluation, and documentation within a team concept in rehabilitation/institutional agencies where clientele are developmentally disabled, mentally ill, physically handicapped, offenders, aged, or disadvantaged. Pr.: LS 488 or EDAF 622. LS-501-0-2103

LS 520. Leisure Studies Research Methods. (3) I. A study of basic research techniques and the application of these methods to recreation assessments, evaluation, and analyses. Pr.: STAT 320 or 330. LS-520-0-2103

LS 599. Independent Studies in Leisure Studies. (1-3) Selected topics in recreation. Maximum of 3 hours applicable toward a degree. Pr.: Consent of instructor. LS-599-3-2103

Undergraduate and graduate credit

LS 705. Recreation Theory and Policy. (3) I, II. On sufficient demand. Development of theory and resulting recreational policies for public, community, institutional, and private agencies. Pr.: LS 489. LS-705-0-2103

LS 725. Recreation Administration II. (3) I. Development of administrative procedures as applied to programs, personnel, and facilities. Design administrative models and apply theories to the recreation/leisure field. Pr.: LS 490. LS-725-0-2103

LS 799. Problems in Recreation. (Var.) Pr.: Background of courses needed for problem undertaken. LS-799-3-2103

Physics

James C. Legg,* Head

Professors Bhalla,* Cocke,* Folland,* Gray,* Legg,* Lin,* Manney,* McGuire,* Richard,* Sorensen,* Weaver,* and Zollman;* Associate Professors Hagmann,* O'Shea,* and Rahman;* Assistant Professors Ben-Itzhak,* Chakribarti, DePaola,* Giese,* Jiang,* Law,* and Wysin;* Temporary Assistant Professors Priest and Schmidt; Research Associates Carnes, Dunn, Eliminyawi, Hadjista-

moulou, Lin, Nafis, Needham, Rankin, Regehr, Schulz, Shingal, Stockli, Straton, Tipping, and Zouros; Emeriti: Professors Cardwell,* Curnutte,* Dale,* Dragsdorf,* Ellsworth,* and Williams;* Associate Professor Crawford;* Instructor Green.

Physics is a quantitative science based on observation and experiment. Students of physics learn, often by performing experiments themselves, how a body of experimental data suggests an experimental law. Then they see how this experimental law can be generalized and tested by further experiment. However, it is as the originator of the next step in the method of science that physics emerges as the foundation of our technological age. The collection of experimental laws is studied and when properly generalized and tested is unified into a fundamental physical principle.

Undergraduate study

A major in physics equips a liberal arts student with a broad education that is uniquely adapted to our time. The physics curriculum provides a broad science background suitable for the creative application of science and mathematics to interdisciplinary problems. Although physics does not exclude the intuitive mind, the emphasis on mathematics tends to favor more analytically talented individuals.

A student of physics may obtain either a bachelor of arts or a bachelor of science degree with a major in physics. In addition to the general requirements for the bachelor of arts or bachelor of science degree a physics major must complete the following core courses:

| | | |
|-------------------|---------------------------------------|---|
| PHYS 100 | Undergraduate Physics Seminar | 1 |
| PHYS 213 | Engineering Physics I | 5 |
| PHYS 214 | Engineering Physics II | 5 |
| PHYS 506 | Physics Laboratory | 3 |
| PHYS 522 | Mechanics I | 3 |
| PHYS 532 | Electricity and Magnetism I | 3 |
| PHYS 551 | Introduction to Modern Physics | 3 |
| PHYS 636 | Physical Measurements Instrumentation | 4 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| MATH 240 | Elementary Differential Equations | 4 |
| Science electives | | 9 |

The 9 hours of science electives may be selected with approval of the physics department undergraduate advisor from courses, 400 level or higher, in the Departments of Chemistry, Computing and Information Sciences, Geology, Mathematics, Physics, Statistics, the Division of Biology, the College of Engineering, and other departments as appropriate to the student's program. The courses selected to satisfy the science elective requirement should contribute to the student's educational goals and must be approved by the Department of Physics.

Transfer students

The flexibility of the physics curriculum permits individual advisement, on the basis of studies completed, for students who transfer into the curriculum from other majors, community colleges, or other universities.

A five-year dual degree program in physics and mechanical engineering is available and similar dual degree programs can be arranged with physics and electrical engineering, nuclear engineering, or business administration. Interested students should inquire about these programs at the Department of Physics.

Graduate study

The Department of Physics offers work leading to the degrees master of science and doctor of philosophy. Students planning a career in research or teaching physics in a college or university should plan a program leading to an advanced degree. Students planning a career in teaching physics at high school or junior college level should consult with the College of Education for information on programs in physics and physical science teaching.

For admission with full graduate standing into an advanced degree program in physics, a student must have completed undergraduate courses equivalent to those in the undergraduate physics core described above. Prospective graduate students whose undergraduate training does not meet these requirements may be admitted on a provisional basis. Such students are required to remedy deficiencies in undergraduate preparation by completing the undergraduate courses without receiving graduate credit.

Information on the undergraduate and graduate programs, supporting facilities, financial support, and research activities in physics may be obtained from the head of the Department of Physics. Some of the major items of scientific equipment are described in the Research Resources section of this catalog.

Courses in physics

PHYS 017. Colloquium in Physics. (0) I, II. Weekly lectures on topics of current interest in physics by faculty and visiting scientists. PHYS-017-0-1902

Undergraduate credit

PHYS 100. Undergraduate Physics Seminar. (1) I. Topics of special interest to freshmen majoring in physics. Subjects discussed include possible careers in physics, current research at KSU, and selected developments illustrating the methodology of physics. PHYS-100-2-1902

PHYS 101. The Physical World I. (3) I, II, S. The courses The Physical World I and II are designed to present a nonmathematical overview of the physical sciences for students who have little or no previous physical science. The Physical World I is principally physics and atomic theory. The observations and phenomena are simple and basic; no complex equipment is used. Three hours lec. a week. Open only to freshmen, sophomores, and first-semester transfer

students. Not available for credit to students who have credit in PHYS 106. PHYS-101-0-1901

PHYS 102. The Physical World II. (3) I, II. Continuation of PHYS 101. The Physical World II presents an overview of astronomy, geology, chemistry, and molecular biology. Three hours lec. a week. Not open to seniors. Pr.: PHYS 101. PHYS-102-0-1901

PHYS 103. The Physical World I Laboratory. (1) I, II, S. Two hours lab a week. Pr. or conc.: PHYS 101. PHYS-103-1-1901

PHYS 104. The Physical World II Laboratory. (1) II. Two hours lab a week. Pr. or conc.: PHYS 102. PHYS-104-1-1901

PHYS 106. Concepts of Physics. (4) I. An introductory course in physics which emphasizes the topics of physics normally presented to elementary school children. A qualitative approach with integrated laboratory, this course is recommended for students preparing for careers as elementary school teachers. Not available for credit to students who have completed PHYS 101. PHYS-106-1-1901

PHYS 107. Physical Science Colloquium. (1-2) Offered by TELENET. Topics in physical science chosen to illustrate current research of scientists and methods used to study the physical universe. At each offering of this course a syllabus will be available giving the topics to be studied and the details of administration of the course. May be repeated once. Not open to physics majors. PHYS-107-0-1901

PHYS 113. General Physics I. (4) I, II, S. A basic development of the principles of mechanics, heat, fluids, oscillations, waves, and sound. Emphasis is on conceptual development and numerical problem solving. Two hours lec., one hour rec., one hour quiz, and two hours lab a week. Pr.: MATH 150 or one and one-half units of high school algebra and one unit high school trigonometry. PHYS-113-1-1902

PHYS 114. General Physics II. (4) I, II, S. The continued treatment of the fundamentals of electricity and magnetism, light and optics, atomic and nuclear physics. These concepts are used to understand D.C. and A.C. circuits, motors, and generators. Emphasis is placed on conceptual development and problem solving. Two hours lec., one hour rec., one hour quiz, and two hours lab a week. Pr.: PHYS 113. PHYS-114-1-1902

PHYS 115. Descriptive Physics. (4) I, II. A one-semester course in physics covering mechanics, electricity, heat, light, sound, and atomic theory. It presents a survey of the major fields of physics with a concentration on how physicists work to understand and describe physical phenomena. Three hours lec., one hour quiz, and two hours lab a week. Pr.: High school algebra. PHYS-115-1-1902

PHYS 125. Physics for Musicians. (3) II. Selected topics applied to the physics of music and musical instruments. PHYS-125-0-1902

PHYS 191. Descriptive Astronomy. (3) I, II. A qualitative study of the sun and planets, stars and galaxies; a survey of what is known about the universe and how it is known. PHYS-191-0-1911

PHYS 193. Descriptive Meteorology. (3) Nontechnical treatment of the fundamentals of modern meteorology and associated physical processes. PHYS-193-0-1913

PHYS 213. Engineering Physics I. (5) I, II. Mechanics and heat; for students of science and engineering. Two hours lec., two hours rec., one hour quiz, and two hours lab a week. Pr. or conc.: MATH 221. PHYS-213-1-1902

PHYS 214. Engineering Physics II. (5) I, II. Sound, electricity, magnetism, light, and modern physics; for students of science and engineering. Two hours lec., two hours rec., one hour quiz, and two hours lab a week. Pr.: PHYS 213, MATH 221. PHYS-214-1-1902

PHYS 300. Physics in Relation to Other Disciplines. (1-3) On sufficient demand. Variable content, offered only by rearrangement with the physics department and with the instructor. A brief syllabus will be available for each offering of PHYS 300 outlining the objectives and organization of the course for the semester in which offered. Pr.: Consent of instructor. PHYS-300-3-4900

PHYS 301. Physics Honors Seminar. (1-3) On sufficient demand. Open only to students in the arts and sciences honors program. Other students may be enrolled with permission of the instructor. PHYS-301-0-1902

PHYS 400. Independent Study in Physics. (1-3) I, II, S. Independent theoretical or experimental investigation of a topic for physics majors or for a senior honors thesis. May be repeated for credit up to a maximum of 6 hours. Pr.: Junior standing and consent of instructor. PHYS-400-3-1902

PHYS 451. Principles of Contemporary Physics. (3) II. A nonmathematical introduction to twentieth century physics: relativity, quantum mechanics, the physics of solids, and fundamental particles. Not open to physics majors. Credit is not granted for both PHYS 451 and PHYS 452. Pr.: PHYS 101 or equiv. PHYS-451-0-1902

PHYS 452. Contemporary Physics: Problems and Principles. (4) II. An introduction to twentieth century physics; relativity, quantum mechanics, the physics of solids, and fundamental particles. The lectures are in common with PHYS 451. Three hours lec. and one hour rec. each week. The recitation will consider the quantitative aspects of the subject matter. Not open to physics majors. Credit is not granted for both PHYS 451 and PHYS 452. Pr.: One year of college physics (PHYS 113 and 114 or equiv.), college algebra, and trigonometry. PHYS-452-0-1902

PHYS 460. Undergraduate Topics in Physics. (1-6) Special topics in physics not completely treated in other courses. On sufficient demand. Pr.: PHYS 114 or equiv. PHYS-460-0-1902

PHYS 495. Astronomy. (3) Topics in modern astronomy. Use of a telescope for observational astronomy will be emphasized. Two hours lec. and two hours independent observational astronomy a week. Pr.: PHYS 191. PHYS-495-1-1911

Undergraduate and graduate credit in minor field

PHYS 506. Physics Laboratory. (3) I. This course gives the advanced undergraduate student an opportunity to perform experiments of historical and current significance and to develop knowledge of and skill in making measurements with precise mechanical, optical, electrical, and thermal instruments. Various data analysis techniques are considered. One hour rec. and six hours lab each week. Pr.: PHYS 551. PHYS-506-2-1902

PHYS 515. Physics for Science Teachers. (1-4) Study of current topics in physics, with laboratory experience and demonstration of the processes or phenomena under consideration. Topics and activities will be directed toward providing teachers with material for demonstrations and student experiments or projects. Examples of topics are: solar power, laser applications, holography, and subnuclear particles, relativity, or the historical development of some physical concept. May be repeated for a maximum of 6 hours credit. Pr.: One year of college physics. PHYS-515-0-1902

PHYS 522. Mechanics I. (3) I. Principles of statics and dynamics of particles and rigid bodies by the methods of the calculus. Pr.: PHYS 214; MATH 240 or conc. enrollment. PHYS-522-0-1902

PHYS 523. Mechanics I Recitation. (2) I. Discussion section for problems presented in PHYS 522. Pr.: Students must be concurrently enrolled in PHYS 522. PHYS-523-0-1902

PHYS 525. Physics of Sound. (3) I. Topics covered include the properties of sound waves, the harmonic structure of sound, sound perception, room acoustics, the acoustical, mechanical, and electrical factors influencing sound reproduction, and factors involved in speaker enclosure design. Pr.: PHYS 114 or 214. PHYS-525-0-1901

PHYS 532. Electricity and Magnetism I. (3) II. A study of electric and magnetic fields using the calculus. The development and uses of Maxwell's equations. Pr.: PHYS 214; MATH 240 or conc. enrollment. PHYS-532-0-1902

PHYS 551. Introduction to Modern Physics. (3) II. An introduction to atomic, solid state, and nuclear phenomena, the development of the quantum theory, and relativity. Pr.: PHYS 214; MATH 240 or conc. enrollment. PHYS-551-0-1902

PHYS 553. Introduction to the Physics of Lasers. (3) I. A study of the physics of lasers. Survey of current laser systems. Technological applications. Pr.: PHYS 214. PHYS-553-0-1902

PHYS 561. Geophysics. (3) II, in alternate years. Principles and methods of exploration geology by physical methods. Pr.: PHYS 214; MATH 221. PHYS-561-0-1916

Undergraduate and graduate credit

PHYS 611. Introduction to Quantum Mechanics. (3) I. An introduction to quantum mechanics: wave mechanics, one-dimensional solutions, perturbation theory, time-dependent perturbation theory, the one electron atom. Pr.: PHYS 522, 551; MATH 240. PHYS-611-0-1902

PHYS 616. Advanced Physics Laboratory. (1-3) II. A laboratory course that gives the advanced physics student an opportunity to perform experiments using modern data acquisition equipment and tools such as are used in current physics research. Pr.: PHYS 506 or equiv. PHYS-616-0-1902

PHYS 621. Mechanics II. (3) II. Continuation of PHYS 522. Pr.: PHYS 522. PHYS-621-0-1902

PHYS 631. Electricity and Magnetism II. (3) I. Continuation of PHYS 532. Pr.: PHYS 532. PHYS-631-0-1902

PHYS 635. Plasma Physics. (3) I, in alternate years. Fundamental properties of plasmas; motion of ions and electrons in electromagnetic fields; plasmas as magneto-hydrodynamic fluids; plasma waves; diffusion phenomena in plasmas; electric resistivity of plasmas; equilibrium and plasma stability; kinetic theory of plasmas. Three hours rec. a week. See NE 635. Pr.: PHYS 532; or EECE 557 and PHYS 621. PHYS-635-0-1902

PHYS 636. Physical Measurements Instrumentation. (4) II. A laboratory-oriented course to acquaint students with electronic circuits, their interfacing with measuring instruments, and their use in making physical measurements. Two hours lec. and six hours lab a week. Pr.: PHYS 214. PHYS-636-1-1902

PHYS 651. Introduction to Optics. (3) I, in alternate years. Introduction to modern concepts in optics: electromagnetic waves, propagation of light through media, geometric optics of lenses and mirrors, interference, coherence, Fraunhofer and Fresnel diffraction. Three hours lec. a week. Pr.: PHYS 532 or EECE 557. PHYS-651-0-1902

PHYS 652. Electron Microscopy. (3) Introduction to the theory and practice of electron microscopy and electron diffraction; basic and high resolution techniques, amplitude and phase imaging, and dynamical theory of diffraction. Two hours lec., two hours lab a week. Pr.: PHYS 214, MATH 240. PHYS-652-0-1902

PHYS 671. Thermodynamics and Statistical Physics. (3) II, in alternate years. Pr.: PHYS 522; MATH 240. PHYS-671-0-1902

PHYS 681. The Physics of Semiconductors and Magnetic Materials. (3) I, in alternate years. Introduction to the properties of semiconducting materials; electron and hole transport; models of semiconducting devices; magnetic ordering and hysteresis; survey of magnetic materials and magnetic storage devices. Pr.: PHYS 532 or EECE 557. PHYS-681-0-1902

PHYS 691. Astrophysics. (3) A quantitative study of the sun and stars; structure and evolution; intrinsic properties; solar activity; galaxies; chemical evolution. Pr.: PHYS 522, 532. PHYS-691-0-1912

PHYS 707. Topics in Physics. (Var.) I, II, S. Special topics courses. Topics and credits announced for the semester in which offered. May be given in conjunction with lecture series by visiting scientists. Pr.: Graduate standing or senior standing and consent of instructor. PHYS-707-3-1902

PHYS 742. Nuclear Physics. (3) II, in alternate years. Modern theories of nuclear physics. Pr.: PHYS 611. PHYS-742-0-1904

PHYS 781. X-Ray and Crystal Physics. (3) II, in alternate years. Pr.: PHYS 532. PHYS-781-0-1902

PHYS 786. X-Ray Laboratory. (1) II, in alternate years. Three hours lab a week. Pr. or conc.: PHYS 781. PHYS-786-1-1902

Graduate credit

PHYS 800. Problems in Physics I. (1) II. Independent study of the solution of advanced problems in physics at a level appropriate to the M.S. degree. Pr.: Graduate standing and consent of instructor. PHYS-800-3-1902

PHYS 801. Mathematical Methods of Physics. (3) I. Mathematical techniques for the solution of physical problems. Mathematical topics employed include vector and tensor analysis, matrices, group theory, complex variable theory, differential equations, Sturm-Liouville theory, orthogonal functions, special functions, Fourier series, integral transforms, and the calculus of variations. Pr.: PHYS 621. PHYS-801-0-1901

PHYS 802. Computational Methods in Physics. (4) II. Methods of solving physical problems using digital computers including numerical differentiation and integration, error analysis and curve fitting, interpolation, ordinary and partial differential equations, matrix operations, eigenvalues, special functions of mathematical physics, Monte Carlo simulations, and stability of solutions; a practicum is an integral part of the course. Two hours lec. each week. practicum self-paced. Pr.: CIS 580, CIS 675, or MATH 655, PHYS 801, and a working knowledge of FORTRAN. PHYS-802-2-1902

PHYS 806. Journal Club. (Var.) I. Seminar in current topics in physics. Pr.: Graduate standing in physics. PHYS-806-2-1902

PHYS 808. Advanced Problems. (Var.) I, II, S. Independent study in a special problem in physics at the graduate level chosen with the advice of a faculty mentor. Pr.: Graduate standing and consent of instructor. PHYS-808-3-1902

PHYS 811. Quantum Mechanics I. (3) II. Pr.: PHYS 611, 801. PHYS-811-0-1902

PHYS 821. Advanced Dynamics. (3) II. Pr.: PHYS 801. PHYS-821-0-1902

PHYS 831. Electrodynamics I. (3) I, in alternate years. Pr.: PHYS 631. PHYS-831-0-1902

PHYS 841. Lasers and Quantum Optics. (3) The theory of lasers and laser-matter interactions: rate equations, line broadening, mode structure, Q-switching, three and four wave mixing, linear and stimulated light scattering. Pr.: PHYS 611 or equiv. PHYS-841-0-1902

PHYS 850. Theory of Atomic Structure and Atomic Interactions. (3) I, in alternate years. The quantum mechanics of atomic structure and spectra: one and two electron atoms, many electron atoms, molecular structure and spectra, atomic collision theory for electron-atom and ion-atom collisions. Pr.: PHYS 611. PHYS-850-0-1902

PHYS 852. Molecular Spectra. (3) Molecular energy levels and the origin of spectra. Pr.: PHYS 611. PHYS-852-0-1903

PHYS 860. Electron and Ion Impact Phenomena. (3) II, in alternate years. Atomic collision phenomena; experimental techniques in accelerator-based atomic physics; charged particle and photon spectroscopy; elastic, inelastic, and rearrangement collisions; and applications. Pr.: PHYS 611. PHYS-860-0-1902

PHYS 881. Introduction to Solid State Physics. (3) I, in alternate years. Introduction to the physics of condensed matter: crystal lattices; lattice dynamics; electron energy bands; fermi surfaces; optical, magnetic, and transport properties of insulators, semiconductors, and metals. Pr.: PHYS 611 or conc. enrollment. PHYS-881-0-1902

PHYS 899. Research in Physics. (Var.) I, II, S. Master's level research. Pr.: Consent of instructor. PHYS-899-4-1902

PHYS 910. Problems in Physics II. (1) Independent study of the solution of advanced problems in physics at a level appropriate to the Ph.D. degree. Pr.: PHYS 800 and consent of instructor. PHYS-910-3-1902

PHYS 911. Quantum Mechanics II. (3) I. Pr.: PHYS 811. PHYS-911-0-1902

PHYS 912. Advanced Quantum Mechanics. (3) Relativistic quantum mechanics; scattering theory; second quantization and the many-body problem; introduction to quantum electrodynamics. Pr.: PHYS 911. PHYS-912-0-1902

PHYS 913. Advanced Topics in Mathematical Physics. (3) Critical studies of selected advanced topics. May be repeated once for credit. Pr.: PHYS 801. PHYS-913-0-1902

PHYS 914. Quantum Field Theory. (3) On sufficient demand. Pr.: PHYS 901. PHYS-914-0-1902

PHYS 931. Electrodynamics II. (3) II. Pr.: PHYS 631. PHYS-931-0-1902

PHYS 941. Advanced Nuclear Physics. (3) Pr.: PHYS 742, 911. PHYS-941-0-1904

PHYS 943. Advanced Topics in Nuclear Physics. (3) Critical studies of selected advanced topics. May be repeated once for credit. Pr.: PHYS 742. PHYS-943-0-1904

PHYS 951. Advanced Topics in Molecular Spectroscopy. (3) Critical studies of selected advanced topics. May be repeated once for credit. Pr.: PHYS 852. PHYS-951-0-1903

PHYS 952. Advanced Topics in Optics. (3) Critical studies of selected advanced topics. May be repeated once for credit. Pr.: PHYS 651. PHYS-952-0-1902

PHYS 953. Advanced Topics in Atomic Interactions. (Var.) Critical studies of advanced topics in atomic interactions. Pr.: PHYS 611. PHYS-953-3-1904

PHYS 971. Statistical Mechanics. (3) I. Pr.: PHYS 611, 671, 821. PHYS-971-0-1902

PHYS 981. Solid State Physics. (3) II, in alternate years. Continuation of PHYS 881. Quantized lattice vibrations, methods of band structure calculations, effective mass formulations, applications to optical absorption, excitons, magnetism, and superconductivity. Pr.: PHYS 881, 611. PHYS-981-0-1902

PHYS 982. Advanced Topics in Solid State Physics. (3) Critical studies of selected advanced topics. May be repeated once for credit. Pr.: PHYS 782. PHYS-982-0-1902

PHYS 999. Research in Physics. (Var.) I, II, S. Doctoral level research. Pr.: Consent of instructor. PHYS-999-4-1902

Political Science

William L. Richter,* Head

Professors Hajda,* L. Richter,* W. Richter,* Suleiman,* Tummala,* and Williams;* Associate Professors Franke,* Gustafson,* Linford,* Michie,* and Unekis;* Assistant Professor Ambrosius.*

Undergraduate study

The major in political science acquaints the student with the political aspects of society and encourages the student to develop a critical and imaginative spirit with which to look at public issues. Since political issues reflect the broader contemporary situation, the program in political science also provides the foundation for a liberal education on which to build a continuing, responsible interest in political activity and public affairs. At the same time, scientific training in the analysis of political problems equips the student with the skills necessary to choose among a variety of careers in public service, business, teaching, research, and administration. Qualified students should be stimulated to seek advanced training in political science at the graduate level.

A political science major should complete a broad liberal arts program that includes study in related social sciences and provides familiarity with computer applications, statistics, and mathematics as basic tools describing and explaining political phenomena.

Advisory and special services

Departmental

Several members of the department have backgrounds in nonacademic careers—including national and international government service, business, party politics, and journalism—besides professional training in political science. Students contemplating careers in these and other fields are encouraged to talk with departmental advisors.

Pre-law program

A pre-law program may be pursued through a major in political science. An especially qualified pre-law advisor helps the student select an appropriate course of study leading to a career in law, and offers individual assistance in selecting a law school. The pre-law advisor is Professor Orma Linford, 219C Kedzie Hall.

Public administration option

The public administration option within the political science major acquaints the student with the place of administration in the United States and abroad, the role of the administrator in the political process, and the use of analytical and quantitative techniques in meeting management

problems in the public sector. Interested students should see the M.P.A. director or other M.P.A. faculty.

Specialized curricula

The department takes part in several interdepartmental programs whereby students coordinate work around a specific set of phenomena.

South Asian studies

The department participates in the University-wide South Asian studies program (see detailed information under South Asian Studies, in this catalog). For information, see Professor Aruna Michie, 219A Kedzie Hall.

Latin American studies

Courses on Latin America are offered in several departments, including language studies in both Spanish and Portuguese. A secondary major in Latin American studies is also available. For information, see Professor Joseph Hajda, 220A Kedzie Hall.

International studies

Students interested in the multidisciplinary study of the relations among nations, or in the study of world regions other than South Asia or Latin America, may wish to pursue a secondary major in international studies. For information, see Professor William Richter, 204A Kedzie Hall.

Armed forces and society

Political science and several other departments offer coordinated course work in military phenomena and security processes, ranging from the technology of war and military policy-making to the problems of civilian-military relations in peacetime and arms control. Some of the relevant courses are in history, geography, psychology, sociology, economics, and nuclear engineering. For information, see Professor Alden Williams, 217 Kedzie Hall.

International trade studies

The department participates in the University-wide international trade studies (see detailed information under Graduate School in this catalog). Students interested in international trade may benefit from courses and programs on this subject in several arts and sciences and business departments.

Interested students should contact the chair of the International Trade Studies Committee, Professor Joseph Hajda, 220A Kedzie Hall.

Gerontology

The Kansas State University Center on Aging coordinates programs and courses on social, cultural, economic, political, and other aspects of aging and the elderly. Interested students may pursue a secondary major in gerontology. For information see Professor James Franke, 206A Kedzie Hall.

Requirements for the major

A major consists of a minimum of 30 credit hours in political science distributed as follows: three courses from among POLSC 301, Introduction to Political Thought, POLSC 325, United States Politics, POLSC 333, World Politics, and POLSC 344, Introduction to Comparative Politics. Also, majors are required to take at least one 500 level course or above in each of the following four areas of political science: American government and politics; comparative government and politics; international relations; and political thought. Only 3 hours of the major are allowed to be readings, problems, internships, or similar courses that do not involve scheduled meetings of the class.

Students taking the public administration option are required to complete a minimum of 33 hours and must meet all requirements for the major. The core courses required of all students taking the public administration option are: POLSC 377, Introduction to Public Policy, POLSC 507, Introduction to Public Administration, POLSC 708, Public Personnel Administration, POLSC 737, Public Budgeting Techniques. The program has a general administration concentration with enough flexibility to permit students to take electives in supporting areas such as business, social work, corrections, regional and community planning, health, physical education, and recreation. The choice of electives is made with the advice and supervision of the public administration advisor.

Information for dual majors and nonmajors

The political science program is often advantageously combined with another major area. Those seeking dual majors should coordinate their program in consultation with advisors in each area. To encourage the widest possible undergraduate involvement in systematic political analysis, many political science courses numbered 100 through 799 are open to nonmajors meeting the necessary prerequisites.

Graduate study

The Department of Political Science offers work leading to the master of arts and master of public administration degrees.

Master of arts (30 hours)

The master of arts program meets the educational needs of three groups of students: (1) those planning to become high school teachers or instructors in two-year colleges; (2) working professionals and other adults desiring to improve their qualifications or seeking a greater understanding of political life; and (3) students wishing to prepare for Ph.D. or other advanced study. The degree requirements are structured, therefore, to provide students with an education which prepares them for a mature grasp of politics, a

respect for intellectual integrity, and an ability to communicate effectively.

Graduate work in political science is offered in American government and politics, comparative government and politics, international relations, and political thought. All candidates for the master of arts degree are required to take the following:

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| POLSC 700 | Research Methods in Political Science | 3 |
|-----------|---|---|

At least three seminars from:

| | | |
|-----------|---|---|
| POLSC 805 | Seminar: American Government Problems | 3 |
| POLSC 821 | Seminar: Political Thought | 3 |
| POLSC 811 | Seminar: International Politics | 3 |
| POLSC 841 | Seminar: Comparative Politics | 3 |

No more than three hours of "nonclass" seminars or courses (e.g., readings, problems, internships) are allowed to count toward the 30 hours required for the M.A.

Written comprehensive examinations.

An oral defense of the thesis (Option A), report (Option B), or seminar papers (Option C).

Students may choose, in consultation with their advisors, one of three programs leading to the master of arts degree:

Option A

This option requires 30 hours of graduate credit, including 6 hours of credit for a thesis. Of the remaining 24 hours, at least 18 hours must be in political science.

Option B

This option requires 30 hours of graduate credit, including 2 hours of credit for a written research report. Of the remaining 28 hours, at least 19 must be in political science.

Option C

This option requires 30 hours of graduate credit in political science, of which at least four courses should be 800-level seminars taken from at least three different professors. In addition, students in this option should write four research seminar papers acceptable to the professors involved.

Master of public administration (42 hours)

The master of public administration (M.P.A.) is a terminal professional degree program designed for those seeking a career in the public sector—federal, state, and local government; non-profit organizations; and international agencies. Besides offering extensive day-time and evening training in the core areas of public administration, the program provides flexibility through an interdisciplinary area of specialization. It endeavors to serve the needs of both pre-service students aspiring to be public administrators and mid-career students interested in professional enrichment and advancement.

The M.P.A. program requires 36 hours of course work (15 hours of "core" public administration, 9 hours of political science electives, and 12 hours in individual areas of specialization). Students are also

required to do a 6-hour internship which entails a research report. Mid-career students with significant administrative experience may request a waiver of the internship, but must still complete the research report. Also required of all students is a written comprehensive examination followed by an oral examination.

Following are the specific requirements for the M.P.A. degree:

Public administration and public policy core

Required courses

| | | |
|-----------|---|---|
| POLSC 700 | Research Methods in Political Science | 3 |
| POLSC 708 | Public Personnel Administration | 3 |
| POLSC 710 | Policy Analysis and Evaluation | 3 |
| POLSC 735 | Public Organizational Theory | 3 |
| POLSC 737 | Public Budgeting Techniques | 3 |

Area specialization

Students are encouraged to develop an interdisciplinary public administration speciality area such as labor relations, planning, public finance, personnel, or international administration.

Public administration/political science electives

Three courses are required from within the Department of Political Science curriculum, including two at the 800 level.

POLSC 897 M.P.A. Internship

Written and oral comprehensive examination

Political science

Undergraduate credit

POLSC 107. Political Science Colloquium. (2) I, II, S. Offered by TELENET. Topics in political science chosen to illustrate current research of political scientists and approaches to the study of politics. Each time the course is offered, a syllabus will outline the topics to be studied and the way the course will be administered. May be repeated once. Not open to political science majors. POLSC-107-0-2207

POLSC 110. Introduction to Political Science. (3) I, II, S. Introduction to politics, public policy, and governmental processes. Distribution and use of political power, political thought, public opinion, groups, parties, institutions, public law, careers in politics, and related topics. POLSC-110-0-2207

POLSC 111. Introduction to Political Science, Honors. (4) Introduction to politics, public policy, and governmental processes. Distribution and use of political power, political thought, public opinion, groups, parties, institutions, public law, careers in politics, and related topics. Pr.: Membership in arts and sciences honors program. POLSC-111-0-2207

POLSC 301. Introduction to Political Thought. (3) I, II. A broad overview of political thought, including consideration of major themes and leading writers in Western political philosophy, some non-Western political thought, modern ideologies, and empirical theory. Pr.: Sophomore standing. POLSC-301-0-2207

POLSC 321. Kansas Politics and Government. (3) An introduction to the political institutions of, the political behavior in and surrounding, and the public policies flowing from governmental units in the state of Kansas. POLSC-321-0-2207

POLSC 325. United States Politics. (3) I, II, S. The national government with emphasis on constitutional principles, basic structure, functions, and the political process. POLSC-325-0-2207

POLSC 333. World Politics. (3) I, II. Introduction to the study of politics among nations, including a survey of major contemporary problems of world politics and focusing on the international struggle for power and order. POLSC-333-0-2207

POLSC 344. Introduction to Comparative Politics. (3) I. Comparative analysis of politics in both "developed" and "developing" countries. Though some attention will be given to abstract and theoretical concepts, the emphasis will be on the actual political process in the countries selected for study. POLSC-344-0-2207

POLSC 350. Current Political Issues. (2) I, II. Each week a different political science faculty member explains and analyzes current developments in state, national, and international affairs, using the news media as text material. Not for major credit. May be repeated once. POLSC-350-0-2207

POLSC 355. Contemporary Issues. (3) Study and analysis of selected political topics of immediate relevancy and concern. May be repeated once. POLSC-355-0-2207

POLSC 366. Practical Politics. (3) II. Strategies and techniques of running for office, organizing a campaign, mobilizing community resources, direct action lobbying, and related practical aspects of local level citizen politics. POLSC-366-0-2207

POLSC 377. Introduction to Public Policy. (3) I. The process of public policy formation and analysis with emphasis on theories of decision-making, the relationship between decisions taken, values maximized, and the social impact of these decisions. Pr.: POLSC 110 or 325 or another social science course. POLSC-377-0-2207

POLSC 399. Honors Seminar in Political Science. (1-3) POLSC-399-0-4900

POLSC 400. Political Inquiry and Analysis. (3) Underlying principles and techniques used in the conduct of political science research. Pr.: Introductory social science course or consent of instructor. POLSC-400-0-2207

POLSC 401. Topics in Politics. (1-3) Different subjects in politics are selected for intensive study. May be repeated for a total of 6 hours with advisor's approval. POLSC-401-0-2207

POLSC 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the arts and sciences honors program. POLSC-499-4-2207

American government and politics

Undergraduate and graduate credit
POLSC 501. Political Behavior. (3) An examination and explanation of the basic terms and distinctions necessary for the study of politics, government, and political behavior emphasizing the dimensions of political behavior, including politicization, identification, ideology, participation, socialization, class, structure, and situations. Pr.: POLSC 110 or 325, or sophomore standing. POLSC-501-0-2207

POLSC 502. Television and Public Policy. (3) I. Television as a political institution, emphasizing TV structure, contents, and effects for political thought and public policy; comparative analysis of television with other mass media and nonmedia influences on political behavior. Pr.: POLSC 110 or 325, and sophomore standing, or appropriate vocational experience with consent of instructor. POLSC-502-0-2207

POLSC 507. Introduction to Public Administration. (3) I. The basic concepts of public administration, with emphasis on orientation for citizen understanding; the place of administration and the role of the administrator in the American political process; the organization and activities of government in carrying out public policy; administrative functions, organization, accountability, finance, and personnel. Pr.: POLSC 110 or 325 or ECON 110. POLSC-507-0-2207

POLSC 508. The Mass Media and Political Campaigns. (3) I. Examines the role of the mass media in the electoral process. Dynamics of voter decision making and the impact of the media on voter attitudes and choices. Pr.: POLSC 325. POLSC-508-0-2207

POLSC 519. National Security Policy and Process. (3) 1. Formation and management of contemporary U.S. security establishment and policies with emphasis on arms control, competition for resources, civilian-military relations, and interaction among Congress, the president, and the bureaucracy. Pr.: POLSC 325. POLSC-519-0-2207

POLSC 520. State and Local Government. (3) 11. The American system of federalism with emphasis on the government and politics of the American states and their subdivisions. Pr.: POLSC 110 or 325 or sophomore standing. POLSC-520-0-2207

POLSC 603. Political Parties and Elections. (3) 1. Origins, structure, and function of political parties. Dynamics of the two-party system. Roles of third parties. Analysis of election results and voting behavior. Pr.: POLSC 110, 325, or junior standing. POLSC-603-0-2207

POLSC 604. Interest Groups and Public Opinion. (3) 11. Group theory and politics. Structure, internal politics, and techniques of interest groups and their impact on public policy. Formation and measurement of public opinion. Pr.: POLSC 110 or 325 or junior standing. POLSC-604-0-2207

POLSC 605. The American Presidency. (3) The presidency as an institution, its evolution, congressional relationships, executive organization. Pr.: POLSC 110, 325, or junior standing. POLSC-605-0-2207

POLSC 606. Sex and Politics. (3) 11. Analysis of the role of sex in political behavior, including sexual differences in voting and political participation, legal and cultural restrictions on women's rights and political activity, and women's liberation and other sex-based political movements. Pr.: SOCIO 545, XXX 105, POLSC 325, or junior standing. POLSC-606-0-2207

POLSC 607. Administrative Law. (3) 11. Legal analysis of the rule-making, adjudicatory, and enforcement functions of administrative agencies, with emphasis on constitutional framework, judicial review, requirements of procedural fairness, and rights of public employees. Pr.: One course in political science, U.S. history, or legal or political philosophy. POLSC-607-0-2207

POLSC 611. The Legislative Process. (3) 11. Legislative decision-making in modern democracy with emphasis on the United States, the concept of representation, and political behavior of participants in the legislative process. Pr.: POLSC 110, 325, or junior standing. POLSC-611-0-2207

POLSC 613. Defendant's Rights. (3) 11. Constitutional provisions of due process in criminal cases; statutory protections and judicial rules; analysis of U.S. Supreme Court opinions concerning the rights of persons accused of crimes at all stages in the criminal process. Pr.: One course in political science, U.S. history, or legal or political philosophy. POLSC-613-0-2207

POLSC 614. Constitutional Law I. (3) 1. Principles of the American political system as prescribed by the Constitution and interpreted by Supreme Court decisions, with emphasis on the institutions and powers of the national government. Pr.: One course in political science, U.S. history, or legal or political philosophy. POLSC-614-0-2207

POLSC 615. Constitutional Law II. (3) 11. The Constitution as a limitation on governmental power, with emphasis on Supreme Court decisions defining fundamental liberties, property rights, and the requirement of substantive due process. Pr.: One course in political science, U.S. history, or legal or political philosophy. POLSC-615-0-2207

POLSC 616. Discrimination and the Law. (3) 11. Equal protection under the law, as provided by the Constitution, statutes, regulations, and judicial decisions, with special attention to discrimination on the basis of race and sex. Pr.: One course in political science, U.S. history, or legal or political philosophy. POLSC-616-0-2207

POLSC 618. Urban Politics. (3) 1. Fundamental problems of political power and decision making in urban-suburban governmental settings. Pr.: POLSC 110, 325, or junior standing. POLSC-618-0-2207

POLSC 619. Agricultural Politics and Policy. (3) 1. Introduction to the political-cultural problems of rural, including small-town, America as well as to the public policies designed for meeting these problems. Emphasis will be upon the nature of politics shaping the present and future of rural and small-town Kansas. Pr.: POLSC 110 or 325 or junior standing. POLSC-619-0-2207

POLSC 708. Public Personnel Administration. (3) 1. Policy aspects of public personnel administrations at all levels of government with specific attention given to personnel issues unique to the public sector. Court decisions on the rights of public employees, public unionism, civil service systems, and public service ethics in a democracy. Pr.: POLSC 325 or 507, or ECON 110 and junior standing. POLSC-708-0-2207

POLSC 709. The Politics of Intergovernmental Relations. (3) 1. An analysis of the dynamics of the federal system. Interactions among local, state, and federal governments will be examined with emphasis upon governmental policy and program management. Pr.: POLSC 507 or 520 or SOCIO 531. POLSC-709-0-2207

POLSC 710. Policy Analysis and Evaluation. (3) 11. The relationship between public policy and the distribution of values, goods, and services in society, including a study of policy evaluation. Students analyze policies in an area of choice; e.g., agriculture, business, health, income, trade. Pr.: POLSC 325 or 507 or junior standing. POLSC-710-0-2207

POLSC 717. The Administrative Process. (3) Public administration treated as a process of organization and methods management with emphasis on conditions, elements, and problems common to all levels and functions of bureaucracy. POLSC-717-0-2207

POLSC 735. Public Organizational Theory. (3) 1. Theories on the structure and mission of public organizations. A focus on the role of administrative leadership in applying theory to solve organization problems. Pr.: POLSC 325 or 507 or GENBA 420 or ECON 110 and junior standing. POLSC-735-0-2207

POLSC 737. Public Budgeting Techniques. (3) 1. Budgeting as part of our political system and as a fiscal process that assists in planning and program management. Overview of various budgetary approaches and their managerial benefits. Pr.: POLSC 507 or MANGT 420. POLSC-737-0-2207

Comparative government and politics Undergraduate and graduate credit

POLSC 504. Political Sociology. (3) 11, in even years. An introduction to the principles of political sociology. Processes of political socialization, participation within and outside established organizational channels, recruitment of elites, communication and influence, power, decision making, and policy outputs. Data are presented from a cross-national perspective. Pr.: SOCIO 211; POLSC 110. Same as SOCIO 504. POLSC-504-0-2207

POLSC 505. Introduction to the Civilization of South Asia I. (3) 1. An interdisciplinary survey of the development of civilization in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including consideration of the geographical and demographic context, dominant philosophical and social concepts, social and political institutions, literature and historical movements. Same as HIST 505, ECON 505, SOCIO 505, ANTH 505. POLSC-505-0-2207

POLSC 506. Introduction to the Civilization of South Asia II. (3) 11. Interdisciplinary survey of recent and contemporary civilization in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including recent history, current economy, religion, culture, languages and literature, geography, social and political structures and ideas. Same as ECON 506, HIST 506, SOCIO 506, ANTH 506. POLSC-506-0-2207

POLSC 511. Contemporary Chinese Politics. (3) Principal components of Communist Chinese ideology, conditions determining organizational structure, composition of present leadership, role of social forces, impact of external relations on other Asian nations and on the major world powers. POLSC-511-0-2207

POLSC 545. The Politics of Developing Nations. (3) 11. Comparative analysis of politics in emergent states with emphasis on processes of modernization and nation building. Pr.: POLSC 110 or 344 or sophomore standing. POLSC-545-0-2207

POLSC 602. Class, Power, and Public Policy. (3) 1. Public policy and socioeconomic equality. Wealth and income distribution, social insurance programs, and ethnic relations. Conditions and institutions conducive to equality with emphasis on elites and power. Pr.: POLSC 377 or 507 or junior standing. POLSC-602-0-2207

POLSC 621. European Politics. (3) 1. Comparative analysis of British democracy, totalitarianism, and contemporary continental European political systems. Pr.: POLSC 110 or 344 or junior standing. POLSC-621-0-2207

POLSC 622. Latin American Politics. (3) 1. Comparative analysis of selected political systems of Latin America emphasizing political inputs, political organization, and political outputs. Special consideration is given to problems of political change. Pr.: POLSC 110 or 344 or junior standing. POLSC-622-0-2207

POLSC 623. South Asian Politics. (3) Analysis of selected political systems of South Asia. Pr.: POLSC 344, 505, or junior standing. POLSC-623-0-2207

POLSC 624. Middle Eastern Politics. (3) 11. Comparative analysis of selected political systems in the Middle East including nationalism and the conflict of differing ideologies. Validity and usefulness of various theories of political development are tested. Pr.: POLSC 110, 344, or junior standing. POLSC-624-0-2207

POLSC 625. Southeast Asian Politics. (3) Comparative analysis of selected political systems in Southeast Asia including consideration of problems of nationalism and political development. Pr.: POLSC 110, 344, or junior standing. POLSC-625-0-2207

POLSC 626. African Politics. (3) Comparative analysis of selected political systems of sub-Saharan Africa, including consideration of problems of nationalism and political development. Pr.: POLSC 110, 344, or junior standing. POLSC-626-0-2207

POLSC 627. Soviet-Style Regimes. (3) 11. Analysis of the political systems of the Soviet Union and the countries of eastern Europe. Pr.: POLSC 110, 344, or junior standing. POLSC-627-0-2207

POLSC 628. Comparative Security Establishments. (3) 1. Politics of conceiving, organizing, using, and reconciling military and related security forces as societal functions in the United States, selected other polities, and international organizations. Pr.: POLSC 333, 344, 541, or junior standing. POLSC-628-0-2207

POLSC 629. Administration in Developing Nations. (3) 1. Administrative problems of developing nations of Asia, Africa, and Latin America; programs in development administration. Pr.: POLSC 110, 344, 377, 507, or junior standing. POLSC-629-0-2207

POLSC 707. Comparative Administrative Systems. (3) 1. This is a comparative analysis of public administration concepts and the morphology of administrative systems. Included are U.S., British, and French models and attempts by Third World countries to adapt these to their local cultures. Pr.: POLSC 344, or 507, or graduate standing, or consent of instructor. POLSC-707-0-2207

International relations**Undergraduate and graduate credit**

POLSC 541. International Relations. (3) II. Analysis of the nature of international relations with emphasis on contemporary theories explaining the international behavior of states. Pr.: POLSC 333. POLSC-541-0-2207

POLSC 543. American Foreign Policy. (3) II. Examination of American external relations since 1945 and evaluation of processes involved in the formulation and conduct of contemporary foreign policy of the United States. Pr.: POLSC 325 or 333. POLSC-543-0-2207

POLSC 642. International Conflict. (3) II. The nature of political conflicts in the world and the "types" of such conflicts. Emphasis is on determining the "causes" of the various conflict types as well as providing the student with a better understanding of the conflict process from political dispute through the escalation stages to war. Pr.: POLSC 333 and junior standing. POLSC-642-0-2207

POLSC 645. International Politics of Europe. (3) II. Relationships among post-World War II European constitutional development, national politics, foreign policies, and European communities, with attention to European considerations in global international politics. Pr.: POLSC 333, 344, or junior standing. POLSC-645-0-2207

POLSC 647. International Law. (3) Theories of international law, and general problems, such as: recognition, responsibility, war crimes, sources, evidence, codification, and settlement of disputes. Pr.: POLSC 333, 541, or junior standing. POLSC-647-0-2207

POLSC 649. International Defense Strategies. (3) I. Contemporary international strategies and defense policies with emphasis on nuclear, conventional, and guerrilla war, arms control and disarmament, diplomatic and political roles of the military. Pr.: POLSC 333, 541, or junior standing. POLSC-649-0-2207

POLSC 651. International Organization. (3) Structure, functions, values, and effectiveness of international organizations with emphasis on the United Nations, Common Market, and other regional arrangements. Pr.: POLSC 333, 541, or junior standing. POLSC-651-0-2207

POLSC 652. International Politics of South Asia. (3) Consideration of regional problems of South Asia and international roles and foreign policies of South Asian states. Pr.: POLSC 344 or junior standing. POLSC-652-0-2207

POLSC 653. International Politics of the Middle East. (3) I. Consideration of the Arab-Israeli conflict, inter-Arab relations, foreign policies of Middle Eastern states, and the impact of the major foreign powers on the area. Pr.: POLSC 333, 344, or junior standing. POLSC-653-0-2207

POLSC 754. The Professional Diplomat and Foreign Policy Formulation. (3) Present-day foreign policy formulation in the United States government, including especially the role therein of the professional diplomat and foreign affairs specialist. POLSC-754-0-2207

Political thought**Undergraduate and graduate credit**

POLSC 661. Political Thought: Classical to Sixteenth Century. (3) I. Systematic study of ideas about law, politics, and government of great philosophers of Western civilization from Greek antiquity to the sixteenth century. Pr.: POLSC 110, 301, or junior standing. POLSC-661-0-2207

POLSC 663. Political Thought: Since the Sixteenth Century. (3) I. Study of the development of Western political thought from the sixteenth century to the twentieth century. Pr.: POLSC 110, 301, or 325. POLSC-663-0-2207

POLSC 667. American Political Thought. (3) I. Political ideas underlying the American union, including the doctrine of rights, the nature of union, liberty, property, and democracy. Pr.: POLSC 110, 301, or junior standing. POLSC-667-0-2207

POLSC 671. Modern Political Thought. (3) Study of contemporary political ideas and social thought. Pr.: POLSC 110, 301, or junior standing. POLSC-671-0-2207

POLSC 675. Religion and Politics. (3) II. The history, theory, and development of church-state relationships in the United States. A theoretic and legal analysis of the relationship. Pr.: POLSC 110, 301, or junior standing. POLSC-675-0-2207

POLSC 676. Psychological Bases of Politics. (3) Interrelations between personality and political behavior. Implications for the stability of democratic political systems. Authoritarianism, the organization of opinion, and analysis of dictatorship and totalitarianism. Pr.: Two social science courses or consent of the instructor. POLSC-676-0-2207

POLSC 711. Administrative Ethics. (3) I. Ethical issues, approaches, and strategies in public service. Pr.: POLSC 325 or 507 or graduate standing, or consent of instructor. POLSC-711-0-2207

Methods, seminars, readings, and problems**Undergraduate and graduate credit**

POLSC 555. Senior Honors Seminar. (3) Open to senior majors who have attained a 3.0 grade point average in political science. POLSC-555-0-2207

POLSC 601. Computer and Quantitative Analysis in Political Science. (3) Advanced data management, data analysis, and computing skills involved in conducting political science and public policy research. Pr.: STAT 330 or equiv.; CIS 110 or equiv.; and POLSC 301, or 325, or 333, or 344, or 400. POLSC-601-0-2207

POLSC 700. Research Methods in Political Science. (3) I. Principles of research design, measurement of political phenomena, methods for collecting and analyzing political data. Pr.: POLSC 301, 325, 333, or 344. POLSC-700-0-2207

POLSC 784. Internship in Government, Public Administration, and Politics. (1-3, Credit/No Credit only.) I, II, S. Supervised field work at the international, national, state, and local levels of government or with political parties or other politically oriented voluntary organizations. May be repeated once. Pr.: Consent of instructor and a minimum of two courses in political science, at least one of which must be relevant to the internship area. POLSC-784-3-2207

POLSC 785. Readings in Political Science. (1-3) I, II, S. Students will undertake directed reading and discussion of a selected topic in political science. POLSC-785-3-2207

POLSC 790. Problems in Political Science. (1-3) I, II, S. Students will complete a research project and prepare an original paper under the supervision of a faculty member. Pr.: Consent of the instructor. POLSC-790-3-2207

POLSC 791. Topics in Political Science. (3) I, II. Extensive exploration of a specific problem in political thought, American government, comparative politics, international relations, and public administration. May be repeated for a total of 6 hours in two subfields. Since topics will cover different areas in political science, prerequisites will be determined by the department as appropriate when the course is offered. POLSC-791-0-2207

POLSC 799. Pro-Seminar in Political Science. (3) I, II. Study and analysis in various areas of the discipline with emphasis on critical evaluation of political conflicts and issues. Pr.: Junior or senior standing or consent of instructor. POLSC-799-0-2207

Graduate credit

POLSC 800. Seminar: Scope and Methodology of Political Science. (3) Exploration of theoretical foundations of political science, and critique of various analytical models in the study of political phenomena; construction and application of research designs and techniques. POLSC-800-0-2207

POLSC 805. Seminar: American Government Problems. (3) I. POLSC-805-0-2207

POLSC 811. Seminar: International Politics. (3) I. POLSC-811-0-2207

POLSC 821. Seminar: Political Thought. (3) II. POLSC-821-0-2207

POLSC 831. Seminar: Public Administration. (3) II. POLSC-831-0-2207

POLSC 841. Seminar: Comparative Politics. (3) II. POLSC-841-0-2207

POLSC 842. Seminar: Comparative Ideologies. (3) POLSC-842-0-2207

POLSC 897. M.P.A. Internship. (Var., C/NC) I, II, S. Directed off-campus employment experience. Must be taken for a total of 6 hours. POLSC-897-2-2207

POLSC 898. Master's Report. (2, C/NC) I, II, S. POLSC-898-4-2207

POLSC 899. Master's Thesis. (6, C/NC) I, II, S. POLSC-899-4-2207

Psychology

Frank E. Saal, * Head

Professors Barnett,* Cowan,* Downey,* Frieman,* Griffitt,* Harris,* Mitchell,* Phares,* Rappoport,* Saal,* Samelson,* Shanteau,* Thompson,* and Uhlarik;* Associate Professors Kiefer* and Knight;* Assistant Professors Fullagar* and Lowman;* Emeriti: Professors Langford, Perkins, and Rohles.

Undergraduate study

The undergraduate program at Kansas State University is a versatile program composed of a core for all students. Beyond this common core, students may choose from several paths, depending upon their specific interests and goals.

The psychology curriculum is arranged with several functions in mind: to give students, as a part of a liberal education, some familiarity with the principles, methods, and findings of psychology; to provide knowledge and skills requisite for advanced study at the graduate level; to offer valuable background for students preparing to work in a variety of professions and jobs, such as medicine, law, theology, business, teaching, engineering, industry, and organizations; and to provide academic work that will prepare the students to pursue careers in psychology.

Core courses

The undergraduate major requires
STAT 330 and the following course work:

| | | |
|------------|------------------------------------|---|
| PSYCH 100* | Freshman Seminar | 1 |
| PSYCH 110 | General Psychology | 3 |
| PSYCH 200 | Junior Seminar in Psychology | 1 |
| PSYCH 350 | Experimental Methods in Psychology | 4 |

Two courses from:

| | | |
|---|--|----|
| PSYCH 460 | Cognitive Psychology | 3 |
| PSYCH 470 | Psychobiology | 3 |
| PSYCH 475 | Principles of Learning | 3 |
| PSYCH 480 | Fundamentals of Perception and Sensation | 3 |
| PSYCH 605 | Foundations of Social Behavior | 3 |
| or | | |
| PSYCH 620 | Psychology of Personality | 3 |
| Psychology electives (chosen with advisor consultation) | | 12 |

*Although not required, this course is strongly recommended for first-semester freshmen.

General education option

For students interested mainly in a liberal education, the core program will be sufficient. In consultation with the advisor, students may wish to choose several other psychology courses beyond the 33-hour requirement. Additional courses in the arts, sciences, or humanities should be chosen in line with the student's prevailing interests. For example, students interested in industrial relations should take relevant courses in economics, business administration, and sociology. There is great latitude for the student in this option. Beyond the 33 required hours, additional course work is entirely a discretionary matter.

Students interested in teaching or guidance-counseling in schools should prepare for teacher certification with a major in psychology. Such students must consult with advisors in the College of Education.

Graduate option

Pursuing an advanced degree in psychology requires, in addition to a strong grade point average and solid aptitude scores, a broad and basic education in psychology. Chances for successful application to graduate school will be enhanced through demonstration of a rigorous grounding in psychology.

Undergraduates who anticipate pursuing a Ph.D. in psychology should take the following courses (the core of 33 hours is contained within the following recommendations):

| | | |
|-----------|--|---|
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |
| MATH 501 | Introduction to Mathematics in the Behavioral Sciences | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS 201 | FORTRAN Language Laboratory | 2 |
| PSYCH 110 | General Psychology | 3 |
| PSYCH 350 | Experimental Methods in Psychology | 4 |
| PSYCH 460 | Cognitive Psychology | 3 |
| PSYCH 470 | Psychobiology | 3 |
| PSYCH 475 | Principles of Learning | 3 |

| | | |
|-----------|--|---|
| PSYCH 480 | Fundamentals of Perception and Sensation | 3 |
| PSYCH 505 | Abnormal Psychology | 3 |
| PSYCH 605 | Foundations of Social Behavior | 3 |
| PSYCH 620 | Psychology of Personality | 3 |
| PSYCH 775 | History of Current Trends | 3 |

Depending upon their more specialized goals, students may wish also to take PSYCH 560, 564, 580, 585, or others. Students oriented toward physiological psychology will want to ensure that they also have appropriate background in biology, chemistry, and other areas. These matters should be worked out in consultation with an advisor. It is also strongly recommended that students gain research experience by working on projects under faculty supervision.

Psychological technician option

A growing field for those with B.A. or B.S. degrees in psychology is that of the psychological technician. Such a person usually works in an applied setting and carries out duties that are supportive of the Ph.D. psychologist.

Technicians are playing an increasing role in both clinical-institutional and industrial/organizational settings. The academic requirements and, in particular, the field experience requirements will provide a background in human relations that a variety of employers in business, industry, and government should find attractive.

Because the psychological technician option is geared toward specific employment, the recommended courses are larger in number and there is more structure in this option.

The core of 33 hours is required for both the clinical and industrial emphasis. In addition, the following courses are required for the clinical emphasis:

| | | |
|-----------|---------------------------------------|-----|
| PSYCH 559 | Psychological Testing | 3 |
| PSYCH 505 | Abnormal Psychology | 3 |
| PSYCH 585 | Basic Concepts in Clinical Psychology | 3 |
| PSYCH 586 | Laboratory in Clinical Concepts | 2 |
| PSYCH 587 | Field Placement | 1-6 |

Four courses relevant to the mental health field.

For the industrial emphasis the following additional courses are required:

| | | |
|--|--|-----|
| PSYCH 559 | Psychological Testing | 3 |
| PSYCH 560 | Industrial Psychology | 3 |
| PSYCH 561 | Laboratory in Industrial Psychology I | 2 |
| PSYCH 562 | Laboratory in Industrial Psychology II | 2 |
| PSYCH 564 | Psychology of Organizations | 3 |
| PSYCH 587 | Field Placement | 1-6 |
| MANGT 530 | Industrial and Labor Relations | 3 |
| One computer science course with laboratory | | |
| One additional relevant course from business administration or elsewhere | | |

Other recommended courses for both the clinical and industrial emphases will depend on student interests and will be worked out in consultation with a psychological technician advisor. An integral part of both emphases is supervised field

experience in an applied setting. Arrangements for such experience will be worked out individually with each student regarding the exact number of hours for PSYCH 587, Field Placement, and the location (hospital, business or industry, government agency, research laboratory, other).

Graduate study

Professional training in psychology is obtained in graduate programs leading to the M.S. and Ph.D. degrees.

Doctoral programs are offered in several broad areas. These are: animal learning-physiological psychology (with concentration in animal learning and behavior or physiological psychology/behavioral neuroscience); information processing (with concentration in human learning and memory, psycholinguistics, human judgment, human factors, or perception-sensation); social-personality (with concentration in social psychology, personality, or developmental psychology); and industrial/organizational psychology.

At the master's level, students may specialize in most of the traditional areas of psychology. Although primary emphasis is on work leading to the doctoral degree, a structured, terminal degree is offered in industrial/organizational psychology. Students who complete the doctoral program are eligible for a variety of positions, including teaching and research positions in colleges and universities, governmental agencies, and industry.

For most students, the master's program requires two years beyond the bachelor's level; the doctorate requires two more years. Prerequisites to admission into the graduate program are a superior academic record and background work essentially equivalent to the undergraduate psychology degree at KSU, especially courses in experimental psychology and statistics. In some cases, deficiencies in preparation may be made up after admission to the program.

A detailed description of the graduate programs, as well as information about financial support, may be obtained by writing to the director of graduate studies in the department.

Courses in psychology

PSYCH 100. Freshman Seminar. (1) 1. An orientation and introduction to the field of psychology for freshman psychology majors only. Additional emphasis on the means by which psychological principles can be used to adapt to college life. PSYCH-100-0-2001

PSYCH 110. General Psychology. (3) 1, 11, S. An introductory survey of the general content areas of psychology, including methods, data, and principles. PSYCH-110-0-2001

PSYCH 115. General Psychology (Honors). (4) 1, 11. An introductory survey of the general content areas of psychology, including methods, data, and principles. PSYCH-115-0-2001

PSYCH 200. Junior Seminar in Psychology. (1) I. Discussion of professional, research, and educational methods and objectives in psychology. Acquaints psychology majors with psychology as a profession, and with the various options available to them at various levels of training. Should be taken during first semester of junior year. Pr.: Junior standing. PSYCH-200-0-2001

PSYCH 202. Drugs and Behavior. (2) 1, S. Effects of drugs on human performance, cognition, and physiological processes will be discussed and the empirical evidence surveyed and critically evaluated in relation to both use and abuse of drugs in society. Pr.: PSYCH 110. PSYCH-202-0-2001

PSYCH 280. Psychology of Childhood and Adolescence. (3) 1, 11. Survey of behavioral development from birth through adolescence. Pr.: PSYCH 110. PSYCH-280-0-1009

PSYCH 290. Innovative Studies in Psychology. (1-6) 1, 11. Topics selected in consultation with the instructor. To be used for interdisciplinary and innovative approaches to psychological topics. Pr.: Consent of instructor. PSYCH-290-2-2001

PSYCH 350. Experimental Methods in Psychology. (4) 1, 11. Laboratory investigation of learning, motivation, social-personality processes, and perception and sensation. Includes two hours rec. and four hours lab a week. Pr.: PSYCH 110. PSYCH-350-1-2002

PSYCH 399. Honors Seminar in Psychology. (3) 11. Selected topics. Open to nonmajors in the honors program. PSYCH-399-0-4900

PSYCH 400. Practicum in Teaching Psychology. (1-4) 1, 11. Supervised experience in presentation of psychological concepts in various classes. May be taken only with approval of the instructor of a general psychology class under whose supervision the student will obtain this experience. Pr.: Nine hours of psychology including PSYCH 110; junior standing; consent of instructor. PSYCH-400-2-2001

PSYCH 425. Problem Solving and Decision Making. (3) 11. Provides both the psychological background and practical aids to help solve problems in everyday decision making. Skills to be covered include creativity, methods of problem solving, memory aids, decision-making tools, avoiding biases of judgment, etc. Pr.: PSYCH 110. PSYCH-425-0-2099

PSYCH 450. Applications of Memory. (3) 11. Examination of the applications of memory in such diverse areas as courtroom testimony, expert performance, mnemonic procedures, and advertising. Relevant theories and research in each area are examined. Pr.: PSYCH 110. PSYCH-450-0-2002

PSYCH 460. Cognitive Psychology. (3) 1, 11. A survey of the manner in which people extract and use relevant information from their environment as a basis for behavior. Topics may include memory storage and retrieval, attention, imagery, mnemonic devices, decision making, and other cognitive processes. Pr.: PSYCH 350. PSYCH-460-0-2002

PSYCH 470. Psychobiology. (3) 1, 11. Behavior from a biological point of view. Topics include: behavioral neuroscience techniques, sensory coding, food and water intake, sexual behavior, sleep and waking, memory, and learning. Pr.: BIOL 198, PSYCH 110. PSYCH-470-0-2010

PSYCH 475. Principles of Learning. (3) 1, 11. Introduction to the principles of learning and their relevance to the understanding of the behavior of animals and humans. Pr.: PSYCH 350. PSYCH-475-0-2002

PSYCH 480. Fundamentals of Perception and Sensation. (3) 1, 11. Empirical and theoretical approaches to phenomena of sensation and perception. Pr.: PSYCH 350. PSYCH-480-0-2002

PSYCH 490. Honors Tutorial in Psychology. (1-3) 1, 11. Individual directed research and study of a topic in psychology, normally as a preliminary to writing a senior honors thesis. May be repeated once to a total of 3 hours. Pr.: Sophomore standing, membership in the

honors program of the College of Arts and Sciences, and permission of instructor. PSYCH-490-3-2000

PSYCH 499. Senior Honors Thesis. (2) 1, 11, S. Open only to seniors in the arts and sciences honors program. PSYCH-499-4-2000

Undergraduate and graduate credit in minor field

PSYCH 505. Abnormal Psychology. (3) 1, 11, S. An introductory study of behavior pathologies, with emphasis on their etiology and treatment. Pr.: Junior standing; PSYCH 110. PSYCH-505-0-2099

PSYCH 510. Introduction to Behavior Modification. (3) 11. Study of the principles of behavior modification and applications to human behavior. Emphasis on the learning principles and research in behavior modification. Pr.: PSYCH 505. PSYCH-510-0-2003

PSYCH 518. Introduction to Health Psychology. (3) 11. Psychosocial factors relevant to general health maintenance, recovery from disease or injury, and the achievement of health. Topics include stress-management techniques, personality characteristics associated with disease, cognitive-emotional effects of diet and exercise, and theories of pain and pain management. Concepts of prevention and behavioral medicine are also included. Pr.: PSYCH 110. PSYCH-518-0-2003

PSYCH 520. Life Span Personality Development. (3) 1, 11, S. Theories and research in the development of personality from infancy through old age. Origins of personality in heredity and early experience, socialization practices, life crises and choices at various stages throughout life, and problems of aging. Pr.: PSYCH 110; sophomore standing. PSYCH-520-0-2009

PSYCH 530. Psychology of Mass Communications. (3) 11. The psychological effects of mass communication on behavior and thought, including advertising, stereotyping of women and minorities, effects on children, violence and sex in the media, effects of news on behavior, and the promotion of prosocial behavior through the media. Pr.: PSYCH 110. PSYCH-530-0-2005

PSYCH 535. Social Psychology. (3) 1, 11. Psychology of the individual in society. Survey of empirical studies and theoretical models of social perception, attitudes, and social behavior (e.g., attribution, ethnic and gender prejudice, conformity). Relationship of these topics to personal and media influence, social mores, and social systems is also included. Pr.: PSYCH 110. PSYCH-535-0-2099

PSYCH 540. Psychology of Women. (3) 11. Investigation of psychological processes of women. A developmental sequence with emphasis on major life events for women. Female physiology, early socialization into sex roles, friendship, achievement motivation, sexuality, marriage, childbearing, work, and mental health. Pr.: PSYCH 110. PSYCH-540-0-2099

PSYCH 543. Women's Mental Health Issues. (3) 11. Investigates prevalent women's mental health issues such as incidence of depression/anxiety, eating disorders, sexuality, relationship concerns. Also covers the efficacy of traditional treatment modalities and newer therapies that target women's unique mental health needs such as feminist or nonsexist therapies. Pr.: PSYCH 505. PSYCH-543-0-2099

PSYCH 545. Consumer Psychology. (3) 1. Survey of psychological principles and facts in perception, learning, attitude formation, personality, etc., as they apply to behavior of consumers. Pr.: PSYCH 110 and junior standing. PSYCH-545-0-2008

PSYCH 550. Group Dynamics. (3) 11. Interaction in small groups: interpersonal sensitivity, communication, decision making, development of group structure and norms. May be organized as laboratory "process" group and require some flexibility in scheduling. Pr.: Six hours in psychology. PSYCH-550-0-2005

PSYCH 558. Varieties of Consciousness. (3) 1, S. Traditional and contemporary approaches of both Western science and Eastern metaphysics to study of ordinary mind consciousness, unusual states of awareness, and efforts to expand the powers of mind. Topics include sleep, dreaming, biofeedback, meditation, psychoactive drugs, brain area dominance, and other factors influencing relationships. Pr.: PSYCH 110. PSYCH-558-0-2099

PSYCH 559. Psychological Testing. (3) 11. Principles of psychological testing in industrial, clinical/counseling, and research environments. Topics include technical issues such as reliability, validity, norming, selection, placement, discrimination, etc. Also covers procedures for selecting, administering, and interpreting psychological tests. Pr.: PSYCH 110. PSYCH-559-0-2006

PSYCH 560. Industrial Psychology. (3) 1, S. Survey of human behavior and psychological principles in an industrial/personnel context. Topics include: recruiting, selecting, and training personnel; evaluating their job performance; conducting job analyses; and implementing compensation strategies. Pr.: PSYCH 110. PSYCH-560-0-2008

PSYCH 561. Laboratory in Industrial Psychology I. (2) 1. Supervised experience in personnel psychology including classifications, analysis, and evaluation of jobs. Pr.: PSYCH 560 or conc. enrollment. PSYCH-561-1-2008

PSYCH 562. Laboratory in Industrial Psychology II. (2) 11. Additional supervised experience in personnel psychology including interviewing, EEOC regulations, training, and performance appraisal. Pr.: PSYCH 561. PSYCH-562-1-2008

PSYCH 563. Gender Issues in the Workplace. (3) 1. Psychological experiences of women and men in the world of work, with emphasis on traditional and nontraditional sex-role behavior, sexual discrimination and harassment, and relevant socialization experiences. Pr.: PSYCH 110. PSYCH-563-0-2008

PSYCH 564. Psychology of Organizations. (3) 11. Relationships between individuals, groups, and organizations. How organizational factors contribute to individual behavior, and how individuals affect groups and organizational functioning. Emphasis is on such traditional topics as work motivation, job satisfaction and other attitudes, leadership, communication, socialization, and organization and job design. Pr.: PSYCH 110. PSYCH-564-0-2008

PSYCH 580. Psychology of Sexual Behavior. (3) 1, 11. Study of psychological determinants and consequences of human sexual behavior; roles of personality, attitudinal and emotional factors will be emphasized. Pr.: PSYCH 110. sophomore standing. PSYCH-580-0-2005

PSYCH 585. Basic Concepts in Clinical Psychology. (3) 1. Critical analysis of the profession. Review of theoretical and empirical bases of such areas as intelligence and its measurement, personality and diagnosis, psychotherapy, and other modes of behavioral change. Pr.: PSYCH 110, 505, and 3 additional hours of psychology. PSYCH-585-0-2003

PSYCH 586. Laboratory in Clinical Concepts. (2) 1. May be taken only in conjunction with PSYCH 585. Supervised practice in demonstration of, and orientation to selected psychological techniques and practices. Pr.: Conc. enrollment in PSYCH 585. PSYCH-586-1-2003

PSYCH 587. Field Placement. (1-6) 1, 11, S. Supervised field experience in an agency or institutional setting in the application of psychological techniques to individuals, groups, or organizations. Regular supervision emphasizes relationship between theory and application and the evaluation of outcomes. Pr.: PSYCH 585 and 586, or 560 and 561 and consent of psychological technician training committee. PSYCH-587-2-2003

PSYCH 599. Problems in Psychology. (Var.) 1, 11, S. Investigation of selected problems. Pr.: PSYCH 110 and consent of instructor. PSYCH-599-3-2001

Undergraduate and graduate credit

PSYCH 605. Foundations of Social Behavior. (3) II.

Analysis of fundamental psychosocial processes underlying selected problems in contemporary society (e.g., effects on personality and interpersonal relations of changing sex roles, technological innovations, and historical events). Pr.: PSYCH 535 and either PSYCH 460, 475, or 480. PSYCH-605-0-2005

PSYCH 620. Psychology of Personality. (3) I.

Discussion of different approaches to the study of personality. Pr.: PSYCH 350. PSYCH-620-0-2099

PSYCH 625. Engineering Psychology. (3) I. The role of behavioral factors in the design and operation of machines and equipment. Pr.: PSYCH 110, STAT 330, or 707. PSYCH-625-0-2008

PSYCH 630. Human Neuropsychology. (3) II. Study of brain-behavior relationships in humans. Brief review of human neuroanatomy followed by a major emphasis on brain function in learning, memory, language, and other cognitive behaviors. Also includes an examination of behavioral alterations following brain damage. Pr.: BIOL 198 and PSYCH 110, or consent of instructor. PSYCH-630-0-2010

PSYCH 650. Psychology of Language. (3) I.

Experimental study of language, including sentence comprehension and memory, language acquisition and development, speech perception, and effects of context, perception, reasoning, and linguistic structure on processing of language. Pr.: PSYCH 110 and junior standing. PSYCH-650-0-2002

PSYCH 715. Psychology of Aging. (3) II. The psychological aspects of human aging. An analysis of the contributions of experimental, developmental, and personality-social psychology to the study of aging. The psychopathology of aging and psychological intervention strategies are also covered. Pr.: PSYCH 110 or DAS 315 and junior standing. PSYCH-715-0-2009

PSYCH 775. History of Current Trends. (3) II. A review of the contributions of individuals and intellectual movements to the development of modern psychology. A survey of theoretical systems currently of influence. Pr.: PSYCH 110 and 9 additional hours of psychology; senior standing. PSYCH-775-0-2001

PSYCH 790. Topics in Psychology. (Var.) I, II, S. Pr.: PSYCH 110 and consent of instructor. PSYCH-790-3-2001

PSYCH 799. Problems in Psychology. (Var.) I, II, S. Pr.: PSYCH 110 and consent of instructor. PSYCH-799-3-2001

Graduate credit

PSYCH 801. Logic and Methods of Psychology. (3)

Methods of psychological research including general scientific and theoretical problems. Emphasis on methods of empirical investigation in such representative areas as learning, motivation, perception, and personality-social. Pr.: PSYCH 350 or equiv. PSYCH-801-0-2002

PSYCH 802. Quantitative Methods in Psychology. (3)

I. Examination of the nature of statistical inference in psychological research: hypothesis testing and statistical estimation, including a survey of nonparametric methods; consideration of correlational techniques useful with different kinds of psychological data. Pr.: STAT 330 or equiv. PSYCH-802-0-2007

PSYCH 803. Physiological Psychology. (3) I.

An advanced survey of basic technique, theory, and research in the field of behavioral neuroscience, including memory and learning, sensory and motor processes, motivation, and sexual behavior. Pr.: BIOL 198 and PSYCH 110. PSYCH-803-0-2010

PSYCH 804. Industrial/Organizational Psychology. (3)

I. Advanced survey of theory and research pertaining to human behavior in work organizations. Topics include selection, training, and evaluation of employees, job analysis and evaluation, work motivation and satisfaction, organizational structure and development, and working conditions. Pr.: PSYCH 560 or 564. PSYCH-804-0-2008

PSYCH 805. Experimental Design in Psychology. (3)

II. Introduction to techniques of research planning and experimental design, including critical evaluation of selected experiments. Pr.: PSYCH 802. PSYCH-805-0-2007

PSYCH 806. Psychological Measurement. (3) I.

The logic and methodology underlying the construction of psychological measuring instruments from the psychophysical estimate of threshold to the scaling of complex psychological variables. Pr.: PSYCH 110 and STAT 330. PSYCH-806-0-2006

PSYCH 810. Learning. (3) II.

In-depth study of empirical and theoretical research on basic learning principles and their effects on behavior. Pr.: PSYCH 350 or equiv. PSYCH-810-0-2002

PSYCH 812. Perception. (3) II.

Various systematic approaches to perception, with emphasis on experimental and quantitative data. The role of perception in affectivity, motivation, and personality theory is stressed. Pr.: PSYCH 350 or equiv. PSYCH-812-0-2002

PSYCH 814. Advanced Cognitive Psychology. (3) I.

Study of contemporary trends and research in cognition, including memory, language, problem solving, decision making, and human learning. Pr.: PSYCH 350 or equiv. PSYCH-814-0-2002

PSYCH 820. Personality Theory and Research. (3) II.

A comparative examination of contemporary theories of personality as well as research findings relevant to such theories. Pr.: PSYCH 620 or equiv. PSYCH-820-0-2099

PSYCH 825. Judgmental Processes. (3) I.

Examination of empirical findings and theoretical approaches to decision making and judgment with emphasis on higher cognitive processes. Pr.: PSYCH 350 and 802. PSYCH-825-0-2002

PSYCH 830. Pro-Seminar in Social Psychology. (3) I.

Discussion of empirical findings and theoretical approaches to selected problem areas, such as attitude change, personality and social structure, person perception, small group processes. Pr.: PSYCH 535. PSYCH-830-0-2005

PSYCH 860. Practicum in Psychology. (Var.) I, II, S.

Supervised practical experience in applied psychology. Pr.: Consent of instructor. PSYCH-860-2-2004

PSYCH 870. Practicum in Teaching Psychology. (1-4)

I, II. Supervised experience regularly teaching a college psychology course. Pr.: Consent of instructor. PSYCH-870-2-2099

PSYCH 875. Industrial Psychology: Personnel

Training. (3) II. An examination of the training of personnel in an organization. Topics include: determination of an organization's training needs, selection and motivation of trainees, design and evaluation of training programs, and examination of several specific strategies for accomplishing the training function. Pr.: PSYCH 560 or equiv. PSYCH-875-0-2008

PSYCH 876. Industrial Psychology: Work Motivation. (3) I.

An examination of empirical findings and theoretical approaches to understanding the relationship between worker motivation and job outcomes. Pr.: PSYCH 560 or GENBA 520. PSYCH-876-0-2008

PSYCH 877. Industrial Psychology: Leadership. (3) I.

Examination of current leadership theories, research, and practice in the work setting, focusing on situational approaches to leadership, leadership styles, and interactions between personal characteristics and organizational factors. Pr.: PSYCH 560 or equiv. PSYCH-877-0-2008

PSYCH 878. Industrial Psychology: Personnel

Selection. (3) II. Examination of theoretical and practical issues in staffing industrial organizations, including recruitment, test validation, and other equal employment opportunity issues (test fairness, adverse impact, etc.). Pr.: PSYCH 560 or equiv. PSYCH-878-0-2008

PSYCH 879. Organizational Psychology. (3) I.

An examination of the individual's role in industrial organizations and the effects of organizational variables on the individual worker. Topics include organizational communication, employee socialization, psychological climates of organizations, psychological stress in organizations, group processes and employee performance, and organizational change. Pr.: PSYCH 560. PSYCH-879-0-2008

PSYCH 880. Industrial Psychology: Performance

Appraisal. (3) II. Examination of data sources, rating procedures, psychometric criteria for evaluating performance appraisal systems, and models/theories of the performance evaluation process. Pr.: PSYCH 560 or equiv. PSYCH-880-0-2008

PSYCH 899. Master's Research in Psychology. (Var.)

I, II, S. Pr.: Consent of supervisory committee. PSYCH-899-4-2001

PSYCH 922. Psychopathology. (3) I.

A systematic review of behavior disorders, their etiology and treatment. Pr.: PSYCH 505 and 620. PSYCH-922-0-2099

PSYCH 951. Seminar in Physiological Psychology.

(1-3) Selected topics in physiological psychology. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. PSYCH-951-0-2010

PSYCH 952. Seminar in Sensory Processes. (1-3)

Selected topics in sensory psychology. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. PSYCH-952-0-2002

PSYCH 953. Seminar in Personality. (1-3)

Intensive discussion of current problems of theoretical and empirical interest in the field of personality. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. PSYCH-953-0-2099

PSYCH 954. Seminar in Experimental Psychology.

(Var.) Intensive discussion of a problem of current interest based on the class's study of the pertinent original literature. May be repeated with consent of supervisory committee. Pr.: PSYCH 810 or consent of instructor. PSYCH-954-0-2002

PSYCH 956. Seminar in Psychological Measurement.

(Var.) Intensive discussion of a problem of current interest, based on the class's study of the pertinent original literature. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. PSYCH-956-0-2006

PSYCH 957. Seminar in Cognitive Processes. (1-3)

Selected topics in the study of human thinking and cognition. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. PSYCH-957-0-2002

PSYCH 958. Seminar in Mathematical Models of

Behavior. (1-3) Selected topics in mathematical psychology, and applications of mathematical models to behavior. May be repeated with consent of supervisory committee. Pr.: MATH 501 and consent of instructor. PSYCH-958-2-2001

PSYCH 959. Seminar in Social Psychology. (1-3)

Emphasis on discussion of advanced topics of current interest in social psychology. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. PSYCH-959-0-2005

PSYCH 960. Seminar in Industrial Psychology. (3) I.

Intensive examination of current empirical and theoretical issues in industrial and organizational psychology. May be repeated with consent of supervisory committee. Pr.: PSYCH 560 or equiv. PSYCH-960-0-2008

PSYCH 968. Seminar in Professional Problems. (1-3)

Intensive study and discussion of current professional problems in psychology. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. PSYCH-968-0-2001

PSYCH 990. Internship in Psychology. (Var.) I, II, S.

Pr.: Consent of the supervisory committee. PSYCH-990-2-2001

PSYCH 999. Ph.D. Research in Psychology. (Var.) I, 11, S. Pr.: Consent of supervisory committee. PSYCH-999-4-2001

Sociology, Anthropology, and Social Work

Martin S. Ottenheimer,* Head

Professor Finnegan, O'Brien, H. Ottenheimer, Peters; Associate Professors Adamchak,* Benson, Camp,* Dushkin,* Frey,* Kaiser,* Orbach,* and Roncek;* Assistant Professors Bloomquist,* Brede,* Denning, Gibbons, Harper, Huff-Corzine,* Miley,* Miller,* Verschelden, and Ward.

The Department of Sociology, Anthropology, and Social Work offers three separate undergraduate majors: sociology; anthropology; and social work. The sociology major has two options, sociology, and society and criminal justice. The student may enroll in a B.S. or B.A. program in any of these major areas. Graduate-level work is offered in sociology only. The department offers an M.A. and a Ph.D. in general sociology with emphasis in rural development.

Anthropology is listed alphabetically with the College of Arts and Sciences.

Sociology

Sociology is the study of society and of social relationships. Some of the principal areas considered are social and community organization, the development and interaction of individuals in society, major social institutions, social problems and deviant behavior, population growth and distribution, and social change and development.

Sociology is a desirable background, as either a sole or a combined major, for further professional training in law, city planning, public administration, hospital administration, and medicine, as well as for advanced graduate work in sociology or other of the social sciences.

Undergraduate study

Students who desire to major in sociology should refer to the general requirements for the B.A. or B.S. degree earlier in the College of Arts and Sciences section. The student interested in sociology who desires to teach in secondary schools should prepare for teacher certification with a major in sociology (see the College of Education section of this catalog).

Students enrolled in sociology will be required to complete 6 hours of tool and related courses, 16 hours of required core

sociology requirements, and 15 hours of sociology electives at the 500 level or above.

Tool and related courses (6 hours)

| | | |
|----------|--|---|
| CIS 110 | Introduction to Personal Computing (or demonstration of equivalent competencies) | 3 |
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |

Sociology core requirements (16 hours)

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|-----------|--|---|
| SOCIO 211 | Introduction to Sociology | 3 |
| SOCIO 511 | Comparative Social Theories | 3 |
| SOCIO 520 | Methods of Social Research I | 4 |
| SOCIO 540 | Social Organization | 3 |
| SOCIO 550 | Introduction to Social Interaction | 3 |

Sociology electives (15 hours)

| | |
|---|----|
| Sociology electives at the 500 level or above | 15 |
|---|----|

Graduate study

The graduate programs in sociology provide the student with the opportunity to develop specific skills and interests while obtaining a solid grounding in basic substantive areas of sociology. They offer a high level of student-faculty interaction and the opportunity to participate in supervised research.

The general master's program offers a range of sociological specialties and a broad sociological background. The master's program offers two options: thesis and nonthesis. This gives the student the opportunity to develop a program of study to meet career goals. Students who wish to pursue a Ph.D. and a career in an academic environment are encouraged to pursue the thesis option. Those interested in applied research careers have the option of pursuing the nonthesis program.

The Ph.D. program offers specialized training in community organization, societal change and development, demography and human ecology, social organization, gerontology, and social psychology. In addition, students are required to take course work in the core areas of sociological theory and research methodology.

Sociology students may draw upon related graduate programs in computer science, statistics, and various social and behavioral sciences in designing programs of study. Special University programs in the economics of development, regional and community studies, South Asia studies, gerontology, American ethnic studies, and women's studies and the Kansas Center for Rural Initiatives may be relevant for specific objectives. A computing center with a full range of facilities and services is available to graduate students. Research facilities in the Department of Sociology, Anthropology, and Social Work include a population research laboratory, a micro-computer laboratory, and a departmental library.

Society and criminal justice

The society and criminal justice option is a liberal arts program of study that provides students with a broad knowledge of the

workings of all agencies and organizations that make up the criminal justice system. The option is intended primarily for students who anticipate careers in the criminal justice system, including law enforcement, correctional institutions, court services, probation, and parole.

Students will take core courses in sociology that acquaint them with the nature and extent of crime in society, police missions and crime control, the function of law, court organization and process, prison and its alternatives, and parole and subsequent re-entry into society. In addition, students will also take relevant course work in other social and behavioral sciences.

A semester-length supervised internship is also required, providing students with direct personal experiences in working with offenders in various agencies within the criminal justice system.

Students who wish to pursue the society and criminal justice option should refer to the general requirements for the B.A. or B.S. degree in the College of Arts and Sciences section. Students are required to complete 18 hours of tool and related courses, 34 hours of core sociology courses, and 12 hours of supervised internship and professional seminar courses.

Tool and related courses (18 hours)

| | | |
|--------------------------------------|--|---|
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |
| PSYCH 110 | General Psychology | 3 |
| POLSC 325 | U.S. Politics | 3 |
| SOCWK 560 | Skills and Techniques in the Practice of Social Work I | 3 |
| Psychology elective | 3 | |
| Political science elective | 3 | |

Major courses (34 hours)

| | | |
|-----------|--|---|
| SOCIO 211 | Introduction to Sociology | 3 |
| SOCIO 361 | Sociology of Criminal Justice | 3 |
| SOCIO 362 | Police and Society | 3 |
| SOCIO 511 | Comparative Social Theories | 3 |
| SOCIO 520 | Methods of Social Research I | 4 |
| SOCIO 532 | Community Organization and Leadership | 3 |
| SOCIO 550 | Introduction to Social Interaction | 3 |
| SOCIO 560 | Juvenile Delinquency | 3 |
| SOCIO 561 | Criminology | 3 |
| SOCIO 663 | The Prison and Other Correctional Institutions | 3 |
| SOCIO 664 | Community Corrections | 3 |

Professional field experience (Required—12 hours)

| | | |
|-----------|---|---|
| SOCIO 568 | Society and Criminal Justice Internship | 9 |
| SOCIO 569 | Society and Criminal Justice Professional Seminar | 3 |

Courses in sociology

Undergraduate credit

SOCIO 211. Introduction to Sociology. (3) 1, 11, S. Development, structure, and functioning of human groups; social and cultural patterns; and the principal social processes. SOCIO-211-0-2208

SOCIO 214. Introduction to Sociology, Honors. (4) 1, 11. Development, structure, and functioning of human groups; societal and cultural patterns; the nature of sociological inquiry. Lecture, discussion, and independent study. SOCIO-214-0-2208

SOCIO 301. Topics in Sociology. (3) I, II, S.

Supervised independent and/or interdisciplinary study projects. Pr.: SOCIO 211 and consent of instructor. SOCIO-301-0-2208

SOCIO 360. Social Problems. (3) I, II. Analysis of social problems such as drug use, crime, juvenile delinquency, mental illness, unemployment, and family instability. Pr.: SOCIO 211. SOCIO-360-0-2208

SOCIO 361. Sociology of the Criminal Justice System. (3) II. General introduction to the field, examining all agencies and organizations that collectively make up the criminal justice system. Pr.: SOCIO 211. SOCIO-361-0-2208

SOCIO 362. Police and Society. (3) I. Examines in detail the policing function in society and the role police play in the criminal justice process. Pr.: SOCIO 211. SOCIO-362-0-2208

SOCIO 399. Honors Seminar in Sociology. (1-3) I. On sufficient demand. Readings and discussion of selected topics. Open to nonmajors in the honors program. SOCIO-399-3-4900

SOCIO 435. Sport and Contemporary Society. (3) II. An analysis of sport and its role in contemporary society. Course creates a greater awareness of the social significance of sport in society and fosters the capacity to use critical thinking in the analysis of significant sport issues. Same as PE 435. Pr.: SOCIO 211. SOCIO-435-0-2208

SOCIO 499. Senior Honors Thesis. (2) On sufficient demand. Open only to seniors in the arts and sciences honors program. SOCIO-499-4-2208

Undergraduate and graduate credit in minor field

SOCIO 500. Sociological Perspectives on Contemporary Issues. (3) I, II. Analysis of a selected topic of contemporary interest. Topics vary from semester to semester and might include: impact of public policy on rural life; white collar crime; student-athlete education; social change in the Third World. Pr.: SOCIO 211. SOCIO-500-0-2208

SOCIO 501. Proficiency Development. (1-3) Integrative review of sociological concepts and skills under faculty supervision. For single students or groups of students. Not applicable to major field requirements. Not repeatable. For undergraduate credit only. Pr.: Consent of instructor and superior performance in relevant course. SOCIO-501-0-2208

SOCIO 504. Political Sociology. (3) II, in even years. An introduction to the principles of political sociology. Processes of political socialization, participation within and outside established organizational channels, recruitment of elites, communication and influence, power, decision making, and policy outputs. Data are presented from a cross-national perspective. Same as POLSC 504. Pr.: SOCIO 211, POLSC 110. SOCIO-504-0-2208

SOCIO 505. Introduction to the Civilizations of South Asia I. (3) I. Interdisciplinary survey of the development of civilizations in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan; geographical and demographic context; philosophical and social concepts; social and political institutions; literature; and historical movements. Same as HIST 505, ECON 505, POLSC 505, ANTH 505, GEOG 505. Pr.: SOCIO 211. SOCIO-505-0-2208

SOCIO 506. Introduction to the Civilizations of South Asia II. (3) II. Interdisciplinary survey of recent and contemporary civilizations in India, Pakistan, Sri Lanka, Bangladesh, and Afghanistan, including literature, geography, social and political structure, ideas. Same as HIST 506, ECON 506, POLSC 506, ANTH 506, GEOG 506. Pr.: SOCIO 211. SOCIO-506-0-2208

SOCIO 510. Social Welfare as a Social Institution. (3) I, II. The development and present status of social welfare in meeting changing human needs and the requirements in other parts of our social system; the

analysis of present-day philosophy and functions of social welfare. Same as SOCWK 510. Pr.: SOCIO 211. SOCIO-510-0-2208

SOCIO 511. Comparative Social Theories. (3) I, II. Investigations of a range of current sociological theories concerning the socialization process, group behavior, and social organization. Pr.: SOCIO 211. SOCIO-511-0-2208

SOCIO 520. Methods of Social Research I. (4) I, II. Treatment of the logic and procedures involved in the formulation of a research problem and the difficulties encountered in conducting research. Examines problems of explanation and prediction, the process of inquiry, elements of the scientific method, the design of research, and analysis in the social sciences. Pr.: SOCIO 211, STAT 330 or equiv. To include 1 credit hour of lab and field research experience. SOCIO-520-1-2208

SOCIO 530. Population and Human Ecology. (3) II. Theories, policies, growth, composition, spatial aspects, movements, and world population trends. Pr.: SOCIO 211. SOCIO-530-0-2208

SOCIO 531. Urban Sociology. (3) II. Growth, development, and structure of the city as determined by geographical, ecological, and social factors; relation of rural and urban communities; problems of the city and various approaches to their solution. Pr.: SOCIO 211. SOCIO-531-0-2208

SOCIO 532. Community Organization and Leadership. (3) I, II. The analysis of community organization and change in American communities, with special emphasis on nonmetropolitan places. Issues include the analysis of internal community organizational ties, the interaction between the local community and its external environment, and the exploration of various methods affecting community development and social change within communities. Pr.: SOCIO 211. SOCIO-532-0-2208

SOCIO 533. Rural Society. (3) I. A survey of U.S. rural society, including change in agricultural structure, rural demographic shifts, growth of the rural service sector, rural class structure, decline and transformation of rural communities, and linkages to urban society. Examination of selected rural institutions such as education and religion. Pr.: SOCIO 211 or consent of instructor. SOCIO-533-0-2208

SOCIO 540. Social Organization. (3) II. Principles and processes of the organization and structure of human societies. Analysis of social groups and institutions and theories of social structure. Pr.: SOCIO 211. SOCIO-540-0-2208

SOCIO 541. Wealth, Power, and Privilege. (3) II. Distribution of resources and rewards in American society. Various explanations of the causes, persistence, and effects of inequality in American life. Discussion of social mobility and current issues. Pr.: SOCIO 211. SOCIO-541-0-2208

SOCIO 542. The Social Organization of the Future. (3) On sufficient demand. Examination of alternative social arrangements presented in speculative and science fiction. Consideration of fictional extrapolations of social, scientific, and technological trends in terms of specific institutions. Analysis of possible social and interpersonal structures imaginatively conceived. Pr.: SOCIO 211. SOCIO-542-0-2208

SOCIO 545. The Sociology of Women. (3) I. The positions of women in the United States and cross-culturally are studied in order to understand what women and girls do and how that is perceived and responded to by different groups. Pr.: SOCIO 211. SOCIO-545-0-2208

SOCIO 546. Bureaucracy in Modern Societies. (3) I. The nature and types of bureaucratic organizations in modern societies. Selected aspects of their internal structure, such as peer group and hierarchical relations in organizations, processes of communication, management, and impersonal mechanisms of control. Pr.: SOCIO 211. SOCIO-546-0-2208

SOCIO 550. Introduction to Social Interaction. (3) I. A survey of theories of social interaction and social psychology with special attention to research on principles of interpersonal relations in social situations, group formation, maintenance, and change. Pr.: SOCIO 211. SOCIO-550-0-2208

SOCIO 560. Juvenile Delinquency. (3) I, II, S. Nature, extent, and causes of delinquency; characteristics of delinquents; means of prevention and treatment. Pr.: SOCIO 211. SOCIO-560-0-2209

SOCIO 561. Criminology. (3) I, II. Nature, extent, and causes of crime; programs for prevention and treatment. Pr.: SOCIO 211. SOCIO-561-0-2209

SOCIO 565. Program and Policy Formulation and Analysis. (3) I, II. Examination of policies and programs developed to cope with various social problems. Emphasis will be on analysis of existing programs and policies and the formulation of alternative policies. Attention will be given to policy change through legislative action. Same as SOCWK 565. Pr.: SOCIO 260, 510. SOCIO-565-0-2104

SOCIO 568. Society and Criminal Justice Internship. (9) I, II, S. Supervised field experience in various agencies within the criminal justice system. To be taken concurrently with SOCIO 569. Pr.: SOCWK 560. Society and criminal justice option students only. SOCIO-568-2-2105

SOCIO 569. Society and Criminal Justice Professional Seminar. (3) I, II, S. Integrates field experience and everyday practices in working with offenders in the criminal justice system with sociological theory. To be taken concurrently with SOCIO 568. Pr.: SOCWK 560. Society and criminal justice option students only. SOCIO-569-0-2105

SOCIO 570. Race and Ethnic Relations in the U.S.A. (3) I, II. This survey of racial and ethnic relations focuses on discrimination and conflict now as well as on background factors of the past to enlarge understanding of dominant and minority groups. Pr.: SOCIO 211. SOCIO-570-0-2208

Undergraduate and graduate credit

SOCIO 618. Religion in Culture. (3) II, in odd years. The nature of religion and its manifestations in different cultural systems. Same as ANTH 618. Pr.: ANTH 200 or SOCIO 211. SOCIO-618-0-2208

SOCIO 633. Gender, Power, and Development. (3) II, in even years. Examination of various models of development and their impact on roles of women and men in various cultures. Emphasis upon Africa, Asia, and Latin America. Comparisons of public, service, and economic sectors, including agriculture, marketing, and industry. Examination of policy issues. Pr.: SOCIO 211 or ANTH 200 and 3 additional hours in sociology or cultural anthropology. Same as ANTH 633. SOCIO-633-0-2208

SOCIO 640. Sociology of the Family. (3) I. Origin and development of marriage customs and systems of family organizations; the preparation for family life under present conditions. Pr.: SOCIO 211. SOCIO-640-0-2208

SOCIO 643. Sociology of Religion. (3) I. On sufficient demand. The role of religion as an institution in American society. An assessment of the functions of religion and an exploration of contemporary trends and movements, including information on traditional denominations and emerging sects and cults. Pr.: SOCIO 211. SOCIO-643-0-2208

SOCIO 647. Sociology of Work. (3) II. The social nature of work and related phenomena; occupational structures; career lines; adjustment and interpersonal relations at work; significance of work in the life cycle. Pr.: SOCIO 211. SOCIO-647-0-2208

SOCIO 663. The Prison and Other Correctional Institutions. (3) I. Correctional confinement facilities for offenders of all ages. Includes management of offenders for classification, training, and treatment, and for security, custody, and discipline. Pr.: SOCIO 211. SOCIO-663-0-2105

SOCIO 664. Community Corrections. (3) I. Alternatives to prison such as fines, restitution, nonresidential treatment centers, community correction centers, probation, residential treatment, half-way houses, correctional field service, parole, furloughs, and work release. Pr.: SOCIO 211. SOCIO-664-0-2105

Undergraduate and graduate credit

SOCIO 701. Problems in Sociology. (Var.) I, II, S. Pr.: SOCIO 211 and junior standing. SOCIO-701-3-2208

SOCIO 709. Development of Social Thought. (3) On sufficient demand. Development of social thought from ancient civilization to the middle of the nineteenth century; approaches to the study of society; ideas on human origins and human nature, character and results of associative life, social trends, and social betterment. Pr.: SOCIO 211. SOCIO-709-0-2208

SOCIO 710. Systematic Analysis of Social Theory. (3) I. Examination of sociological theory with reference to the nature of scientific explanation and the function of scientific theory. Critical study and analysis of selected social theory and major social theorists with the objective of clarifying the conceptual and logical structure of underlying theoretical models and their assumptions about man and society. Pr.: SOCIO 511 or equiv. SOCIO-710-0-2208

SOCIO 724. Qualitative Methodology. (3) On sufficient demand. Collection, analysis, and presentation of sociological data using such methods as participant observation, ethnomethodology, community analysis, documentary research and historiography, case study, and life history. Emphasis upon formulation of problems and the execution of research. Pr.: SOCIO 520 and STAT 330 or equiv. SOCIO-724-2-2208

SOCIO 725. Intermediate Methods of Social Research. (3) II. Current sociological research techniques, strategies of research design, construction of research instruments, logic of sociological inquiry, conceptualization, problem formation, and preparation of research proposals. Pr.: SOCIO 520 and STAT 330. SOCIO-725-1-2208

SOCIO 730. Social Demography. (3) I. The study of human population, including the social, economic, political, ecological, and cultural determinants and consequences of changes in fertility, mortality, and migration. Pr.: Nine hours of sociology or equiv. Pr.: SOCIO 211. SOCIO-730-1-2208

SOCIO 732. Community Change. (3) II. A variable content course which in any given semester will deal with one of the following topics: nonmetropolitan communities, metropolitan communities, or applied community change. May be repeated once. Pr.: SOCIO 532 or equiv. SOCIO-732-0-2208

SOCIO 734. Sociology of Agricultural Development. (3) I, in odd years. Comparative rural systems in developing countries; emphasis on land tenure, peasant movements, relationship of agriculture to rest of society, and influence of developed countries on the agriculture of developing countries. Pr.: SOCIO 211. SOCIO-734-0-2208

SOCIO 735. Human Ecology. (3) II, in even years. The interrelationships among population, technology, environment, and social organization. An examination of the origins and development of human ecology in sociology, and recent attempts to redefine the area. Special emphasis on current theoretical and research efforts. Pr.: SOCIO 211 and consent of instructor. SOCIO-735-0-2208

SOCIO 736. Applied Agricultural and Rural Change. (3) I, in even years. Examination of agricultural and rural development projects and programs and how they fit into national and regional social and cultural systems in developing countries. Emphasis on locally and regionally based development strategies. Examination of the role of international agencies in understanding shifts in dominant approaches to applied rural change. Pr.: SOCIO 211 or ANTH 200. Same as ANTH 736. SOCIO-736-0-2208

SOCIO 737. Methods in Human Ecology. (3) Techniques for accessing, manipulating, and creating aggregate, ecological data from private and public sources including the U.S. Census through address matching or location identification, aggregation, and calculation of ecological potentials. Prepares students for doing basic and applied research in human ecology, sociology, and other related fields. Pr.: SOCIO 520 or equiv. SOCIO-737-0-2208

SOCIO 740. Comparative Social Systems. (3) I, in even years. Compares social systems in different regions of the world. Examines models of comparative and historical sociology. Provides students with a background for conducting and evaluating comparative research. Treats such issues as socioeconomic development, group relations, and age and sex roles from a cross-cultural perspective. Pr.: SOCIO 211 or ANTH 200 and a 500-level course in social or cultural change and development. SOCIO-740-0-2208

SOCIO 741. Social Differentiation and Stratification. (3) I, in odd years. Analysis of societal organization based on age, sex, residence, occupation, community, class, caste, and race. Pr.: SOCIO 211. SOCIO-741-0-2208

SOCIO 742. Society and Change in South Asia. (3) II, in even years. Examines recent studies of family and community, population, mobility, urbanization, and modernization in the India-Pakistan region, with focus on social change. Pr.: SOCIO 211 or ANTH 200 and either a 500-level course in South Asian studies or one in social change and development. SOCIO-742-0-2208

SOCIO 744. Social Gerontology: An Introduction to the Sociology of Aging. (3) II. Analysis of the phenomenon of human aging in its individual, social, and cultural aspects with special attention to the problems of aging populations in Western societies. Pr.: SOCIO 211. SOCIO-744-0-2208

SOCIO 750. Social Control. (3) Analysis of social and institution processes and mechanisms of social control: socialization, role allocation, systems of social sanctioning, growth and dynamics of institutional systems of social control emphasizing its character at the institutional and societal level of analysis. Pr.: SOCIO 211. SOCIO-750-0-2208

SOCIO 751. Social Change. (3) II, in odd years. Social and cultural evaluation, including diffusion and parallel development; the lag hypothesis; influential factors in, and consequences of, social change; the process of social change, contemporary theories, including directed social change. Pr.: SOCIO 211. SOCIO-751-0-2208

SOCIO 752. Social Roles and Social Relationships. (3) II, in odd years. Analysis of the processes of interpersonal perception, attraction, and social interaction in the formation, maintenance, and change of social relationships and social roles. Particular emphasis is placed on the importance of such processes for the formation of social groups and social interaction in a variety of social contexts. Consideration of major theoretical approaches and their empirical foundations. Pr.: SOCIO 211 and 550. SOCIO-752-0-2208

SOCIO 767. Social Reactions to Deviance. (3) Selected topics in the sociology of deviance, such as (1) public reactions to deviant persons and groups, (2) the nature and extent of formally organized responses to deviance, and (3) deviance considered from the perspective of deviant actors. Pr.: SOCIO 411 and consent of instructor. SOCIO-767-0-2208

Graduate credit

SOCIO 808. Advanced Issues in Sport Sociology. (3) On sufficient demand. An in-depth analysis of the sociology of sport literature with special interest in critiquing the theoretical frameworks and methodologies employed. Pr.: PE 745 or SOCIO 745. SOCIO-808-0-2208

SOCIO 810. Contemporary Sociological Theory. (3) II. Comparative analysis of contemporary schools of sociological thought showing their development, current status, and possible future trends. Emphasis on structural functionalism, Marxism and neo-Marxism, symbolic interactionism, phenomenology and

ethnomethodology, and exchange theory. A working knowledge of classical sociological theory is assumed. Pr.: SOCIO 710 or equiv. SOCIO-810-0-2208

SOCIO 825. Advanced Quantitative Methods. (3) I. Prepares students to carry out sophisticated research, to understand current quantitative sociological journals, and to apply advanced statistical techniques to sociological data. Pr.: SOCIO 725; STAT 702 or equiv. SOCIO-825-0-2208

SOCIO 898. Master's Report Research. (Var.) I, II, S. SOCIO-898-4-2208

SOCIO 899. Master's Thesis Research. (Var.) I, II, S. SOCIO-899-4-2208

SOCIO 901. Research Problems in Sociology. (Var.) I, II, S. Individual study and research for students admitted to doctoral standing in the Graduate School. Pr.: M.A., consent of instructor. SOCIO-901-0-2208

SOCIO 911. Seminar in Sociological Theory. (3) II. Selected topics in sociological theory. May be repeated with consent of supervisory committee. Pr.: SOCIO 710 and 810. SOCIO-911-0-2208

SOCIO 922. Specialized Techniques of Social Research. (3) On sufficient demand. Intensive examination of the problems and techniques of design, data collection, analysis, and interpretation which accompany a particular strategy of basic or applied research. Topics announced for the semester in which the course is offered. May be repeated with consent of department. Pr.: SOCIO 211 or equiv. SOCIO-922-0-2208

SOCIO 923. Methods of Social Policy Research. (3) Examination of principles, techniques, and design of retrospective and prospective social policy research. Pr.: SOCIO 725 or equiv. SOCIO-923-0-2208

SOCIO 931. Seminar in Demographic Methods. (3) II, in odd years. Demographic processes such as fertility, mortality, and migration, with emphasis on measurements, methods, and analytical techniques. Includes the construction of life tables and population estimates and projections. Pr.: SOCIO 725 and 730. SOCIO-931-0-2208

SOCIO 932. Seminar in Rural Sociology. (3) I, in even years. A sociological survey of research and empirical data on rural life and modes of management or control of agricultural organization for world geographic regions or individual nations. Pr.: SOCIO 732 or 736 or equiv. SOCIO-932-0-2208

SOCIO 940. Seminar in Social Organization. (3) II, in even years. Consideration of selected approaches to the study of societal organization, organizational theory, and analysis. Pr.: Consent of instructor. SOCIO-940-0-2208

SOCIO 944. Seminar in the Sociology of Aging. (3) Consideration of selected topics and issues in the sociology of aging such as retirement and institutional change, societal reactions to aging, population structure and socioeconomic consequences of aging populations, the social organization of leisure, the impact on social organization of services for older people, the structural and organizational consequences of widowhood, age-grading and stratification in aging populations, analysis of the impact on community structure, and organization of special institutions for older people. Pr.: SOCIO 744. SOCIO-944-0-2208

SOCIO 950. Seminar in Social Interaction. (3) II, in even years. Examination of current theoretical, methodological, and research issues and topics. Pr.: SOCIO 550, 752, or equiv. SOCIO-950-0-2208

SOCIO 951. Seminar in Societal and Institutional Dynamics. (3) II, in even years. Analyses of change of societies and institutions; consideration of rates, degree, and direction of change, and of means employed to plan change in modern or emerging nations. Pr.: SOCIO 751 or equiv. SOCIO-951-0-2208

SOCIO 962. Seminar in Deviant Behavior and Social Disorganization. (3) I, in odd years. Analysis in detail and depth of selected forms of deviant behavior and their relevance to social disorganization. Pr.: Consent of instructor. SOCIO-962-0-2208

SOCIO 999. Ph.D. Dissertation Research. (Var.) SOCIO-999-4-2208

Social work

Social work is concerned with the interaction between people and their social environments. Social workers help people deal with other people, cope with the many social and environmental forces which affect and control daily life, and help solve problems which inhibit growth and development.

The undergraduate social work program is accredited by the Commission on Accreditation of the Council on Social Work Education to educate entry-level, generalist social work practitioners. The social work undergraduate major is of particular value to students who intend to pursue a professional career in social welfare upon graduation.

The bachelor's degree in social work is recognized as a beginning-level professional degree. Students graduating from the social work program are eligible for licensure as bachelor degree social workers in Kansas and numerous other states. No other bachelor's degree is recognized, or necessary, for such eligibility. Furthermore, students who wish to pursue graduate studies in social welfare will be eligible for advanced standing in many master of social work programs throughout the United States.

The intervention tasks performed by social workers are derived from a common base of knowledge, values, and skills. Thus, social workers are uniquely qualified to provide resources, services, and opportunities to individuals, groups, families, organizations, and communities. Students are required to complete a field practice placement during their senior year to integrate classroom material with on-the-job experience in a professional setting.

The student wishing to declare a major in social work may enroll directly in curriculum SOCWK. This is a provisional admission to the social work program. Students must complete SOCWK 010 before formal evaluation and admission to the program can occur.

Formal evaluation occurs prior to admission to SOCWK 560, Social Work Practice I, taken during the junior year. At that time the student completes a personal statement, and undergoes a formal review of academic and classroom performance by the program admissions committee. The student must have a 2.5 overall GPA, and a 3.0 GPA in the core courses. A student successfully passing this review may enter

the first course in the practice sequence, SOCWK 560.

Before completing SOCWK 560 the student completes an interviewing skill demonstration which is reviewed by the program admissions committee to determine preparedness to complete the major. Failure to meet the standards of the program will result in dismissal from the social work major. A student may be allowed to remain in the major on conditional or probationary status, but the student must meet the standards of the program to complete the major.

For complete details on the admissions procedure, see the program admissions policy in the student handbook. Appeals of program faculty decisions may be made through established departmental procedures.

A student earning a B.A. or B.S. in social work must complete 120 hours including Orientation to the Social Work Major, SOCWK 010; Introduction to Social Work, SOCWK 260; 43 hours of major courses; and 22 hours of tool and related courses.

| Human behavior and the social environment content (28 hours) | | |
|--|---|---|
| SOCIO 211 | Introduction to Sociology | 3 |
| SOCIO 511 | Comparative Social Theory | 3 |
| SOCIO 532 | Community Organization and Leadership | 3 |
| ANTH 200 | Introduction to Cultural Anthropology | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCWK 567 | Human Behavior and the Social Environment | 3 |
| POLSC 110 | Introduction to Political Science ... | 3 |
| | or | |
| POLSC 301 | Introduction to Political Thought .. | 3 |
| ECON 110 | Economics I | 3 |
| BIOL 198 | Principles of Biology | 4 |

| Social work practice content (8 hours) | | |
|---|--------------------------------|---|
| SOCWK 560 | Social Work Practice I | 3 |
| SOCWK 561 | Social Work Practice II | 3 |
| SOCWK 568 | Social Work Practice III | 2 |

| Research content (8 hours) | | |
|-----------------------------------|---|---|
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |
| SOCWK 579 | Methods of Social Work Research .. | 4 |
| SOCWK 550 | Field Practicum Research Preparation | 1 |

| Social policy content (6 hours) | | |
|--|---|---|
| SOCWK 510 | Social Welfare as a Social Institution | 3 |
| SOCWK 565 | Program and Policy Formulation and Analysis | 3 |

| Field practicum (12 hours) | | |
|-----------------------------------|------------------------|----|
| SOCWK 562 | Field Experience | 12 |

| Professional social work seminar (3 hours) | | |
|---|-------------------------------------|---|
| SOCWK 564 | Social Work Professional Seminar .. | 3 |

Courses in social work

Undergraduate credit

SOCWK 010. Introduction to the Social Work Major. (0) I, II. Information for new social work majors on the requirements, content, and objectives of the course sequences, and on the formal admissions process; and emphasizes the importance of the liberal arts foundation as the basis for the professional content. SOCWK-010-0-2104

SOCWK 260. Introduction to Social Work. (3) I, II. An introduction to the profession of social work and the various fields of social service by observing, experiencing, and analyzing social work and its place in society. An opportunity for the student to test social work as a possible career choice. SOCWK-260-0-2104

SOCWK 310. Topics in Social Work. (1-3) I, II. Supervised independent study projects. Pr.: Consent of the instructor. SOCWK-310-0-2104

SOCWK 495. Chemical Dependency/Codependency: The Therapeutic Intervention Process. (3) The purpose of this course is to provide the student/practitioner with an understanding of the underlying etiology of chemical dependency and codependency and to provide the opportunity to be a participant and observer in the intervention process during family. The use of lectures, video tapes, discussion, role playing, and direct intervention will be utilized. Enrollment by permission of instructor. This course is offered at off-campus sites only. SOCWK-495-0-2104

SOCWK 499. Senior Honors Thesis. (2) On sufficient demand. Open only to seniors in the arts and sciences honors program. SOCWK-499-4-2204

Undergraduate and graduate credit in minor field

SOCWK 501. Proficiency Development. (I-3) Integrative review of social work concepts and skills under faculty supervision. For single students or groups of students. Not applicable to major field requirements. Not repeatable. Pr.: Consent of instructor and superior performance in relevant course. SOCWK-501-0-2104

SOCWK 510. Social Welfare as a Social Institution. (3) I, II. The development and present status of social welfare in meeting changing human needs and the requirements in other parts of our social system; the analysis of present-day philosophy and the functions of social welfare. Same as SOCIO 510. Pr.: One course in each of the following areas: sociology, economics, and political science. SOCWK-510-0-2104

SOCWK 519. Methods of Social Work Research. (4) I, II. Focus is on research application in area of baccalaureate social work practice. Particular attention is given to research strategies for the evaluation of social work practice, for gathering information about communities and clientele, and for examining the impact of social policies at the local level. The content examines the ethics and processes of research, including the issues of research problem identification and selection, the use of the library to support the research effort, design considerations, problems of analysis with small samples, and presentation of research findings. Includes I credit hour of lab and field experience. Pr.: STAT 330 and SOCWK 260. Open to social work majors. SOCWK-519-0-2104

SOCWK 543. Women's Mental Health Issues. (3) II. Investigates prevalent women's mental health issues such as the incidence of depression/anxiety, eating disorders, sexuality, relationship concerns. Also covers the efficacy of traditional treatment modalities and newer therapies that target women's unique mental health needs, such as feminist or nonsexist therapies. Pr.: One course in women's studies, social work, psychology, or family therapy. SOCWK-543-0-2104

SOCWK 550. Field Practicum Research Preparation. (1) I, II. Social work majors take this course in the semester before enrollment in SOCWK 562, Field Experience. The student is expected to prepare a research proposal which describes research that will be completed in the field practicum setting. In addition, the student is expected to complete 50 hours of volunteer time in the assigned field practicum setting. Pr.: SOCWK 519 and senior standing. Social work majors only. SOCWK-550-0-2104

SOCWK 560. Social Work Practice I. (3) I, II. Introduction to the basic helping skills and techniques common to social work practice. The social systems perspective is used to guide the development of a problem-solving methodology with attention to information gathering, assessment, and problem identification. Values clarification and self-awareness

are emphasized and the skills needed for intervention, termination, and evaluation are introduced.

Pr.: SOCIO 211; PSYCH 110; ANTH 200; junior standing and permission of the instructor. SOCWK-560-0-2104

SOCWK 561. Social Work Practice II. (3) I, II.

Continuation of SOCWK 560 with emphasis on skill development in intervention techniques, and practice evaluation from a social systems perspective. A variety of intervention strategies and techniques is presented with emphasis on the development of a social work frame of reference. Pr.: SOCWK 560, 567; senior standing and permission of the instructor. SOCWK-561-0-2104

SOCWK 562. Field Experience. (12) I, II. Supervised

field experience in community agencies and programs as a practical application of social work knowledge and skills gained from major course work. Emphasis on direct work with clients, whether individuals, groups, or communities. Seminars make use of student's experiences to analyze social work theory and practice. Pr.: SOCWK 550, 561, 567; senior standing; social work majors only; permission of the instructor. SOCWK-562-2-2104

SOCWK 563. The Practice of Social Work in Rural

Areas. (3) On sufficient demand. A review of characteristics and social problems of rural areas. The development of practice competency in social work roles and skills necessary for rural practice. Pr.: SOCWK 560. SOCWK-563-0-2104

SOCWK 564. Social Work Professional Seminar. (3) I,

II. A review of various theories in the behavioral sciences which influence the practice of social work. Primary focus of the course is on the use of these theories in implementing change in various client systems. Pr.: To be taken conc. with SOCWK 562. Social work majors only. SOCWK-564-0-2104

SOCWK 565. Program and Policy Formulation and

Analysis. (3) I, II. Examination of policies and programs developed to cope with various social problems. Emphasis will be placed on analysis of existing programs and policies and the formulation of alternative policies. Attention will be given to policy change through organizational and legislative action. Same as SOCIO 565. Pr.: SOCWK 510; one course in each of the following areas: sociology, economics, and political science; and one course in social science research methods. SOCWK-565-0-2104

SOCWK 566. Social Work in Aging Services. (3) Social

work practice course focusing attention on working with institutionalized and noninstitutionalized elderly. Role of the social worker is explored in the context of physical, psychological, social, and economic aspects of aging. Skills in working with elderly are emphasized through classroom and direct practice in social work or in gerontology. Pr.: Three course hours in social work or gerontology. SOCWK-566-0-2104

SOCWK 567. Human Behavior in the Social

Environment. (3) I, II. An introduction to the relationship among biological, social, psychological, and cultural systems as they affect or are affected by human behavior as it relates to social world models of practice. Emphasis on social systems understanding of human development. Pr.: SOCWK 260, BIOL 198, PSYCH 110, SOCIO 211, and ANTH 200. SOCWK-567-0-2104

SOCWK 568. Social Work Practice III. (2) I, II.

Continuation of social work practice sequence with focus on skills development for macro-level social work practice. Community and organization intervention strategies are presented with emphasis on the development of a social work frame of reference. Taken conc. with SOCWK 561. Pr.: SOCWK 560; senior standing; open to social work majors only. SOCWK-568-0-2104

Undergraduate and graduate credit

SOCWK 610. Topics in Social Work. (1-3) Supervised independent study projects. Pr.: SOCWK 260 plus 6 hours of behavioral science foundation courses and consent of instructor. SOCWK-610-3-2104

Speech

Harold J. Nichols,* Head

Professors Fedder,* Flanagan,* Nichols,* and Zivanovic;* Associate Professors Anderson, Armagost,* Hinrichs,* Kahlich, Rainbolt,* Schenck-Hamlin,* Shelton,* and Uthoff; Assistant Professors Gilbert,* Griffin,* Hoag, McFarland, Maullar,* Procter,* Quirk-Chitwood, Ross, Schiappa,* and Smit;* Instructors Brown, Goulden, Keehner, Molineux, Salva, Schraeder-Neidenthal, and Wade.

Undergraduate study

The Department of Speech offers study in rhetoric/communication, linguistics, theatre, speech pathology-audiology, and dance.

The undergraduate major requires at least 21 hours in one of the four areas and 9 hours in other areas within the department. See speech secondary education requirements, College of Education, for teacher certification.

Graduate study

In the Department of Speech major work is offered leading to the degree master of arts in the following fields: rhetoric/communication, speech pathology-audiology, and theatre.

A student majoring in any of the above areas may select a minor field either outside the department or within the department. Only certain areas are approved for minor work within the department when the major is also within the department.

Prerequisite to major graduate work in these fields is the completion of the four-year undergraduate program substantially equivalent to that required of general arts and sciences students, the curriculum to include sufficient elementary work in the appropriate area of speech to prepare the student for the advanced field chosen.

The master of arts degree may be pursued by students in the department under one of the following plans: plan A: a minimum of 30 semester hours of graduate credit including a master's thesis of 6 to 8 semester hours; plan B: a minimum of 30 semester hours of graduate credit including a written report of 2 semester hours either of research or of problem work on a topic in the major field; plan C: a minimum of 30 semester hours of graduate credit in course work only, but including a project which discloses evidence of creative ability.

Students in theatre may, with graduate faculty approval, elect any one of plans A, B, or C.

Students in rhetoric/communication may, with graduate faculty approval, elect plan A

or B. Students in speech pathology-audiology may, with graduate faculty approval, elect plan A or C.

Written and oral examinations will be required in all areas.

Rhetoric and communication

Rhetoric, one of the original liberal arts, is concerned with the theory, criticism, and practice of communication. The rhetoric/communication program has two instructional goals. First, the program attempts to improve a student's communication skills in developing messages which are clear, coherent, reasoned, and fluent. Course work in public speaking, group and interpersonal communication, and co-curricular activities in debate and forensics provide opportunities to acquire practical communication skills. Second, the program attempts to develop a student's ability to analyze communication in different social, political, and organizational settings. Course work in theory, history, and criticism focuses on the study of speech and language used to achieve practical ends. A major in rhetoric/communication would be appropriate for anyone who plans to enter a career that is communication-intensive, such as law, education, public relations, or government.

Undergraduate

Undergraduate students in rhetoric/communication are required to take at least 21 credit hours of course work in rhetoric/communication and 9 credit hours in other divisions of the department. The 21 credits in rhetoric/communication must be distributed as follows:

| | |
|---|----------|
| Rhetorical and communication theory | 6 |
| SPCH 320 Theories of Human Communication | 3 |
| SPCH 330 The Rhetoric of Western Thought .. | 3 |
| Communication in applied settings | 3 |
| One of the following: | |
| SPCH 210 Forensics Participation (minimum of three semesters) | 3 |
| SPCH 321 Public Speaking II | 3 |
| SPCH 325 Argumentation and Debate | 3 |
| SPCH 326 Small Group Discussion Methods .. | 3 |

Major electives

Of the additional 12 credit hours, all must be 300-level or above with at least 6 credit hours numbered 430 or above.

Graduate

Graduate students become eligible for a master of arts degree in rhetoric/communication by completing at least 30 credit hours of graduate work. Prerequisite to admission into the graduate program in rhetoric/communication are a superior academic record and background work essentially equivalent to our undergraduate major. In some cases, students are admitted on a provisional basis to make up deficiencies in undergraduate preparation.

Students may select plans A, B, or C as described above. For those selecting plan A, students must complete a minimum of 30 semester hours of graduate credit, including 6 credit hours of thesis. Twenty-four credit hours must be in rhetoric/communication. A master's thesis identifies an original research problem, implements an appropriate methodology, and reports and interprets its findings. Students must pass an oral examination which includes a defense of the thesis.

Students selecting plan B must complete a minimum of 32 semester hours of graduate credit, including 2 hours for a research report (SPCH 899). Twenty-six credit hours must be in rhetoric/communication. A research report is an academic essay that reviews and critically examines research literature within the discipline. Students must pass an oral examination which includes a defense of the report.

Students selecting plan C must complete a minimum of 30 semester hours of rhetoric/communication. Publication of an article-length paper in a refereed regional or national disciplinary journal will substitute for the thesis/report. Students must pass an oral examination which includes a defense of the publication.

Both the master's thesis and research report require prospectus approval by the student's graduate committee and adherence to Graduate School and departmental guidelines. All graduate students in rhetoric/communication will take SPCH 720, 730, 821, and 822.

Quiz-out

A student may earn 3 hours of credit for Public Speaking I by completing the quiz-out option with a grade of C or better. Students electing this option **must** (a) enroll in quiz-out as specified in the current schedule of classes; and (b) attend a **mandatory** informational meeting at the beginning of that semester.

Courses in rhetoric and communication

SPCH 035. Special Studies in Intensive English. (3-6) I, II. Equivalent to enrollment in one or two segments (structure, writing, reading, or speaking and listening) of Intermediate Intensive English I or II. Placement by the English Language Program according to the student's needs and ability level. SPCH-035-0-1508

SPCH 040. Intermediate Intensive English I. (15) I, II. Intensive study of basic English sentence structure, writing, reading, speaking, and listening for native speakers of other languages. Pr.: TOEFL score of 400 or above. SPCH-040-0-1508

SPCH 050. Intermediate English II. (15) I, II. Continued intensive study of English structure, writing, reading, speaking, and listening. Placement by the English Language Program. SPCH-050-0-1508

SPCH 065. Spoken English for International Students. (3) I, II. Intensive practice in spoken American English for increased fluency and overall comprehensibility. SPCH-065-1-1506

SPCH 070. Advanced English as a Second Language. (6) I, II. A support course required of international students whose performance on the English screening test indicates that they would still benefit from half-time instruction in English. Three specialized sections are offered: for undergraduates, for graduate students in technical fields, and for graduate students in non-technical fields. Placement by the English Language Program or on the recommendation of an advisor. SPCH-070-0-1508

SPCH 080. Speech Seminar. (0) Special topics and lectures for speech majors. Required of all majors each semester. SPCH-080-0-1506

SPCH 090. Teaching Public Speaking I and IA. (0) Seminar for graduate teaching assistants in strategies, techniques, and materials for the introductory public speaking course; includes current practices and research in communication education. Enrollment limited to graduate teaching assistants in the Department of Speech. SPCH-090-0-1506

Undergraduate credit

SPCH 105. Public Speaking IA. (2) I, II, S. Alternate to SPCH 106. Principles and practice of message preparation, audience analysis, presentational skills, and speech criticism. Primarily granted for students whose curricula require a 2-credit hour course. Credit not granted for both SPCH 105 and 106. SPCH-105-0-1506

SPCH 106. Public Speaking I. (3) I, II, S. Principles and practice of message preparation, audience analysis, presentational skills, and speech criticism permitting greater practice in oral presentation. Credit not granted for both SPCH 105 and 106. SPCH-106-0-1506

SPCH 107. Public Speaking for International Students. (3) I, II. Speaking, reading, and writing for international students whose linguistic ability in American English is below that of the native American student; emphasis on aural-oral approach to structural patterns of spoken English. Pr.: Satisfactory score on the Speech Proficiency Examination for International Students. SPCH-107-1-1506

SPCH 109. Public Speaking IA, Honors. (3) Honors speech preparation and delivery; a survey of topics basic to rhetoric, communication, and linguistics. For arts and sciences honors students. SPCH-109-0-1506

SPCH 210. Forensics Participation. (1-2) I, II. Intercollegiate debate or individual events. Four hours maximum credit. Pr.: Consent of director of the activity. SPCH-210-2-1506

SPCH 311. Business and Professional Speaking. (3) I, II. Principles and practice of speaking in an organizational setting. Areas of emphasis will be oral reports, interviewing, interpersonal communication, and conducting meetings. SPCH-311-0-1506

SPCH 320. Theories of Human Communication. (3) I. Survey of basic theories of human communication focusing on sending, receiving, and responding to messages face-to-face. Pr.: SPCH 105 or 106. SPCH-320-0-1506

SPCH 321. Public Speaking II. (3) I, II. Advanced principles and practice of speech composition, audience adaptation, and delivery. Pr.: SPCH 105 or SPCH 106. SPCH-321-0-1506

SPCH 322. Interpersonal Communication. (3) I, II, S. Examination of the dynamics of face-to-face interpersonal interaction. Focus is on applying principles of relational communication. SPCH-322-0-1506

SPCH 323. Nonverbal Communication. (3) II. Analysis of nonverbal communication in human interaction; theory and research in kinesics, proxemics, and paralinguistics. Pr.: SPCH 105 or 106. SPCH-323-0-1506

SPCH 325. Argumentation and Debate. (3) I, II. Basic theories of argumentation with emphasis on their application in academic debate. Pr.: SPCH 105 or 106. SPCH-325-0-1506

SPCH 326. Small Group Discussion Methods. (3) I, II, S. Basic concepts of small-group decision making. Projects emphasize participation in and analysis of communication in the small group. Pr.: SPCH 105 or 106. SPCH-326-0-1506

SPCH 328. Professional Interviewing. (3) Investigation of interviewing as it occurs in a variety of situations, including journalistic, diagnostic, persuasive, and managerial. Emphasis on developing practical skills in planning, managing interviews, and interpreting data in the professional context. Pr.: SPCH 105 or 106. SPCH-328-1-1506

SPCH 330. Rhetoric in Western Thought. (3) I. An introduction to the figures, concepts, and trends in the development of rhetorical theory from classical to modern times. Pr.: SPCH 105 or 106. SPCH-330-0-1506

SPCH 335. Criticism of Public Argument. (3) I, II. Study and application of principles of argumentation pertaining to public policy disputes, including the nature of inference, validity tests, linguistic strategies, value systems, and argument criticism. Particular issues of foreign and domestic policy are examined as representative of recurring forms of argument. SPCH-335-0-1506

SPCH 398. Sophomore Honors Seminar. (3) II. Open only to qualified students in the arts and sciences honors program. SPCH-398-0-4900

SPCH 421. Technical Speaking. (3) I, II. Intensive study of the principles and practice of communication for engineers. Emphasis is on presentational speaking and group decision making. Pr.: Enrollment in College of Engineering with junior or senior standing. SPCH-421-0-1506

SPCH 426. Coaching and Directing Speech Activities. (3) I. Current practices in coaching curricular and extra-curricular speech activities with practical experience in the problems and procedures of directing a forensic program. Pr.: Six hours of general speech or theatre courses that are 200 level or above, SPCH 325, and THRE 263. SPCH-426-0-1506

SPCH 430. Freedom of Speech. (3) II. A study of communication and legal principles pertaining to freedom of expression, and an examination of their implications for competing interests such as public order, national security, morality, civil rights, and fairness. SPCH-430-0-1506

SPCH 432. The Rhetoric of the American Presidency. (3) I, II. An examination of the American presidency from a rhetorical perspective, emphasizing the symbolic resources and duties of the office and those who hold it. Special attention paid to the public discourse of recent presidents during moments of national crisis. Pr.: SPCH 105 or 106. SPCH-432-0-1506

SPCH 434. Rhetoric and Social Movements. (3) II. A study of the scope and functions of persuasive communication in contemporary social movements. Pr.: SPCH 105 or 106. SPCH-434-0-1506

SPCH 435. Political Communication. (3) II. A study of political discourse. Attention is directed to theory that encompasses political discourse as it affects political behavior. Pr.: SPCH 105 or 106. SPCH-435-0-1506

SPCH 460. Rhetoric of the Sixties. (3) I. Rhetorical interpretation of the social and political forces dominating the decade and an examination of the forms of persuasion which these forces brought to life. Emphasizes political leadership, pressures for social change, foreign policy, and transformation of the rhetorical environment. Pr.: SPCH 105 or 106. SPCH-460-0-1506

SPCH 498. Honors Tutorial in Speech. (1-3) I, II. Individual directed research and study of a topic in speech, normally as a preliminary to writing a senior honors thesis. May be repeated once to a total of 3 hours. Pr.: Sophomore standing, membership in the honors program of the College of Arts and Sciences, and permission of the instructor. SPCH-498-0-1506

Undergraduate and graduate credit in minor field

SPCH 520. Analysis of Experimental Research Literature in Speech. (3) A study of the literature employing the experimental method in general speech, speech pathology and audiology, and theatre. Pr.: Six hours in speech. SPCH-520-0-1506

SPCH 525. Argumentation Theory. (3) II. An advanced study of prominent argumentation theorists including Chaim Perelman and Stephen Toulmin, with an in-depth examination of special topics concerning the philosophy, theory, and practice of argumentation. Pr.: SPCH 125. SPCH-525-0-1506

SPCH 526. Persuasion. (3) II. The study of communication as persuasion; examination of contemporary approaches to persuasion. SPCH-526-0-1506

Undergraduate and graduate credit

SPCH 630. Special Topics in Rhetoric and Communication. (3) II. Intensive study of selected topics in communication and rhetoric. Repeatable with change in topic. Pr.: Junior standing and consent of instructor. SPCH-630-0-1506

SPCH 720. Perspectives on Communication. (3) Analysis of current perspectives on the communication process. Materials cover assumptions, principles, implications, and selected research within each perspective. Pr.: SPCH 320. SPCH-720-0-1506

SPCH 721. Language and Social Interaction. (3) II. Study of the epistemological, social, and behavioral functions of language in communication. Examination of the processes by which language functions to construct one's worldview and guide individual action. Pr.: SPCH 320 or LING 280 or ANTH 220; junior standing. SPCH-721-0-1506

SPCH 725. History of American Public Address. (3) Study of American speakers, from the time of Jonathan Edwards to the present, including their training, speeches, and effectiveness. Pr.: Junior standing and consent of instructor. SPCH-725-0-1506

SPCH 726. Seminar in Persuasion. (3) II, in odd years. Survey and analysis of advanced theory and experimental studies in persuasion. Pr.: Junior standing. SPCH-726-0-1506

SPCH 730. Classical Rhetorical Theory. (3) Study of rhetorical theory and criticism from early Greek to Roman times. Pr.: SPCH 330 or graduate standing. SPCH-730-0-1506

SPCH 732. Contemporary Rhetorical Theory. (3) II. Study of major European and American contributors to rhetorical theory in the twentieth century. Pr.: SPCH 730. SPCH-732-0-1506

SPCH 733. Rhetorical Criticism. (3) II. Study of traditional and contemporary approaches to the analysis of public discourse. Pr.: SPCH 330. SPCH-733-0-1506

SPCH 799. Problems in Speech. (Var.) Open to students in any speech area. Pr.: Junior standing and consent of instructor. SPCH-799-3-1506

Graduate credit

SPCH 810. Research Writing in Rhetoric/Communication. (1) A study of the problems in writing and rewriting the results of scholarly investigations in rhetoric/communication. Pr.: Graduate standing in rhetoric/communication. SPCH-810-0-1506

SPCH 820. Seminar in Rhetoric Communication. (3) Selected topics in rhetoric/communication research. May be repeated for credit with change in topic. SPCH-820-3-1506

SPCH 821. Communication Research Methods I. (3) I. Descriptive and experimental methodologies pertinent to investigations in rhetoric/communication. Topics will include such techniques as content analysis, attitude scaling, and stylistic analysis. Pr.: SPCH 520 or equiv. SPCH-821-0-1506

SPCH 822. Communication Research Methods II. (3) II. Historical and critical methodologies pertinent to investigations in rhetoric/communication. Topics will include participant observation, unstructured interviewing, historical research, and discourse analysis. Pr.: SPCH 330 or equiv. SPCH-822-0-1506

SPCH 823. Competitive Forensic Theory. (3) Theory and study of current research in competitive debate and individual events. Pr.: SPCH 125 and 426. SPCH-823-0-1506

SPCH 899. Research in Speech. (Var.) Pr.: Sufficient training to carry on the line of research undertaken and consent of instructor. SPCH-899-4-1506

Linguistics

There is general agreement that nothing is more characteristically human than the ability to use language. Linguists, however, usually do not study languages in order to become proficient in speaking, reading, or writing them. In linguistics we are interested in discovering all the principles that, in a sense, define each language, how it works, how it has changed through time and geographical distribution, as well as how children learn to speak, and how people use language.

There are relationships between linguistics and many other disciplines (see Linguistics, in the general information for the College of Arts and Sciences). Students are encouraged to explore as many of these relationships as they can as undergraduates, especially if they anticipate going on to graduate study.

Undergraduate credit

LING 280. Introduction to the Study of Language. (3) I, II. Survey of the scientific study of language. Contributions of linguistics to an understanding of the nature of language. Presupposes no previous knowledge of linguistics. LING-280-0-1505

LING 594. Comanche Texts. (3) I or II, in alternate years. General introduction to Comanche grammatical and discourse systems and study of oral narratives: published and unpublished texts including coyote stories, adventure stories, personal recollections, etc. Some attention to pronunciation, but major emphasis on the development of a basic reading ability and understanding of the world portrayed in the narratives. Same as LG 594. LING-594-0-1501

LING 595. Archeological Decipherment. (3) I or II, in alternate years. The art and science of four famous cases of decipherment: Mesopotamian cuneiform, Egyptian hieroglyphics, Creto-Mycenaean Linear B, and on-going work on the Maya script. Characteristics of successful decipherments and resultant increases in knowledge about the history of writing and the richness of various cultures of the past. Same as LG 595. LING-595-0-1505

Undergraduate and graduate credit

LING 600. Principles of Linguistics. (3) The scientific study of language, with examples from English, Spanish, French, German, and others. Overview of language origins, phonetics, phonology, syntax, semantics, language acquisition, dialects, language change, and writing systems. Same as ENGL 600 and LG 600. LING-600-0-1505

LING 601. General Phonetics. (3) I or II, in alternate years. Description and classification of speech sounds according to point and manner of articulation. Transcription in the International Phonetic Association Alphabet. Includes sounds of English, French, Spanish, German, and others. Same as ENGL 601 and LG 601. LING-601-1-1505

LING 602. Historical Linguistics. (3) I or II, in alternate years. Internal and comparative reconstruction of earlier forms of languages. Genetic relationships in language families, and various typological considerations. Includes French, Spanish, and others. Same as ENGL 602 and LG 602. LING-602-0-1505

LING 603. Topics in Linguistics. (1-3) I or II, in alternate years. Seminar on a special topic in linguistics: decipherment of ancient writing systems, linguistics applied to the teaching of English or other languages, discourse analysis (especially of spoken texts), etc. Topic to be announced for semester in which offered. Repeatable for credit on a different topic. Same as ENGL 603 and LG 603. LING-603-0-1505

LING 783. Phonology I. (3) Basic concepts of the theory of language sound systems with particular reference to English but including reference to other languages as well. Pr.: SPCH or ENGL 681 and SPCH, ENGL, or MLANG 780. Same as ENGL 783 and LG 783. LING-783-0-1505

LING 785. Syntax I. (3) Basic concepts of syntactic theory, with particular reference to English but including reference to the grammatical systems of other languages as well. Pr.: ENGL 530 or SPCH, ENGL, or LG 780. Same as ENGL 785 and LG 785. LING-785-0-1505

LING 792. Field Methods in Linguistics. (3) On sufficient demand. Techniques of collecting and analyzing linguistic data in the field. Work with language consultants in class, on languages such as Swahili. Pr.: Consent of the instructor. Same as LG 792 and ANTH 792. LING-792-0-1505

LING 796. Theories of Grammar. (3) I, S. Comparative examination of the assumptions, aims, and procedures of four types of English grammar—the normative grammar of Robert Lowth, the historical grammar of Otto Jespersen, the structural grammar of Leonard Bloomfield, and the generative-transformational grammar of Noam Chomsky—and their application. Same as ENGL 796. Pr.: Junior standing, and ENGL 530 or LING 600. LING-796-0-1505

Speech pathology-audiology

The goal of the speech pathology-audiology program is to educate professional personnel who are competent to help children and adults with communicative problems of speech, hearing, and language. The program at Kansas State University meets the current requirements for certification of clinical competence of the American Speech-Language and Hearing Association and the state of Kansas Department of Education requirements for speech clinicians and school audiologists.

Evidence of meeting professional competency requires a minimum of 60 semester hours of academic credit. Twelve of these hours must be obtained in courses which provide information that pertains to normal development and use of speech, language, and hearing.

Thirty of these 60 hours must be in courses which provide information relative to communication disorders, and information about the management of speech, language, and hearing disorders. At least 24 of these 30 semester hours must be in courses in the professional area (speech pathology or audiology) for which the certificate is requested and no less than 6 semester hours may be in audiology for the certificate in speech pathology or in speech pathology for the certificate in audiology. No more than

6 semester hours may be in courses which provide credit for clinical practice obtained during academic training.

Credit for study of information pertaining to related fields that augment the work of the clinical practitioner of speech pathology and/or audiology may also apply toward the total 60 semester hours.

Thirty of the total 60 semester hours which are required for a certificate must be in courses that are acceptable toward a graduate degree. Moreover, 21 of the 30 semester hours must be within the 24 semester hours required in the professional area (speech pathology or audiology) for which the certificate is requested or within the 6 semester hours required in the other area. Determination of the student's program of study and the completion of all requirements for certification are the responsibility of the student and the advisor.

In addition, the master's degree candidate must have completed a minimum of 300 clock hours of supervised direct clinical experience with a variety of disorders and age groups in the Kansas State University Speech and Hearing Center, the public schools, and other off-campus clinical training sites.

Courses in speech pathology-audiology Undergraduate credit

SPPAT 140. Improving Vocal Communication Skills.

(2) Understanding of the vocal mechanism and its relation to the production of speech; laboratory period for the study and practice of speaking skills. Intended for students who desire to improve deficiencies in their speaking ability. May be repeated for a maximum of four hours credit. SPPAT-140-1-1220

SPPAT 200. Exploring the Professional World of Speech-Language Pathology and Audiology. (1) An introduction to the professions of speech-language pathology and audiology. Students will embark on an academic tour of related topics, work settings, and professional issues confronting today's specialists in communication disorders. SPPAT-200-0-1220

SPPAT 240. Elements of English Phonetics. (3) Analysis of sounds which make up English speech and consideration of how sounds vary phonetically and physiologically; acquisition of skill in the transcription of speech into the symbols of the International Phonetic Alphabet. SPPAT-240-0-1220

SPPAT 243. Introduction to Speech Pathology and Audiology. (3) A survey of communication disorders, and an introduction to the fields of speech pathology and audiology which are responsible for the clinical management of these disorders. SPPAT-243-0-1220

SPPAT 250. Experimental Analysis of Vocal Behavior. (3) Study of behavior modification principles which are relevant to the experimental analysis of vocal behavior. The types of vocal behavior investigated extend from uncoded utterances to complex language responses. SPPAT-250-0-1220

SPPAT 340. Hearing Problems and Hearing Tests. (3) I. Survey of the etiology and classification of hearing disorders. Introduction to hearing tests and measurements. SPPAT-340-1-1220

SPPAT 342. Developmental Psycholinguistics. (3) Review of research and theory of early development of language comprehension and production, involving vocalization, phonology, morphology, syntax, semantics, and pragmatics. Discussion of the

relationship between cognition and language as well as other variables influencing language acquisition.

SPPAT-342-0-1220

SPPAT 345. Clinical Procedures in Speech Pathology and Audiology. (3) Orientation to clinical practice. Opportunities for clinical observation of speech, language, and hearing evaluation and therapy. Study of diagnostic tools, therapy materials, equipment, and clinical procedure. Pr.: Sophomore and junior standing majors only. SPPAT-345-0-1220

SPPAT 350. Structure and Function of the Speech Mechanism. (3) Anatomy and physiology of normal and abnormal speech mechanisms, including respiration, phonation, resonance, and articulation. SPPAT-350-0-1220

SPPAT 351. Fundamentals of Hearing. (3) Study of the ear and the mechanics of hearing. SPPAT-351-0-1220

SPPAT 400. Manual Communication. (3) I, II. Study of background information in current trends in the use of sign language. Restricted to sign language used in the United States. Includes instruction in the American Manual Alphabet and Vocabulary for about 700 signs. Primary focus will be application of beginning skills for communication with those who depend on this form of communication. SPPAT-400-0-1220

SPPAT 443. Language Assessment and Intervention. (3) The nature of language disorders as well as general principles of language assessment and intervention are presented. Specific language assessment and intervention methodology for individuals functioning in various stages of cognitive development are reviewed. Language disorders related to the mentally or physically handicapped, emotionally disturbed, and learning disabled are examined. Pr.: SPPAT 342. SPPAT-443-0-1220

SPPAT 446. Articulation/Phonology I. (3) Research, theories, and principles concerning normal acquisition, phonological processes, diagnosis, and management of articulation disorders. Pr.: SPPAT 240. SPPAT-446-0-1220

SPPAT 450. Undergraduate Laboratory in Speech-Language Pathology. (1-3) I, II, S. Supervised practice in the use of the materials and methods of speech-language pathology for the undergraduate student. Pr.: SPPAT 345; conc. or previous enrollment in SPPAT 443 and 446. SPPAT-450-2-1220

SPPAT 456. Principles of Professional Practice. (3) Procedures for establishing program services in varied employment settings (i.e., screening, assessment, caseload selection, scheduling, service models, IEPs, record keeping, budget and fee schedules, and management protocols). Use of resource personnel and interprofessional relationships are discussed. Pr.: Senior standing. SPPAT-456-0-1220

SPPAT 457. Practicum in Public School Speech and Hearing Services. (5-8) II. Observation and participation in the management of speech and hearing impaired children under the supervision of selected public school speech and hearing clinicians. Pr.: Admission to student teaching. SPPAT-457-2-1220

SPPAT 460. Undergraduate Laboratory in Audiology. (1-3) I, II, S. Supervised practice in the use of the materials and methods of audiology for the undergraduate student. Pr.: SPPAT 340 and 351. SPPAT-460-2-1220

SPPAT 489. Undergraduate Topics in Speech-Language Pathology and Audiology. (1-3) Review of current topics in speech-language pathology and/or audiology. May be repeated for a maximum of 6 hours with a change in topic. Pr.: Consent of instructor. SPPAT-489-0-1220

SPPAT 541. Fluency Disorders. (3) I. Research and theory concerning etiology characteristics, assessment, and treatment of individuals with disfluency problems. Pr.: SPPAT 250. SPPAT-541-0-1220

SPPAT 544. Aural Rehabilitation I. (3) I. Study of and techniques for the habilitation or rehabilitation of speech and language problems of the hearing impaired. Pr.: SPPAT 340. SPPAT-544-0-1220

Undergraduate and graduate credit in minor field

SPPAT 555. Language Development. (3) Survey of the development of speech and language skills in children. Pr.: HDF5 310 or EDCI 300. SPPAT-555-0-1220

Undergraduate and graduate credit

SPPAT 600. Manual Communication II. (3) Instruction in an additional 400 to 500 signs in the SEE system. Introduction to elementary ASL techniques. Discussion of other augmentative communication systems. Research will be conducted into the use of various manual communication systems with special populations, including aphasic, language disabled, mentally handicapped, and others. Pr.: SPPAT 400 or basic sign language skills. SPPAT-600-0-1220

SPPAT 605. Communication Disorders and Aging. (3) An introduction to the most common communication disorders of older persons. Appropriate service delivery models and special needs of the elderly are discussed. Pr.: Consent of instructor. SPPAT-605-0-1220

SPPAT 642. Laryngeal Disorders. (3) Research and theory concerning etiologies, assessment, and clinical measurement of laryngeal pathologies. Pr.: SPPAT 350. SPPAT-642-0-1220

SPPAT 740. Hearing Conservation. (3) II or on sufficient demand. Effects of noise on hearing. Development, management, and control of community hearing conservation programs. Pr.: SPPAT 340. SPPAT-740-1-1220

SPPAT 750. Orofacial Anomalies. (2) Research and theory concerning etiology, characteristics, assessment, and clinical management of individuals with orofacial anomalies. Cleft lip and/or palate is emphasized. Pr.: SPPAT 350. SPPAT-750-0-1220

Graduate credit

SPPAT 800. Research Methods in Speech-Language Pathology/Audiology. (3) Introduction to techniques of research planning and experimental design with emphasis on those used most frequently in speech-language pathology/audiology; critical evaluation of selected experiments; and development of technical writing skills. Pr.: Graduate standing. SPPAT-800-0-1220

SPPAT 805. Graduate Laboratory in Speech-Language Pathology. (1-3) Supervised practice in the use of the methods and materials of speech-language pathology. Pr.: SPPAT 345. SPPAT-805-2-1220

SPPAT 806. Graduate Laboratory in Audiology. (1-3) Supervised practice in the use of the equipment, materials, and methods of audiology. Pr.: SPPAT 340 and 351. SPPAT-806-2-1220

SPPAT 810. Articulation/Phonology II. (3) Recent research in specific areas of phonology and articulation development, assessment, and management. Pr.: SPPAT 446. SPPAT-810-0-1220

SPPAT 820. Audiology I. (3) I. Fundamental topics in audiology. Included are monitoring of equipment calibration, pure tone measurements, masking, and speech testing. Laboratory practice is required. Pr.: SPPAT 351. SPPAT-820-0-1220

SPPAT 821. Audiology I Laboratory. (1) Student must be concurrently enrolled in Audiology I. Two hours of lab a week. Pr.: SPPAT 351. SPPAT-821-0-1220

SPPAT 830. Aphasia. (3) Research and theory concerning the nature, etiologies, evaluation, and treatment of aphasia. Pr.: SPPAT 350. SPPAT-830-0-1220

SPPAT 840. Neuropathologies of Speech and Language. (3) Research and theory concerning nature, etiologies, evaluation, and principles of neuropathologies. Pr.: SPPAT 350. SPPAT-840-0-1220

SPPAT 843. Amplification in Hearing Rehabilitation. (3) II. Analysis of electroacoustic characteristics of hearing aids. Earmold acoustics. Selection and use of amplification. Pr.: SPPAT 745 and consent of instructor. SPPAT-843-1-1220

SPPAT 845. Theoretical Foundations of Audiology. (3) Study of the auditory mechanism, with emphasis on critical evaluation of current methods employed in clinical audiology. Pr.: SPPAT 745. SPPAT-845-0-1220

SPPAT 846. Seminar in Stuttering. (3) Current research concerned with stuttering behavior, etiology, developmental aspects, evaluation, and remediation. Pr.: SPPAT 641. SPPAT-846-0-1220

SPPAT 847. Practicum in Audiology and Speech Pathology. (3-6) Audiology: supervised clinical procedures in screening and diagnostic hearing examinations as related to rehabilitative and medical orientations. Management procedures for the hard of hearing. Hearing aid selection. Speech pathology: supervised clinical methods in speech pathology; experience in diagnosis, organization, and administration of treatment programs. May be repeated for a maximum of 15 credit hours. Pr.: Graduate standing in audiology or speech pathology. SPPAT-847-2-1220

SPPAT 849. Topics in Speech-Language Pathology or Audiology. (1-3) Critical review of recent research related to measurement and modification of speech, hearing, or language deficits. May be repeated for a maximum of 9 hours with change in topic. Pr.: Graduate standing. SPPAT-849-0-1220

SPPAT 850. Audiology II. (3) Study of differential diagnostic audiometric procedures in the classification of hearing loss. Topics include middle ear measurement procedures, site of lesion testing, and procedures applicable to the pediatric population. Pr.: SPPAT 820. SPPAT-850-0-1220

SPPAT 855. Seminar in Language Assessment and Intervention. (3) Review of research and theory of current topics in language and cognition. Assessment and intervention methodology will be discussed. Pr.: SPPAT 443. SPPAT-855-0-1220

SPPAT 865. Seminar in Audiology. (3) 1. Study of selected areas of audiology. May be repeated for a maximum of 6 credit hours with change in subject matter. Pr.: SPPAT 755 and 843. SPPAT-865-0-1220

SPPAT 868. Aural Rehabilitation II. (3) Principles and methods of maximizing receptive communication skills of the hearing impaired. Pr.: SPPAT 544. SPPAT-868-0-1220

SPPAT 882. Experimental Phonetics. (3) Introduction to experimental phonetics. Study of the physiologic, acoustic, and perceptual characteristics of speech. Pr.: SPPAT 350 and 351. SPPAT-882-0-1220

Theatre and dance

The undergraduate major in theatre emphasizes the education of students for professional career goals or for cultural enrichment as an avocation. The goal of the theatre program is to develop an awareness of the many areas of theatre and dance and their disciplines. Training is available in all areas of theatre, including scenery, costuming, theatre history and literature, acting, directing, playwriting, and dance. The three purposes of the program are to provide: a liberal arts program in theatre; preparation for advanced training; and the basic theatre skills for the bachelor's candidate. Kansas State University is an accredited institutional member of the National Association of Schools of Theater.

A major consists of 37 hours in theatre and 9 hours in tool courses in other areas of the department. (The course used to satisfy the College of Arts and Sciences requirement of one course in public speaking may not be counted as part of these 9 hours.) The 37 hours in theatre must be distributed as follows:

A theatre core of 21 hours:

| | | |
|-----------|--|---|
| THTRE 261 | Fundamentals of Acting | 3 |
| THTRE 267 | Fundamentals of Stage Costuming and Makeup | 3 |
| | or | |
| THTRE 367 | Stage Costuming | 3 |
| THTRE 368 | Fundamentals of Technical Production | 3 |
| THTRE 370 | Dramatic Structure | 3 |
| THTRE 565 | Principles of Directing | 3 |
| THTRE 572 | History of Theatre I | 3 |
| THTRE 573 | History of Theatre II | 3 |

Twelve additional hours in theatre courses numbered 500 or above (excluding THTRE 710).

Four hours of production work distributed as follows:

Two hours in THTRE 211, Drama Participation; One hour in conjunction with THTRE 368, Fundamentals of Technical Production; one hour with THTRE 367, Stage Costuming, or THTRE 267, Fundamentals of Stage Costuming and Makeup.

Two hours in THTRE 710, Practicum in Theatre.

There will be an oral evaluation of all production work required for the major at the end of each semester.

Music theatre option

An option in music theatre consists of 74 credit hours distributed as follows:

Music courses (23 credits)

| | | |
|----------------------------------|--|---|
| Voice | 8 | |
| MUSIC 200 | Introduction to Musical Style (Styles I) | 3 |
| MUSIC 201 | Textures of Music (Styles II) | 4 |
| MUSIC 250 | Introduction to Music | 3 |
| MUSIC 475 | Opera Workshop | 2 |
| Piano Proficiency | 1 | |
| Seminar in Voice | 0 | |
| Recital attendance (4 semesters) | 0 | |
| Diction | 2 | |

Theatre courses (37 credits)

| | | |
|-----------|---|---|
| THTRE 260 | Stage Movement | 3 |
| THTRE 261 | Fundamentals of Acting | 3 |
| THTRE 368 | Fundamentals of Technical Production with | 3 |
| THTRE 211 | Drama Participation | 1 |
| THTRE 267 | Fundamentals of Stage Costuming and Makeup with | 3 |
| THTRE 211 | Drama Participation | 1 |
| THTRE 370 | Dramatic Structure | 3 |
| THTRE 161 | Fundamentals of Improvisation | 3 |
| | or | |
| THTRE 361 | Intermediate Acting | 3 |
| | or | |
| THTRE 761 | Advanced Acting | 3 |
| THTRE 560 | Advanced Stage Movement | 3 |
| THTRE 561 | Vocal Expression | 3 |
| THTRE 570 | The Musical Comedy | 3 |
| THTRE 571 | The Opera | 3 |
| THTRE 572 | History of Theatre I | 3 |
| THTRE 710 | Practicum | 2 |

Tool courses (9 credits)

| | | |
|-----------|---------------------------------------|---|
| SPCH 330 | Rhetoric in Western Thought | 3 |
| LING 280 | Introduction to the Study of Language | 3 |
| SPPAT 400 | Manual Communication | 3 |

Dance courses (5 credits)

Any sequence/combination of ballet, jazz, or modern.

Concentration in dance

A concentration in dance requires the following:

| | | |
|-----------|-------------------------------|---|
| Core | | |
| DANCE 205 | Dance as an Art Form | 3 |
| DANCE 222 | Movement Improvisation I | 1 |
| DANCE 295 | Dance Composition I | 3 |
| DANCE 321 | Variations and Partnering | 1 |
| DANCE 380 | Musical Stage Dance | 2 |
| DANCE 405 | Applied Movement Fundamentals | 3 |
| DANCE 495 | Dance Composition II | 3 |

| | | |
|-----------|---|-------|
| DANCE 502 | Performance Production (minimum of 3 semesters) | 1-2 |
| DANCE 504 | Performance Aesthetics | 3 |
| DANCE 505 | Methods and Materials of Teaching Dance | 2 |
| DANCE 506 | Dance Education Fieldwork | 1 |
| DANCE 510 | Senior Project | 2 |
| PE 376 | First Aid and CPR | 1 |
| MUSIC 250 | Introduction to Music | 3 |
| THTRE 661 | Professional Development | 1 |
| THTRE 261 | Fundamentals of Acting | 3 |
| THTRE 211 | Drama Participation (with THTRE 267 and 368) | 2 |
| THTRE 267 | Fundamentals of Stage Costuming and Make-Up | 3 |
| THTRE 368 | Fundamentals of Technical Production | 3 |
| | | 42-45 |

Elective Choose one

| | | |
|----------|--|-------|
| ART 100 | Design I | 2 |
| ART 190 | Drawing I | 2 |
| HIST 459 | History of Dance in Its Cultural Setting | 3 |
| PE 455 | Movement Exploration and Creative Dance for Children | 3 |
| | | 44-48 |

Dance technique

Proficiency must be demonstrated by successful completion with a minimum grade of B of Level III in one technique and Level II in another. Enrollment in a minimum of one technique course is required each semester.

Dance courses are listed after theatre courses.

Graduate study

Courses are available leading to the degree of master of arts. Prerequisites to admission into the graduate program in theatre are a superior academic record and background work essentially equivalent to KSU's undergraduate major. In some cases, students are admitted on a provisional basis so they may make up deficiencies in undergraduate preparation.

Graduate students in theatre may elect any one of the plans A, B, or C, as described earlier in this department section. There are three fields of concentration within the theatre area: history, literature, and criticism of theatre; technical production, design, and lighting; and acting, directing, and playwriting.

All graduate students are required to take 9 hours of graduate credit in history, literature, and criticism courses. In addition, all graduate students must take a minimum of 6 hours of graduate credit in one of the other two fields and a minimum of 3 hours of graduate credit in the remaining field. An additional 12 hours of graduate credit is required of each student. A total program of study is decided upon through regular consultation with the student's graduate committee.

Further information about opportunities for financial support, and copies of the preparatory reading list for the written and oral examinations may be obtained by writing the director of graduate studies in theatre in the department.

In neither the undergraduate nor the graduate program in theatre may the

following courses be used to discharge group requirements—**THTRE 160, 165, 235, 560, 563, 664, 710, 712, 763, 779.** They may be used only to discharge elective requirements in the major.

Courses in theatre

Undergraduate credit

- THTRE 160. Introduction to Theatre.** (3) Consideration of the basic elements of theatre: aesthetics, dramatic literature, theatre technology, and producing organizations. **THTRE-160-0-1007**
- THTRE 161. Fundamentals of Improvisation.** (3) Introduction to the techniques of improvisation with the emphasis upon practical participation. **THTRE-161-0-1007**
- THTRE 165. Appreciation of Theatre.** (2) Direct experience with live theatre through an investigation of theatrical materials, forms, and styles, and through attendance at the University theatrical productions. **THTRE-165-0-1007**
- THTRE 211. Drama Participation.** (1-2) I, II. Work in theatrical productions. Four hours maximum credit. Pr.: Consent of director of activity. **THTRE-211-2-1007**
- THTRE 235. Introduction to the Art of Film.** (3) Examination of the means of creating film art. Attention to techniques employed by successful directors, writers, and producers. **THTRE-235-0-1506**
- THTRE 260. Stage Movement.** (3) A study of the technique of stage movement and an investigation of the language of gesture. Students are encouraged to have had a minimum of one semester of ballet or modern dance before entering this course, or to take dance conc. with stage movement. **THTRE-260-1-1007**
- THTRE 261. Fundamentals of Acting.** (3) Theory and practice of fundamental skills and techniques of acting. Major emphasis is on freeing and training the individual's imagination, intellect, body, and voice through designed exercise and performed scenes. May be repeated for a total of 6 hours credit with consent of instructor. **THTRE-261-1-1007**
- THTRE 263. Oral Interpretation of Literature.** (3) Techniques of reading from the printed page, selecting portions from various forms of literature, including narrative poetry, essay, lyric, sonnet, nonfictional prose, scenes from plays, and selected short stories. **THTRE-263-0-1007**
- THTRE 267. Fundamentals of Stage Costuming and Makeup.** (3) I, II. Basic techniques of stage costume construction and theatrical makeup. **THTRE-267-1-1007**
- THTRE 268. Techniques of Makeup.** (3) Techniques of makeup for stage, movies, and television. **THTRE-268-1-1007**
- THTRE 269. Fundamentals of Stage Lighting.** (3) Basic theory of electricity, light, and optics. Practical mechanics of stage lighting safety, instruments, and control systems. **THTRE-269-0-1007**
- THTRE 275. Summer Theatre Workshop.** (0-6) S. Supervised participation in a summer theatre repertory/stock program. Limited to freshmen and sophomores. May be repeated for a maximum of 6 hours credit. Pr.: Consent of instructor. **THTRE-275-2-1007**
- THTRE 361. Intermediate Acting.** (3) Emphasis upon expanding the actor's capabilities through more advanced scene work and character study. Pr.: **THTRE 261** and consent of instructor. **THTRE-361-0-1007**
- THTRE 366. Theatrical Drafting Techniques.** (3) II. Fundamentals of drafting for theatrical ground plans, working drawings, and perspective drawings. **THTRE-366-13-1007**

THTRE 367. Stage Costuming. (3) II. A lec.-lab surveying the principles of costuming for the theatre, television, and film. Conc. enrollment in at least 1 hour of **THTRE 211** required. **THTRE-367-0-1007**

THTRE 368. Fundamentals of Technical Production. (3) I. Materials and techniques used in scenery construction and theatre lighting. Conc. enrollment in at least 1 hour of **THTRE 211** is required. **THTRE-368-0-1007**

THTRE 370. Dramatic Structure. (3) Fundamentals of play analysis for directors with emphasis upon concepts of form, style, characterization, discovery, and reversal. Includes practice in analyzing plays of various forms and styles. **THTRE-370-0-1007**

THTRE 475. Opera Workshop. (1-6) Principles and techniques of operatic and musical theatre production, with emphasis on class rehearsal and performance of selected scenes from opera and musical drama; brief survey of the history of opera. Offered jointly by the Departments of Speech and Music. Same as **MUSIC 475**. **THTRE-475-0-0-1007**

Undergraduate and graduate credit in minor field

THTRE 560. Advanced Stage Movement. (3) Study in the physical development of character and advanced techniques of stage movement. May be repeated for a total of 9 hours credit by qualified students. Pr.: **THTRE 260** and one semester of ballet or modern dance. **THTRE-560-1-1007**

THTRE 561. Vocal Expression for Actors. (3) Studies and application of vocal techniques for stage productions; emphasis on development of the actor's vocal mechanism. May be repeated for a total of 9 hours credit by qualified students. Pr.: Consent of instructor. **THTRE-561-1-1007**

THTRE 562. Playwriting. (3) Theoretical study and practical application of techniques of playwriting with regard to plot, characters, and production; emphasis on the one-act form. **THTRE-562-0-1007**

THTRE 563. Storytelling. (2) A consideration of literary materials appropriate for children in nursery schools, kindergarten, and elementary schools. Major emphasis is on training in the art of storytelling. Pr.: **SPCH 105** or **106**. **THTRE-563-0-1007**

THTRE 565. Principles of Directing. (3) Principles and techniques of directing for the theatre; the historical emergence of the director; study of current theories. Pr.: **THTRE 261**. **THTRE-565-1-1007**

THTRE 566. Rehearsal Techniques. (0-3) I, II. A laboratory course for students enrolled in performance and production classes. May be repeated for 6 hours. Pr.: Conc. enrollment in **THTRE 765** or **783** or **779**. **THTRE-566-2-1007**

THTRE 568. Fundamentals of Scene Design. (3) Examination of the role of scene design in theatre, elements and objectives of design. Development, presentation, and synthesis of design images with the scripted play. Pr.: **THTRE 368**. **THTRE-568-0-1007**

THTRE 570. The Musical Comedy. (3) On sufficient demand. The history of operetta and musical comedy from Offenbach to the present. Same as **MUSIC 570**. Pr.: **MUSIC 150** or **THTRE 165** or equiv. **THTRE-570-0-1007**

THTRE 572. History of Theatre I. (3) I. A survey of the development of the theatre from ancient times to 1700. Pr.: Junior standing and consent of instructor. **THTRE-572-0-1007**

THTRE 573. History of Theatre II. (3) II. A survey of the development of the theatre from 1700 to the present. Pr.: Junior standing or consent of instructor. **THTRE-573-0-1007**

Undergraduate and graduate credit

THTRE 660. Professional Theatre Tour. (2-3) Intersession, S. Supervised viewing and analysis of professional theatre productions. Travel to one or more theatre centers such as New York, London, or Los Angeles. Students are charged an additional fee to cover travel expenses. Written critical reviews of the productions are required. May be repeated once by undergraduates. Pr.: Six hours of credit in theatre. **THTRE-660-2-1007**

THTRE 661. Professional Development. (1) I. Study of audition techniques including supervised preparation of appropriate material. Business aspects of professional theatre, including unions, contracts, and professional ethics. Pr.: 12 hours in theatre, music, and/or dance. **THTRE-661-1-1007**

THTRE 664. Creative Dramatics. (3) The development of creative imagination and personal well-being through theatre games, improvisation, role playing, and simulation. The use of drama in recreational and educational settings. Improvisation in performing scripted drama. Pr.: Junior standing. **THTRE-664-1-1007**

THTRE 665. Theatre for Special Populations. (3) Theory and practice of creative dramatics and theatre production for special populations; individualized reading and projects for particular populations such as the handicapped or the elderly. Pr.: Junior standing. **THTRE-665-0-1007**

THTRE 666. Stage Management. (3) I, II. Theory and practice of stage management in the professional and nonprofessional theatre. Emphasis is on the organization of all areas of theatre knowledge needed for the running of theatrical productions. Pr.: **THTRE 266**. **THTRE-666-0-1007**

THTRE 667. History of Costume for the Theatre. (3) I. A study of Western dress from antiquity to the present as it pertains to theatrical costumes. Emphasis on practical aspects for historical reproduction of clothing. Pr.: Junior standing or consent of instructor. **THTRE-667-0-1007**

THTRE 671. History of Opera. (3) A study of selected masterpieces of musical drama, with emphasis on the relationship of music and drama, and on the unique qualities of opera as a collective artwork. Pr.: **MUSIC 201** or **MUSIC 250** or **THTRE 370**. Same as **MUSIC 650**. **THTRE-671-0-1007**

THTRE 672. American Ethnic Theatre. (3) Drama and stagecraft of ethnic groups in the United States, including the theatre of African, Asian, Hispanic, Jewish, and Native Americans. Pr.: Junior standing. **THTRE-672-0-1007**

THTRE 710. Practicum in Theatre. (0-6) Supervised participation in a position of major responsibility. May be repeated for a maximum of 12 hours credit. Pr.: **THTRE 160** or **261** or **368**; junior standing; consent of supervising faculty member and approval of faculty members are required. **THTRE-710-2-1007**

THTRE 711. Topics in Technical Theatre. (3) Selected topics in creative techniques and investigation for technical theatre. May be repeated for credit with change in topic. Pr.: **THTRE 368** and consent of instructor. **THTRE-711-0-1007**

THTRE 712. Theatre Management. (3) Theatre management, promotion, finance, organization; emphasis on contract negotiations and use of facilities. **THTRE-712-0-1007**

THTRE 761. Advanced Acting. (3) Studies in style, technique, and characterization. May be repeated once. Pr.: **THTRE 361** and consent of instructor. **THTRE-761-1-1007**

THTRE 762. Advanced Playwriting. (3) Further study in the writing of drama; emphasis on problems of writing full-length plays. May be repeated for a total of 9 hours credit by qualified students. Pr.: Consent of instructor. Same as **ENGL 762**. **THTRE-762-0-1007**

THTRE 763. Reader's Theatre. (3) The nature, purpose, and production of oral interpretation of literature in the theatre; emphasis on monologue, lecture-recital, and play reading. May be repeated for a total of 6 hours credit by qualified students. Pr.: Consent of instructor. THTRE-763-1-1007

THTRE 764. Early American Theatre. (3) Studies in the drama and stagecraft of the colonies and the United States from the beginnings to 1900. Pr.: Junior standing. THTRE-764-0-1007

THTRE 765. Practice in Directing. (3) A lec.-lab course with emphasis on directing dramatic productions under performance conditions. May be repeated for a total of 9 hours credit by qualified students. Pr.: Consent of instructor. THTRE-765-1-1007

THTRE 766. Advanced Technical Production. (3) A lec.-lab course in advanced technical theatre problems of organization, planning, and execution of scenery, costumes, and lighting. May be repeated for a total of 9 hours credit by qualified students. Pr.: Consent of instructor. THTRE-766-1-1007

THTRE 767. Theatre Costume Design. (3) II. Studies in theory and practice of costume design for the theatre. May be repeated for a total of 6 hours credit by qualified students. Pr.: THTRE 367 or consent of instructor. THTRE-767-1-1007

THTRE 768. Scene Design. (3) Principles and styles of design for the stage, using sketches, diagrams, plates, and models. May be repeated for a total of 6 hours credit by qualified students. Pr.: Consent of instructor. THTRE-768-0-1007

THTRE 769. Stage Lighting. (3) I, II. Theory and practice of production lighting design, control systems, projection equipment, and lighting consulting. May be repeated for a total of 6 hours credit by qualified students. Pr.: THTRE 368 or 269. THTRE-769-1-1007

THTRE 777. Aesthetics of the Theatre. (3) Principal emphasis on theoretical problems of dramatic art. THTRE-777-0-1007

THTRE 778. History of the Physical Stage. (3) A survey course in the emergence and development of the theatre building as a distinct architectural form, with particular emphasis on the effect of the physical environment on the play. Pr.: THTRE 368. THTRE-778-0-1007

THTRE 779. Repertory Theatre. (3) Concentrated studies in theory and practice of repertory theatre productions. Reading, demonstrations, study of play scripts; play selection and production methods; operation of and assistance in production of plays in repertory. May be repeated for a total of 12 hours credit by qualified students. Pr.: Consent of instructor. THTRE-779-2-1007

THTRE 780. Theatre Technical Direction. (3) II, in alternate years. Lec.-lab course providing study of theatrical engineering systems. Pr.: THTRE 368 and consent of instructor. THTRE-780-0-1007

THTRE 782. Women in Theatre. (3) A history of the contributions made by women in theatre as playwrights, managers, directors, and performers; contemporary women in theatre and their experiments in expressing women's consciousness. THTRE-782-0-1007

THTRE 783. Practice in Acting. (3) Advanced studies in characterization with emphasis on communicating with the director. Taught in conjunction with the Practice in Directing workshop. May be repeated once. Pr.: THTRE 361 and consent of instructor. THTRE-783-1-1007

Graduate credit

THTRE 862. Workshop in Playwriting. (3) Advanced writing of drama. May be repeated once for credit. Same as ENGL 862. Pr.: THTRE 762 (or ENGL 762) or proof of equiv. proficiency. THTRE-862-0-1007

THTRE 870. Greek and Roman Theatre. (3) Studies in the drama and stagecraft of the Greek and Roman period. Pr.: THTRE 572. THTRE-870-0-1007

THTRE 871. Medieval and Baroque Theatre. (3) Studies in the drama and stagecraft of the Medieval and Baroque periods. Pr.: THTRE 572. THTRE-871-0-1007

THTRE 873. Modern European Theatre. (3) Studies in the European drama and stagecraft of the period from 1876 to the end of World War II. Pr.: THTRE 573. THTRE-873-0-1007

THTRE 874. Avant-Garde Theatre. (3) Studies in avant-garde drama and stagecraft since World War II to 1968. Pr.: THTRE 573. THTRE-874-0-1007

THTRE 875. Contemporary Theatre. (3) Studies in drama and stagecraft since 1968. Pr.: THTRE 573. THTRE-875-0-1007

THTRE 876. Seminar in Theatre. (3) Selected topics in theatre research. May be repeated for credit with change of topic. Pr.: THTRE 572 or 573. THTRE-876-0-1007

Courses in dance

Undergraduate credit

DANCE 120. Modern Dance I. (2) I, II. Introduction to principles of modern dance. Emphasis on correct body alignment, movement efficiency, and creative potential of the individual. Three hours lab a week. DANCE-120-5-1008

DANCE 165. Ballet I. (2) I, II. Introduction to basics of classical ballet training. Includes terminology, body positions, movement vocabulary, and principles of body alignment. DANCE-165-6-1008

DANCE 171. Jazz Dance I. (2) I, II. A basic course in jazz technique and style, focusing on isolations, rhythmic articulation, and the control and release of energy. Three hours lab a week. DANCE-171-5-1008

DANCE 205. Dance as an Art Form. (3) I. Dance in its religious, social, and artistic forms. Film, slides, demonstrations, and lectures will trace the function of dance in society, the influence of society on dance, how dance relates to other art forms, and current trends in the dance world. DANCE-205-0-1008

DANCE 222. Movement Improvisation. (1) On sufficient demand. Provides the opportunity to: discover personal creative sources for spontaneous movement; increase movement self-confidence in informal group settings; rediscover "play" through movement; and explore basic principles of movement improvisation—space, weight, shape, and time. Pr.: Consent of instructor. DANCE-222-1-0-1008

DANCE 250. Performance Styles. (1) Study and practice of technique and performance of specific period/historical, character, or ethnic/specialty dance styles. May be repeated three times. DANCE-250-1-0-1008

DANCE 295. Dance Composition I. (3) On sufficient demand. Introduction to the principles of the choreographic craft. Practical experience in development of movement phrases. Culminating presentation and critique of work. DANCE-295-1-1-1008

DANCE 321. Variations and Partnering. (1) On sufficient demand. Directed study in the principles of partnering and repertoire performance in various styles and forms of choreography. Pr.: Consent of instructor. DANCE-321-1-0-1008

DANCE 323. Modern Dance II. (2) I, II. May be repeated for a total of 8 hours. Only 2 of these hours may be applied toward humanities requirements. Pr.: DANCE 120 and consent of instructor. DANCE-323-1-0-1008

DANCE 324. Modern Dance III. (2) I, II. May be repeated for a total of 8 hours. Only 2 of these hours may be applied toward humanities requirements. Pr.: DANCE 323 and consent of instructor. DANCE-324-1-0-1008

DANCE 325. Ballet II. (2) I, II. May be repeated for a total of 8 hours. Only 2 of these hours may be applied toward humanities requirements. Pr.: DANCE 165 and consent of instructor. DANCE-325-1-0-1008

DANCE 326. Ballet III. (2) I, II. May be repeated for a total of 8 hours. Only 2 of these hours may be applied toward humanities requirements. Pr.: DANCE 325 and consent of instructor. DANCE-326-1-0-1008

DANCE 371. Jazz Dance II. (2) I, II. Intermediate course in jazz technique and style focusing on development of isolations, rhythmic articulation, and the control and release of energy. Performance of advanced movement sequences. May be repeated for a total of 8 hours. Only 2 of these hours may be applied toward humanities requirements. Pr.: DANCE 171. DANCE-371-1-0-1008

DANCE 372. Jazz Dance III. (2) On sufficient demand. May be repeated for a total of 8 hours. Only 2 of the hours may be applied toward humanities requirements. Pr.: DANCE 371 or consent of instructor. DANCE-372-1-0-1008

DANCE 380. Musical Stage Dance. (2) On sufficient demand. Technique and performance of musical stage dance. Rehearsal and performance of selected musical stage choreography. Pr.: DANCE 120, 165, or 171. DANCE-388-1-0-1008

DANCE 405. Applied Movement Fundamentals. (3) Study, analysis, and application of movement theory for the performer. Anatomical and kinesiological principles with practical application to major movement/dance, alignment, and neuromuscular repatterning theories for the performer, creator, and educator. Two hours lecture and two hours lab a week. Pr.: BIOL 240. DANCE-405-0-1008

DANCE 459. History of Dance in Its Cultural Setting. (3) II. The study of developments and changes in the style, technique, and purpose of ceremonial and theatrical dancing from the Greeks to the present. Emphasis on the interaction between this art and the total culture—social, religious, artistic, and political—in which it is performed. Pr.: Sophomore standing. Same as HIST 459. DANCE-459-0-1008

DANCE 495. Dance Composition II. (3) On sufficient demand. Advanced training and directed experiences in dance composition. Development of theme, phrasing, and style with particular emphasis on group forms. Pr.: DANCE 295. DANCE-495-1-1-1008

DANCE 498. Honors Tutorial in Dance. (1-3) I, II. Individually directed research/creative endeavor in dance, normally as a preliminary to writing a senior honors thesis. May be repeated once to a total of 3 hours. Pr.: Sophomore standing, membership in the honors program of the College of Arts and Sciences, and permission of instructor. DANCE-498-0-1008

DANCE 499. Senior Honors Thesis. Open only to seniors in the arts and sciences honors program. DANCE-499-0-1008

Undergraduate and graduate credit in minor field

DANCE 502. Performance Production. (1-2) I, II. Studies in the techniques of dance production and performance. Emphasis is on practical application. May be repeated four times. Pr.: Junior standing or consent of instructor. DANCE-502-1-0-1008

DANCE 504. Performance Aesthetics. (3) On sufficient demand. Examination of performance as art. Analysis of general aesthetic theory to performance through such issues as style, content, form, gender, and role. Oral and written experience in planning, executing, and assessing performance events. Pr.: Junior standing or consent of instructor. DANCE-504-0-1008

DANCE 505. Methods and Materials of Teaching Dance. (2) On sufficient demand. An in-depth survey of the development of dance education and a practical examination of dance for its educative, artistic, disciplinary, and therapeutic values. Emphasis on role of dance education, pedagogy, and advocacy. Pr.: DANCE 205, 405, and 504 or consent of instructor. DANCE-505-1-5-1008

DANCE 506. Dance Education Fieldwork. (1) On sufficient demand. A semester of supervised fieldwork incorporating dance as an educative tool in the classroom, in a therapeutic setting, or in an advocacy position. Application of dance education theory under faculty supervision and conference. Pr.: DANCE 505. DANCE-506-2-1008

DANCE 510. Senior Project. (2) On sufficient demand. Culminating project which entails research, creative process, or a documented fieldwork experience; concept through public presentation. Pr.: Senior standing and consent of instructor. DANCE-510-4-1008

DANCE 599. Independent Studies in Dance. (1-3) Selected topics in dance. Maximum of 3 hours applicable toward degree. Pr.: Consent of department head. DANCE-599-3-1008

DANCE 690. Senior Honors Thesis. Open only to seniors in the arts and sciences honors program. DANCE-690-4-0835

Statistics

George A. Milliken,* Head

Professors Feyerherm,* Higgins,* Johnson,* Kemp,* Milliken,* Nassar,* Nelson,* Perng,* and Yang;* Associate Professors Boyer* and S. McNulty;* Assistant Professors Neill,* and Schwenke;* Emeritus: Professor Fryer.

Undergraduate study

Statistics is a combination of classical mathematics, the theory of probability, and some new concepts related to inductive reasoning which have developed during the past three-quarters of a century.

Almost all activities of plants and animals (including man) depend to some degree on chance events, and most decisions made by mankind depend on sampling information—which also depends on chance events, and hence on probability. Consequently, the field of interest and activity for a statistician potentially is very broad.

Likewise, the professional activities open to a trained statistician are quite varied. The existence of modern-day computers relieves the statistician of tedious computations and elevates his professional activity to dealing with people and/or engaging in basic research.

A person wishing to major in statistics may seek a bachelor of arts degree or a bachelor of science degree by satisfying the general requirements of that degree, and completing the following:

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| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
| MATH 221 | Analytic Geometry and Calculus II .. | 4 |
| MATH 222 | Analytic Geometry and Calculus III .. | 4 |
| MATH 541 | Applied Matrix Theory .. | 3 |
| CIS 200 | Fundamentals of Computer Programming .. | 2 |
| CIS 207 | PASCAL Language Laboratory .. | 2 |
| CIS 300* | Algorithmic Processes .. | 3 |
| CIS 500* | Data Structures .. | 3 |
| CIS 560* | Introduction to Data Management Systems .. | 3 |
| STAT 410 | Probabilistic Systems Modelling .. | 3 |

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| STAT 510 | Introductory Probability and Statistics I .. | 3 |
| STAT 511 | Introductory Probability and Statistics II .. | 3 |
| STAT 704 | Analysis of Variance and Covariance .. | 2 |
| STAT 705 | Regression and Correlation Analyses .. | 2 |
| STAT 720 | Design of Experiments .. | 3 |
| IE 541 | Statistical Quality Control .. | 3 |
| Statistics elective (STAT 710, 716, 717, or 718) .. | | 2 |
| ENGL 416 | Written Communication for the Sciences .. | 3 |

*Or other approved science sequence.

Graduate study

The Department of Statistics offers graduate studies leading to the master of science and doctor of philosophy degrees in probability and statistics.

Many graduate majors in statistics have majored in some other area as undergraduates. If the student has had mathematics through the calculus and 12 additional credits in mathematics and/or statistics, the master's degree in statistics can be earned in the normal time.

Persons who have earned the master's degree in statistics may study toward the doctor's degree, enter industry or governmental service, or join organizations which do scientific research. Holders of the master's degree also may be teachers in some colleges and universities, but it is preferable to plan to obtain the doctorate if the student wishes to enter the teaching profession at the college or university level.

A student may work toward a doctor of philosophy degree either in mathematical probability and statistics or in applied probability and statistics. The former includes more of the advanced theory whereas the latter replaces some of the advanced theory with instruction and experience in the uses to which the basic theory can be put.

Teaching and research assistantships are available on a competitive basis. Federal fellowships also are available to excellent students upon application directly to the agency offering such fellowships.

Courses in statistics

Undergraduate credit

STAT 300. Sophomore Honors Seminar In Statistics. (3) I. Selected topics. May be used to satisfy quantitative requirements for B.S. degree. Open only to students in the honors program. STAT-300-0-1702

STAT 320. Elements of Statistics. (3) I, II. A basic first course in probability and statistics; frequency distributions; averages and measures of variation; probability; simple confidence intervals and tests of significance appropriate to binomial and normal populations; correlation and regression, including confidence intervals and tests of significance for bivariate populations. Pr.: MATH 100. STAT-320-0-1702

STAT 330. Elementary Statistics for the Social Sciences. (3) I, II, S. A basic first course in probability and statistics with textbook, examples, and problems aimed toward the social sciences and humanities. Frequency distributions, averages, measures of

variation, probability, confidence intervals; tests of significance appropriate to binomial, multinomial, and normal sampling; simple regression and correlation. Pr.: MATH 100. Cannot be taken for credit if credit has been received for STAT 320, 340, or 350. STAT-330-0-1702

STAT 340. Biometrics I. (3) I, II. A basic first course in probability and statistics with textbook, examples, and problems aimed toward the biological sciences. Frequency distributions, averages, measures of variation, probability, confidence intervals; tests of significance appropriate to binomial, multinomial, Poisson, and normal sampling; simple regression and correlation. Pr.: MATH 100. Cannot be taken for credit if credit has been received for STAT 320, 330, or 350. STAT-340-0-1702

STAT 341. Biometrics II. (3) II. Analysis and interpretation of biological data using analysis of variance, analysis of covariance, and multiple regression. Negative binomial distribution and its applications. Pr.: STAT 320, 330, 340, or 350. STAT-341-0-1702

STAT 350. Business and Economic Statistics I. (3) I, II, S. A basic first course in probability and statistics with textbook, examples, and problems pointed toward business administration and economics. Frequency distributions, averages, index numbers, time series, measures of variation, probability, confidence intervals, tests of significance appropriate to binomial, multinomial, Poisson, and normal sampling; simple regression and correlation. Pr.: MATH 100. Cannot be taken for credit if credit has been received for STAT 320, 330, or 340. STAT-350-0-1702

STAT 351. Business and Economic Statistics II. (3) I, II, S. Continuation of STAT 350 including study of index numbers, time series, business cycles, seasonal variation, multiple regression and correlation, forecasting; some nonparametric methods applicable in business and economic studies. Pr.: STAT 320, 330, 340, or 350. STAT-351-0-1702

STAT 410. Probabilistic Systems Modeling. (3) I, II. Basic probability; discrete and continuous random variables; Markov chains; Poisson process; birth and death process; applications for queuing theory and reliability theory; computer simulation of random phenomena. Pr.: MATH 221, CIS 300, 570, or consent of instructor. STAT-410-0-1702

STAT 490. Statistics for Geology. (1) I. First course in statistics with examples and problems aimed toward geology. Distributions, measures of means, measures of variation, confidence intervals, test of hypothesis, simple regression and correlation. Pr.: Open only to juniors and seniors in geology. Must be taken conc. with GEOL 490. STAT-490-0-1702

Undergraduate and graduate credit in minor field

STAT 510. Introductory Probability and Statistics I. (3) I, II. Descriptive statistics, probability concepts and laws, sample spaces; random variables; binomial, uniform, normal, and Poisson; two-dimensional variates; expected values; confidence intervals; binomial parameter, median, normal mean, and variance; testing simple hypotheses using CIs and X^2 ; goodness of fit. Numerous applications. Pr.: MATH 222. STAT-510-0-1702

STAT 511. Introductory Probability and Statistics II. (3) I, II. Law of Large Numbers, Chebycheff's Inequality; continuation of study of continuous variates; uniform, exponential, gamma, and beta distribution; Central Limit Theorem; distributions from normal sampling; introduction to statistical inference. Pr.: STAT 510. STAT-511-0-1702

STAT 550. Basic Elements of Statistical Theory. (3) I. The mathematical representation of frequency distributions, their properties, and the theory of estimation and hypothesis testing. Elementary mathematical functions illustrate theory. Pr.: MATH 220. STAT-550-0-702

Undergraduate and graduate credit

STAT 702. Statistical Methods for Social Sciences. (3) I, II. Statistical methods applied to experimental and survey data from social sciences; test of hypotheses concerning treatment means; linear regression; product-moment, rank, and bi-serial correlations; contingency tables and chi-square tests. Pr.: MATH 100. STAT-702-0-1702

STAT 703. Statistical Methods for Natural Scientists. (3) I, II, S. Statistical concepts and methods basic to experimental research in the natural sciences; hypothetical populations; estimation of parameters; confidence intervals; parametric and nonparametric tests of hypotheses; linear regression; correlation; one-way analysis of variance; t-test; chi-square test. Pr.: Junior standing and equiv. of college algebra. STAT-703-0-1702

STAT 704. Analysis of Variance and Covariance. (2) I, II, S. Computation and interpretation for two- and three-way analyses of variance; multiple comparisons; analysis of covariance; applications including use of computers. Meets four times a week during first half of semester. Pr.: One previous statistics course. STAT-704-0-1702

STAT 705. Regression and Correlation Analyses. (2) I, II, S. Multiple regression and correlation concepts and methods; curvilinear regression; applications including use of computers. Meets four times a week during second half of semester. Pr.: One previous statistics course. STAT-705-0-1702

STAT 707. Applied Linear Statistical Models. (3) I. A unified approach to the application of linear statistical models in regression, analysis of variance and covariance, basic experimental design problems and their application in management, management sciences, and social sciences. Use of residual analysis for examining the aptness of models. Pr.: Six semester hours of statistics or STAT 702. STAT-707-0-1702

STAT 708. Use of Statistical Computer Packages. (1) Intercession only. Processing data sets using SAS (Statistical Analysis System) for analysis of variance, regression and correlation analysis, chi-square, multivariate statistical analyses, and graphic displays using both the line printer and Calcomp plotter. Pr.: STAT 704, STAT 705, or consent of instructor. STAT-708-0-1702

STAT 710. Sample Survey Methods. (2) II, in even years. Design, conduct, and interpretation of sample surveys. Pr.: STAT 702 or 703. Meets four times a week during first half of semester. STAT-710-0-1702

STAT 716. Nonparametric Statistics. (2) II, in even years. Hypothesis testing when form of population sampled is unknown: rank, sign, chi-square, and slippage tests; Kolmogorov and Smirnov type tests; confidence intervals and bands. Meets four times a week during second half of semester. Pr.: One previous course in statistics. STAT-716-0-1702

STAT 717. Categorical Data Analysis. (2) II. Analysis of categorical data arranged in two and higher-dimensional contingency tables using classical methods and log linear models. Various measures of association are discussed. Meets four times a week during first half of semester. Pr.: STAT 704, 705. STAT-717-0-1702

STAT 718. Survival Data Analysis. (2) II, in odd years. Estimation and comparison of survival functions with identification of prognostic and risk factors using some nonparametric techniques with application to life-testing and survival data. Meets four times a week during second half of semester. Pr.: STAT 704, 705. STAT-718-0-1702

STAT 720. Design of Experiments. (3) I, S. Planning experiments so as to minimize error variance and avoid bias; Latin squares; split-plot designs; switch-back or reversal designs; incomplete block designs; efficiency. Pr.: STAT 704 and 705. STAT-720-0-1702

STAT 725. Digital Statistical Analysis. (3) II. Use of FORTRAN to implement algorithms for computing statistical analyses of data including means, standard deviations, correlations, regression, and analysis of variance. Generation of pseudo random numbers, probability distributions, and simulation techniques. Writing SAS procedures in FORTRAN. Use of the calcomp plotter for data display. JCL (Job Control Language) used to create disk and tape files and to create load modules. Pr.: CIS 201 and STAT 704 and 705, or conc. enrollment. STAT-725-0-1702

STAT 730. Multivariate Statistical Methods. (3) I. Multivariate analysis of variance and covariance; classification and discrimination; principal components and introductory factor analysis; canonical correlation; digital computing procedures applied to data from natural and social sciences. Pr.: STAT 704, 705. STAT-730-0-1702

STAT 735. Statistics in Health Related Industries. (2) I, in odd years. Case studies and selected literature of applications of statistics to problems in the pharmaceutical and health-related industries are discussed. Topics include pharmacokinetic analysis, covariance analysis, crossover studies, bioequivalence. Meets four times a week during first half of semester. Pr.: STAT 704, 705, 720. STAT-735-0-1702

STAT 736. Bioassay. (2) I, in odd years. Direct assays; quantitative dose-response models; parallel line assays; slope ratio assays; experimental designs for bioassay; covariance adjustment; weighted estimates; assays based on quantal responses. Meets four times a week during second half of semester. Pr.: STAT 704, 705. STAT-736-0-1702

STAT 740. Nonlinear Models. (3) S, in even years. Methods of estimating parameters of nonlinear models; procedures for testing hypotheses; construction of confidence intervals and regions; nonlinear analysis of covariance; quantal dose response and probabilistic choice models. Pr.: MATH 222, STAT 720. STAT-740-0-1702

STAT 745. Advanced Regression Analysis. (2) I, in even years. Tests of linear restrictions; residual diagnostics; tests and corrections for heteroscedasticity, autocorrelated errors, errors in variables; consequences of stochastic regressors and multicollinearity; alternatives to least squares; instrumental variable estimators and systems of equations; random coefficients. Meets four times a week during first half of semester. Pr.: STAT 705. STAT-745-0-1702

STAT 746. Graphical Methods for Data Analysis. (2) I, in even years. This is a study of visual portrayals of quantitative information. Topics include graphical display of raw data and quantities derived from the data, the use of statistical graphics to analyze data, exploratory methods, multidimensional methods, and methods for studying data in the context of statistical models. Meets four times a week during second half of semester. Pr.: STAT 704 and 705 or equiv. STAT-746-0-1702

STAT 770. Theory of Statistics I. (3) I. Probability models, concepts of probability, random discrete variables, moments and moment generating functions, bivariate distributions, continuous random variables, sampling, Central Limit Theorem, characteristic functions. More emphasis on rigor and proofs than in STAT 510 and 511. Pr.: MATH 222. STAT-770-0-1702

STAT 771. Theory of Statistics II. (3) II. Introduction to multivariate distributions; sampling distributions, derivation, and use; estimation of parameters, testing hypothesis; multiple regression and correlation; simple experimental designs; introduction to nonparametric statistics; discrimination. Pr.: STAT 770. STAT-771-0-1702

STAT 799. Topics in Statistics. (Var.) I, II, S. Pr.: STAT 703 or 770 and consent of instructor. STAT-799-3-1702

Graduate credit

STAT 810. Seminar in Probability and Statistics. (1) I, II. Discussion and lectures on topics in probability and statistics; one seminar talk by each student registered for credit. Pr.: Graduate standing and at least two graduate courses in statistics. STAT-810-0-1702

STAT 816. Nonparametric Theory and Robustness. (3) I, in even years. Hodges-Lehman estimators; L-estimator; M-estimator; distribution-free confidence, prediction, and tolerance intervals; jackknife and bootstrap methods; U-statistics; linear rank statistics; two-sample problems; Pitman's asymptotic relative efficiency; k-sample problems; testing independence; simple regression problem. Pr.: STAT 716 and 771. STAT-816-0-1702

STAT 840. Intermediate Probability and Approximation Theorems. (3) II. Probability measure, random variables, characteristic functions, modes of convergence, central limit theory, asymptotic properties of maximum likelihood estimators, likelihood ratio tests, sample moments, sample quantiles, order statistics, the empirical distribution function, and transformations of given statistics. Pr.: STAT 771 and MATH 633. STAT-840-0-1702

STAT 850. Stochastic Processes I. (3) II. Generating functions; conditional probability and conditional expectations; normal processes and covariance stationary processes; Poisson processes; renewal processes; Markov chains, discrete time. Pr.: STAT 770. STAT-850-0-1702

STAT 851. Stochastic Processes II. (3) I. Markov chains, discrete time; Markov chains continuous time; birth-death processes; Kolmogorov differential equations; diffusion processes, forward and backward Kolmogorov equations; applications. Pr.: STAT 850. STAT-851-0-1702

STAT 860. Linear Models I. (3) I. Subspaces, projections, and generalized inverses; multivariate normal distribution, distribution of quadratic forms; optimal estimation and hypothesis testing procedures for the general linear model; application to regression models, correlation model. Pr.: STAT 704, 705, 771; course in matrices. STAT-860-0-1702

STAT 861. Linear Models II. (3) II. Continued application of optimal inference procedures for the general linear model to multifactor analysis of variance, experimental design models, analysis of covariance, split-plot models, repeated measures models, mixed models, and variance component models; multiple comparison procedures. Pr.: STAT 860. STAT-861-0-1702

STAT 870. Analysis of Messy Data. (3) II. Design structures; treatment structures; equal and unequal variances; multiple comparisons; unequal subclass numbers; missing cells; interpretation of interaction; variance components; mixed models; split-plot and repeated measures; analysis of covariance; cross-over designs. Pr.: STAT 720. STAT-870-0-1702

STAT 880. Time Series Analysis. (3) I, in odd years. Autocorrelation function; spectral density; autoregressive integrated moving average processes; seasonal time series; transfer function model; intervention analysis; regression model with time series error. Pr.: STAT 705 and 770. STAT-880-0-1702

STAT 898. Master's Report. (2) I, II, S. Pr.: Consent of instructor. STAT-898-4-1702

STAT 899. Master's Thesis Research. (Var.) I, II, S. Pr.: Consent of instructor. STAT-899-4-1702

STAT 918. Theory of Life-Data Analysis. (3) II, in even years. A study of models and inferential procedures important to life-data analysis. Comparison of estimators (MLE, BLUE, etc.). Pivotal quantities. Design and regression models for non-normal distributions. Analysis of censored data. Pr.: STAT 840 and 861. STAT-918-0-1702

STAT 920. Experimental Design Theory. (3) II, in odd years. Incomplete block designs; theory of the construction and analysis of experimental designs. Pr.: STAT 720 and 861. STAT-920-0-1702

STAT 925. Computational Statistics. (3) I, in odd years. Seminumerical and numerical methods used in computational statistics. Application areas include linear and nonlinear least squares methods, unconstrained and constrained nonlinear function optimization, robust estimation, and classical multivariate analysis. Emphasis on the most recent advances in these and other areas supported by computational statistics. Pr.: STAT 725 and 861. STAT-925-0-1702

STAT 930. Theory of Multivariate Analysis. (3) II, in odd years. The multivariate normal distribution, the Wishart distribution, Jacobians of vector and matrix transformations, Hotelling's T^2 -statistic, the union-intersection principle, tests on mean vectors and covariance matrices, Box's approximations to critical points, the multivariate general linear model, discriminant analysis, and principal component analysis. Pr.: STAT 730 and 861. STAT-930-0-1702

STAT 945. Problems in Statistical Consulting. (Var.) I, II, S. Principles and practices of statistical consulting. Supervised experience in consultation and consequent research concerning applied statistics and probability associated with on-campus investigations. Pr.: STAT 704, 705, and 771. STAT-945-2-1702

STAT 950. Advanced Studies in Probability and Statistics. (Var.) I, II, S. Theoretical studies of advanced topics in probability, decision theory, Markov processes, experimental design, stochastic processes, or advanced topics. May be repeated. Pr.: STAT 771. STAT-950-0-1702

STAT 990. Probability Theory. (3) I, in even years. Probability spaces and random variables; distribution functions; moments and inequalities; characteristic functions; stochastic independence; convergence of a sequence of distribution functions; the four types of convergence; convergence of the sum of independent random variables; laws of large number; central limit theorems; conditional expectations and martingales. Pr.: STAT 840 and MATH 722. STAT-990-0-1702

STAT 995. Advanced Inference I. (3) I. Statistical decision rules; utility, loss, and risk functions; Bayes and minimax analyses; admissibility, complete classes; sufficiency, completeness, unbiased estimation; equivariance, location-scale families; maximum likelihood estimation; information inequality. Pr.: STAT 771, 840. STAT-995-0-1702

STAT 996. Advanced Inference II. (3) II. Neyman-Pearson lemma, monotone likelihood ratio, uniformly most powerful tests; confidence bounds; unbiasedness and invariance for hypothesis testing; sequential probability ratio tests. Pr.: STAT 995. STAT-996-0-1702

STAT 999. Research in Statistics. (Var.) I, II, S. Pr.: Consent of instructor. STAT-999-4-1702

Business Administration

David P. Donnelly,* Interim Dean
Robert D. Hollinger,* Associate Dean
Kay C. Stewart, Assistant Dean

110 Calvin Hall
532-7190

The main objective of the College of Business Administration is to provide a balanced program for general education and professional study in business administration and accounting.

The degree programs in business offered by the College of Business Administration, at both the undergraduate and graduate levels, are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

Throughout a student's academic career, the business firm is examined as a vital social, economic, and political institution. To equip the prospective executive and specialist for future professional responsibilities, the college organizes instructional activities around two themes: one, the businessperson as the manager and decision maker of operations in a particular firm; two, the businessperson as one who must analyze and adapt to the larger economic, social, and political environment of which he or she and the firm are integral parts. Both subject and instructional techniques focus on decision making and implementation of decisions through critical and creative analysis.

The College of Business Administration also sponsors numerous short courses and conferences for business and management groups.

At the undergraduate level, the College of Business Administration seeks to produce a graduate with a broad education in the arts, sciences, and humanities; a solid knowledge and understanding of the functioning of the business world; sufficient knowledge and skill in a field of specialization to obtain a position in business; and the proven ability to think creatively and analytically in order to progress into positions of greater responsibility in the future.

General Requirements

Bachelor of science in business administration

Business Administration Pre-Professions
Students entering college for the first time and eligible for admission to Kansas State University must enroll in the Business Administration Pre-Professions Program (BAPP). Students with previous academic work (either at Kansas State University or elsewhere) requesting transfer to the College of Business Administration must have a 2.0 or higher grade point average and enroll in the BAPP curriculum. For purposes of admission, grade point averages will be based on all courses attempted at colleges or universities.

The BAPP program provides course work in communications, mathematics, social sciences, humanities, and natural sciences. The purpose of the BAPP curriculum is to help the student develop the descriptive and analytical foundation of knowledge necessary for the study of business administration. Remaining "core courses" in business administration and courses in the five degree-track majors are taken after successful completion of the BAPP program.

The BAPP is expressly designed as a non-degree program; students with 90 or more credit hours will not be allowed to enroll in BAPP. Students with more than 90 hours who have consistently met the grade point requirements may be admitted into degree-track majors.

Admission to a degree-track major program in accounting, finance, general business, management, or marketing is necessary for graduation. Applicants for admission to one of the degree-track majors will be accepted upon completion of a minimum of 60 credit hours with an overall grade point average of 2.25 or above. The 60 credit hours must include the following courses or their approved equivalents:

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| BAPP requirements | 44 |
| ACCTG 211 Financial Accounting | 3 |
| ACCTG 221 Managerial Accounting | 3 |
| CIS 110 Introduction to Personal Computing | 3 |
| or | |
| CIS 200 Fundamentals of Computer Programming | 2 |
| CIS Computer Language (200 level) | 2 |
| ECON 110 Economics I | 3 |
| ECON 120 Economics II | 3 |
| ENGL 100 English Composition I | 3 |
| ENGL 120 English Composition II | 3 |
| HPER 101 Principles of Physical Fitness | 1 |
| MATH 100 College Algebra | 3 |

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| MATH 205 General Calculus and Linear Algebra | 3 |
| or | |
| MATH 220 Analytical Geometry and Calculus I .. | 4 |
| POLSC 325 U.S. Politics | 3 |
| PSYCH 110 General Psychology | 3 |
| SOCIO 211 Introduction to Sociology | 3 |
| SPCH 106 Public Speaking I | 3 |
| STAT 350 Business and Economic Statistics I .. | 3 |

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| Communications electives | 3 |
| Three hours selected from: | |
| ENGL 200 Intermediate Composition | 3 |
| ENGL 301 Writing and the Law: Legislative Analysis | 3 |
| GENBA 391 Administrative Communications ... | 3 |
| MKTG 422 Sales Communication | 3 |
| MLANG All modern language courses | 3 |
| SPCH 311 Business and Professional Speaking | 3 |
| SPCH 321 Public Speaking II | 3 |
| SPCH 325 Argumentation and Debate | 3 |
| SPCH 526 Persuasion | 3 |

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| Humanities electives | 6 |
| Six hours selected from: | |
| All courses in art,* history, modern languages, music,* philosophy, dance,* theatre;* ARCH 301; English: all literature plus four (230, 231, 233, 234) humanities courses. | |

*All courses from these areas are acceptable; however, one may take a maximum of 3 credit hours total from these four areas in participation or artistic skill development courses.

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| Natural science electives | 7 |
| Seven hours selected from: | |
| All courses in biochemistry, biology, chemistry, geology, and physics; ANTH 280, 281; DEN 420, 425; GEOG 220, 221. One laboratory course is required. | |

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The exact sequence of the courses to be taken is worked out between student and advisor. There is some flexibility in scheduling; to enroll in any course, students must have prerequisites as stated in the catalog.

Applications for a degree-track major must be made by November 15, April 1, or July 1 of the respective semester during which the student will have completed the 60-credit-hour pre-professional requirements. Decisions for admission will be made as soon as possible after the end of the semester.

Degree requirements

Candidates for the bachelor of science in business administration must complete at least 27 credit hours of resident instruction in upper-division courses after acceptance and enrollment in a degree-granting program in the college. Exceptions may be considered for those who have consistently exceeded a 2.25 grade point average on upper-division courses applied toward the degree. See additional residency requirements earlier in this catalog.

Program Options

Dual degree in business administration

The dual degree programs allow students to earn the bachelor of science in business administration degree in addition to a nonbusiness degree. Because of course sequence requirements, the student should begin the dual degree program in the sophomore year. Students must be enrolled in both the college offering the nonbusiness degree and the College of Business Administration.

Any student who wishes to complete a dual degree must take a minimum of 150 credit hours and satisfy the requirements for both degrees. The business administration requirements include course work in the following areas: communications, quantitative, social sciences, economics, and business. For further information about the exact academic requirements, contact the dean's office, College of Business Administration, 107 Calvin Hall, Manhattan, Kansas 66506-0501.

Associate of arts degree at Fort Riley (A.A.)

In cooperation with the Division of Continuing Education, the College of Business Administration offers an A.A. degree at Fort Riley, Kansas. This program is designed primarily for military personnel. Sixty-one semester hours of academic work are required to earn the degree. The requirements include work in communications; mathematics; computer science; social, behavioral, and natural sciences; humanities; economics; and business. For information about the exact academic requirements, write to Fort Riley Degree Program, Division of Continuing Education, College Court Building, Manhattan, Kansas 66506-6002.

Honors program

The College of Business Administration honors program enables students to further develop broad intellectual interests and investigate the latest issues and research related to business and industry.

Freshmen and sophomores eligible to participate in the honors program enroll in GENBA 299, Honors Colloquium; juniors and seniors enroll in GENBA 499, Honors Seminar.

One hour of unrestricted elective credit will be given upon completion of a semester program. A total of 8 credit hours may be earned. Completion of the College of Business Administration honors program requires earning a total of 3 credits in GENBA 499, honors seminar. At that time the honors program will be posted on the official transcript.

Pre-business education

Pre-business education majors are enrolled in and advised by the College of Education. Students interested in the field are instructed to refer to the College of Education section for details.

Pre-law

Law schools emphasize various objectives in pre-law study for the development of basic skills and insights. These objectives are: the acquisition of skills in comprehension and expression; understanding human institutions; and the ability to think clearly, carefully, and independently. A pre-law student enrolled in the College of Business Administration not only achieves these important goals, but also obtains a broad business background that is desirable preparation for the study of law.

Graduate study

The College of Business Administration provides graduate work leading to a master of business administration (M.B.A.) degree and a master of accountancy (M.Acc.) degree. Applications are welcomed from outstanding students with baccalaureate degrees in any field of study. Admission to these programs is granted to those students showing high promise of success in postgraduate business study. Following appraisal of prior scholastic performance, employment experience, and performance on the Graduate Management Admissions Test, the college's director of graduate studies, in consultation with the graduate studies committee, makes the admission recommendation to the Graduate School for the final review.

Admission with full standing requires that the applicant meet the following requirements of the Graduate School and the College of Business Administration:

1. A bachelor's degree from an approved institution.
2. Adequate undergraduate preparation for the intended major field of study or equivalent evidence of an appropriate background for undertaking an advanced degree. (Provisional admission may be granted to applicants who have subject deficiencies in undergraduate preparation.)
3. An undergraduate grade average of 3.0 or above for the junior and senior years.
4. For international students interested in the M.B.A., a score of at least 570 on the Test of English as a Foreign Language (TOEFL). M.Acc. applicants must have a 570 TOEFL and a score of 220 on the Test of Spoken English (TSE).
5. A satisfactory score on the Graduate Management Test (GMAT). An official record of the GMAT score must be sent by the ETS directly to the College of Business Administration.

6. Three letters of reference from former employers or professors.

7. A one-page statement of your objectives in pursuing the program.

Applications for graduate study should be submitted to the Director of Graduate Studies, College of Business Administration, 110 Calvin Hall, Manhattan, Kansas 66506-0501. Deadlines for completed applications are:

| Requested enrollment date | Deadline for completed application |
|---------------------------|--|
| Fall semester | July 15 (June 1 for international students) |
| Spring semester | December 15 (November 1 for international students) |
| Summer semester | May 1 (March 15 for international students) |

College of Business Administration courses numbered 800 and above may only be taken by students who have been admitted to a Kansas State University graduate program. Special graduate students and seniors who qualify for graduate credit may not enroll in courses numbered 800 and above in the College of Business Administration.

The Graduate School section of this catalog provides further information on the policies and procedures relating to graduate education at KSU.

Master of business administration

The master of business administration (M.B.A.) program at KSU provides professional managerial education to individuals who wish to pursue administrative careers in both the private and public sectors. The program combines practical and conceptual approaches to business to help students develop important managerial skills and expand their intellectual abilities. On a solid foundation of the tools of quantitative analysis, the program builds a management model that emphasizes creative decision making, risk taking, strong interpersonal skills, a global orientation, and good business values.

Before beginning the M.B.A. curriculum, students with undergraduate degrees without prior business education must acquire basic competency in the following areas: accounting, statistics, information systems, finance, management, marketing, and economics. These competencies should be acquired through graduate-level common body of knowledge (CBK) course work. The specific number of graduate CBK courses required depends on the applicant's prior academic work but generally should require no more than 27 credit hours. This basic CBK course work may be taken after admission to the M.B.A. program but must be completed prior to enrollment in the 33-hour graduate curriculum.

The M.B.A. curriculum is a 33-hour program of study that may be completed in two regular semesters and a summer session, or in three semesters. Entry into the program may be in the fall, spring, or summer semesters.

The 33-hour graduate curriculum is divided into two major sections. The first section comprises 24 hours of core courses. These eight required courses represent study across a broad spectrum of the functional areas of business. In addition, graduate students must take 9 hours in an area of concentration aimed at improving competence for overall management.

The specific courses to be taken for a concentration will be determined by the student and his or her supervisory committee and the director of graduate studies.

Possible areas of concentration include marketing, management, finance, and international business. Other possible areas for concentration can be determined by the student's program of study committee and the director of graduate studies.

M.B.A. curriculum

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| Common body of knowledge requirements 27 | |
| STAT 707 | Applied Linear Statistical Models |
| ACCTG 710 | Accounting Concepts and Analysis |
| FINAN 710 | Managerial Finance |
| MKTG 700 | Marketing Theory and Practice |
| MANGT 720 | Management of Organizations |
| MANGT 721 | Production and Operations Management |
| MANGT 766 | Introduction to Management Information Systems |
| MANGT 891 | Legal and Social Environment of Business |
| ECON 520 | Intermediate Microeconomics |

CBK courses will not be included in any area of the concentration.

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| Core courses 24 | |
| ACCTG 812 | Accounting Controls for Business |
| FINAN 850 | Advanced Managerial Finance |
| MKTG 840 | Advanced Marketing Management |
| MANGT 820 | Behavioral Management Theory |
| MANGT 893 | Business Operations Analysis |
| MANGT 866 | Advanced Management Information Systems |
| MANGT 888 | Administrative Strategy |
| ECON 840 | Managerial Economics |

Required MBA courses will not be included in any area of the concentration.

Area of concentration 9
Students must take 3 hours of 800-level and 6 hours of 600-level or higher College of Business Administration courses aimed at improving competence for overall management. One 3-hour economics course numbered 600 or higher may be taken in the concentration. The courses composing the 9-hour concentration should form a related or cohesive area of study. Exceptions for the CBA concentration course requirement may be made by the supervisory committee and director of graduate studies. The specific courses to be taken for a concentration will be determined by the student and his or her supervisory committee and the director of graduate studies. Students may not take a concentration in accounting. Students interested in accounting should enroll in the master of accountancy program. Concentrations are offered in marketing, finance, management, and international business.

Fellowships

Each year several fellowships are available to interested and qualified M.B.A. students through local business firms. In addition to stipends generally equivalent to those for 16-hour-per-week graduate assistantships, fellowship recipients can earn 3 credit hours while gaining managerial experience solving real business problems doing research and analysis for the sponsoring firm.

Assistantships

Many graduate teaching and research assistantships are available each year. Assistantships vary between 2/10 and 4/10 time, on a 40-hour/week basis for the nine-month academic year. Some assistantships also carry a partial fee waiver and a small number receive partial funding through the college work-study program. A student on a 4/10 time assistantship may not carry more than 12 credit hours per semester. Any applicants interested in obtaining an assistantship should request an application form from the director of graduate studies, College of Business Administration, 110 Calvin Hall, Manhattan, Kansas 66506-0501, (913) 532-7190.

Master of accountancy

The objective of the master of accountancy (M.Acc.) program is to provide candidates with greater breadth and depth in accounting education than is possible in the baccalaureate programs.

Graduates of the program should be prepared to research various data bases related to troublesome accounting problems and to exercise judgment in making accounting-related decisions by drawing on their integrated and comprehensive body of accounting knowledge.

Common body of knowledge prerequisites

Advanced study in accounting at KSU builds upon certain basic areas of knowledge that all degree candidates must satisfy. These basic areas constitute the common body of knowledge (CBK). In order to be admitted in full standing, each applicant must satisfy the CBK requirement, ordinarily through undergraduate course work. The CBK is defined by the following:

(a) A background of the concepts, processes, and institutions in the production and marketing of goods and/or services, and the financing of the business enterprises or other forms of organization. This portion of the CBK requirement is generally satisfied through a basic undergraduate course in each of three areas: marketing, finance, and production/operations management.

(b) A background of the economic and legal environment as it pertains to profit and/or nonprofit organizations along with ethical considerations and social and political influences as they affect such organizations. Examples of courses that satisfy these requirements are economics (6 hours are expected), political science, business law, and business, government, and society.

(c) A basic understanding of the concepts and applications of accounting, quantitative methods, and information systems.

This area of the CBK requirement may be met through course work in statistics, calculus, information systems, and accounting course work covering the accumulation of accounting data and the management uses of these data.

(d) A study of organization theory, behavior, and interpersonal communications. Course work in management, written and oral communication, sociology, and psychology are ordinarily used to satisfy this CBK requirement.

(e) A study of administrative processes under conditions of uncertainty including integrating analysis and policy determination at the overall management level.

A course in business strategy typically satisfies this requirement.

Students with an undergraduate degree who have not done any work in CBK areas should satisfy the CBK foundation course requirements by completing the following courses:

| | | |
|------------|--|---|
| ACCTG 211 | Financial Accounting | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| STAT 707 | Applied Linear Statistical Models . . | 3 |
| FINAN 710 | Managerial Finance | 3 |
| MKTG 700 | Marketing Theory and Practice . . . | 3 |
| MANGT 720 | Management of Organizations | 3 |
| MANGT 721 | Production and Operations Management | 3 |
| MANGT 766 | Introduction to Management Information Systems | 3 |
| MANGT 891 | Legal and Social Environment of Business | 3 |
| ECON 520 | Intermediate Microeconomics | 3 |
| MANGT 695* | Business Strategy | 3 |

*Not required if MANGT 888 is taken in the M.Acc. curriculum.

Accounting foundation courses

In addition to the CBK prerequisites, applicants must complete a minimum of 21 semester credits in the accounting discipline beyond principles of financial and management accounting. The 21 semester credits must include study in each of the following subjects. The KSU undergraduate course or courses which together satisfy each subject requirement are listed following each area. Comparable courses or combinations of courses from other schools may also satisfy the requirement.

| | |
|--|---|
| Financial accounting and accounting theory | |
| ACCTG 311 | Intermediate Accounting I 3 |
| ACCTG 321 | Intermediate Accounting II 3 |
| ACCTG 411 | Advanced Accounting 3 |
| Management accounting | |
| ACCTG 312 | Cost Accounting 3 |
| Management information and computer systems | |
| ACCTG 413 | Accounting Information Systems ... 3 |
| Financial and operational auditing | |
| ACCTG 421 | Auditing I 3 |
| Taxation | |
| ACCTG 422 | Taxation I 3 |
| Governmental and not-for-profit accounting | |
| ACCTG 412 | Public and Governmental Accounting 3 |

Each applicant's undergraduate transcripts (and previous graduate transcripts, if applicable) are analyzed for coverage of the CBK and accounting prerequisites. Provisional admission is granted to applicants who have subject deficiencies, which are then made up by enrolling in specified courses.

Generally, each candidate must complete the following program, including a comprehensive examination required in the final term of the student's program. Any exceptions must be arranged with the director of master accountancy studies.

M.Acc. required courses

| | |
|-------------------------|--|
| Required courses | |
| ACCTG 811 | Accounting Theory I 3 |
| ACCTG 812 | Accounting Controls for Business .. 3 |
| ACCTG 813 | Accounting Research 3 |
| FINAN 850 | Financial Controls for Business 3 |
| MKTG 840 | Advanced Marketing Management . 3 |

Management elective

| | |
|---|--|
| Select one (in consultation with the director of M.Acc. studies): | |
| MANGT 893 | Business Operations Analysis 3 |
| MANGT 820 | Behavioral Management Theory ... 3 |
| MANGT 890 | Decision Theory 3 |
| MANGT 866 | Advanced Management Information Systems 3 |
| MANGT 888 | Administrative Strategy 3 |

Accounting electives

| | |
|--|-----------------------------------|
| Select four (in consultation with the director of M.Acc. studies); two courses must be at the 800 level: | |
| ACCTG 711 | Taxation II 3 |
| ACCTG 722 | Advanced Auditing 3 |
| ACCTG 823 | Tax Planning and Research 3 |
| ACCTG 824 | Accounting Theory II 3 |
| ACCTG 825 | Contemporary Accounting 3 |

| | |
|--|-----------|
| Comprehensive examination | 0 |
| Minimum hours required for graduation | 30 |

It is recognized that different schools use different names for courses referred to above.

International Trade Institute

The International Trade Institute (ITI) was established in 1980 as an integral part of the College of Business Administration. It provides special resources to help meet the growing challenges of world trade.

ITI staff members work with students on supervised projects and internships, and counsel those interested in international careers. In addition, the institute has established a Collegiate International Trade Association (CITA) at KSU that provides interaction between students from the U.S. and foreign countries concerning global issues of current importance.

The International Trade Institute is involved in a multistate research effort in applied international marketing to improve information available to decision makers in business, government, and academia. The primary focus is on the development and evaluation of alternative trade strategies. Yearly conferences, seminars, and symposia are held to communicate the results of research and to promote discussion with recognized experts relevant to current international problems and opportunities.

Additional resources provided by the ITI, including a comprehensive library of international materials and computerized data services, are available to both students and faculty at KSU and to mid-American business executives. The ITI also cosponsors a bimonthly newsletter circulated to 9,500 businesses in the multistate area.

For further information, contact Dr. Raymond Coleman, director, International Trade Institute, 1627 Anderson Avenue, Manhattan, Kansas 66502, (913) 532-6799.

Small Business Development Center

The Small Business Development Center is part of a nationwide program that shares the knowledge base of universities with the needs of small business owners.

The center serves a 15-county area in north central Kansas and provides the following services:

Free individual, confidential counseling on a range of business topics; workshops and evening classes on business start-up, marketing, recordkeeping, and computers; and information services through a library of books, magazines, audio and video tapes, and computer data search services.

Specialized services available in conjunction with the services of the center include the Robert G. Chapman Small Business Computing Center, which utilizes state-of-the-art computer systems to teach business owners how to use computers in their businesses and supports a wide range of research projects; the Small Business Institute, which utilizes teams of seniors and graduate students to evaluate small businesses and recommend corrective strategies; and the Kansas Rural Enterprise Institute, which focuses research on the economic problems of businesses in rural areas and conducts specialized programs to foster start-up and growth of businesses throughout Kansas.

Summer Internships are offered to qualifying juniors or seniors in the College of Business Administration. Students may earn 3 credit hours through a qualifying summer work program with a cooperating business.

For assistance or information contact Frederick H. Rice, director, 204 Calvin Hall, Manhattan, Kansas 66506-0509, (913) 532-5529.

Accounting

Maurice E. Stark,* Head

Professor Stark;* Associate Professors Deines,* Donnelly,* Plumlee,* Thomas,* and Vruwink;* Assistant Professors Ainsworth, Ott,* and Robson; Instructors Haycock and Lyle; Emeriti: Professors Clark, Fox, and Laughlin; Associate Professor Gugler.

Accounting is often called the "language of business" as its terms and concepts are used to describe the daily events of business. The accountant measures and reports to various users the relevant financial information necessary for decision making.

The objective of the undergraduate accounting program is to provide basic conceptual accounting and business knowledge as a foundation for accounting career development in all areas. The program requirements which accomplish these objectives are specified below.

Requirements for major in accounting

| | |
|--|--|
| BAPP Program | 60 |
| (See general section of the College of Business Administration.) | |
| Business core courses | 25 |
| FINAN 450 | Business Finance 3 |
| MANGT 420 | Management Concepts 3 |
| MANGT 421 | Production Operations Management 3 |
| MANGT 466 | Management Information Systems 4 |
| MANGT 596 | Business, Government, and Society 3 |

MANGT 695 Business Strategy 3
 MKTG 400 Marketing 3
 STAT 351 Business and Economic
 Statistics II 3

Major field 24
 (All courses numbered above 120 except 505 and 506)
 ACCTG 311 Intermediate Accounting I 3
 ACCTG 312 Cost Accounting 3
 ACCTG 321 Intermediate Accounting II 3
 ACCTG 411 Advanced Accounting 3
 ACCTG 412 Public and Government
 Accounting 3
 ACCTG 413 Accounting Information Systems ... 3
 ACCTG 421 Auditing I 3
 ACCTG 422 Taxation I 3

Economics electives (All courses numbered above 120 except 505 and 506) 6

Restricted electives 9
 Humanities, natural sciences, quantitative, or social science courses below qualify for restricted electives.

Humanities—All courses in art,* history, modern languages, music,* philosophy, dance,* theatre;* ARCH 301; English: all literature plus four (230, 231, 233, 234) humanities courses.

*All courses from these areas are acceptable; however, one may take a maximum of 3 credit hours total from these four areas in participation or artistic skill development courses.

Natural science—All courses in biochemistry, biology, chemistry, geology, and physics; ANTH 280, 281; DEN 420, 425; GEOG 220, 221. One laboratory course is required.

Quantitative electives are: all courses in the computing and information sciences department numbered 300 or above; MATH 221, Analytic Geometry and Calculus II; MATH 222, Analytic Geometry and Calculus III; and all courses in the statistics department numbered 500 or above.

Social science—All courses in anthropology, history, political science, psychology, sociology, and economics, except those used as BAPP requirements or economics electives; all courses in geography, except those listed as natural sciences.

Unrestricted electives 2
 126

Courses in accounting

Undergraduate credit

ACCTG 211. Financial Accounting. (3) I, II, S. The preparation and use of accounting records for individual, partnership, and corporate business organizations. Pr.: Sophomore standing. ACCTG-211-0-0502

ACCTG 221. Managerial Accounting. (3) I, II, S. Development and use of accounting information for management control. Covers statement analysis, cash and funds flows, cost systems and controls, and budgeting. Pr.: ACCTG 211 and MATH 100. ACCTG-221-0-0502

ACCTG 311. Intermediate Accounting I. (3) I, II, S. An in-depth exposure to the environment of accounting and application of accounting theory to the valuation of balance sheet accounts with emphasis on current assets. Pr.: ACCTG 221 and junior standing. ACCTG-311-0-0502

ACCTG 312. Cost Accounting. (3) I, II, S. Allocation of production costs to determine unit costs of goods manufactured and sold and the use of such data by management. Pr.: ACCTG 221. ACCTG-312-0-0502

ACCTG 321. Intermediate Accounting II. (3) I, II, S. A continuation of Intermediate Accounting I with emphasis on non-current and equity accounts. Pr.: ACCTG 311. ACCTG-321-0-0502

ACCTG 411. Advanced Accounting. (3) I, II. Accounting for leases, pensions, consolidations, and liquidation of partnerships. Pr.: ACCTG 321. ACCTG-411-0-0502

ACCTG 412. Public and Governmental Accounting. (3) I, II. Accounting for governmental units and not-for-profit organizations. Current problems in public reporting. Pr.: ACCTG 321. ACCTG-412-0-0502

ACCTG 413. Accounting Information Systems. (3) I, II, S. Specific exposure to information systems and concepts as they relate to accounting through study of transaction cycles, internal controls, decision support systems, knowledge-based systems, and expert systems. Accounting system analysis, design, and implementation are introduced. Pr.: ACCTG 311, 312, and MANGT 466. ACCTG-413-0-0502

ACCTG 421. Auditing I. (3) I, II. An introduction to the environment of auditing and the objectives and techniques of both financial and operational auditing. Pr.: ACCTG 413 or conc. enrollment. ACCTG-421-0-0502

ACCTG 422. Taxation I. (3) I, II, S. Fundamental concepts of income determination in federal and state income tax regulations; examination of the impact of tax regulations on business and personal financial planning and decision making. Pr.: ACCTG 221 and junior standing. ACCTG-422-0-0502

ACCTG 431. Problems in Accounting. (Var.) I, II, S. Pr.: Background of courses needed for the problems undertaken and consent of instructor. ACCTG-431-2-0502

ACCTG 491. C.P.A. Theory and Law. (3) II. Study of theory of accounts and law through a review of current literature and recent C.P.A. examinations. Pr.: MANGT 392, ACCTG 321, and 312. ACCTG-491-0-0502

ACCTG 492. C.P.A Problems. (3) II. A study of problems in various C.P.A. examinations. Pr.: ACCTG 321 and 312. ACCTG-492-0-0502

Undergraduate and graduate credit

ACCTG 631. Accounting Internship. (3) I, II. Provides a full semester of practical accounting experience prior to entering graduate accounting program. Pr.: Twenty-four hours of accounting and admission to M.Acc. program. ACCTG-631-2-0502

ACCTG 710. Accounting Concepts and Analysis. (3) II. The accumulation, presentation, interpretation, and quantitative applications of accounting data for business use. Pr.: MATH 100 and ECON 120 may be taken concurrently. ACCTG-710-0-0502

ACCTG 711. Taxation II. (3) I. A study of the federal and state taxation of partnership and corporate income, estates and trusts, gift taxes, and inheritance taxes. Introduction to tax and estate planning. Pr.: ACCTG 422. ACCTG-711-0-0502

ACCTG 722. Advanced Auditing. (3) I. An in-depth exposure to authoritative auditing pronouncements and specialized topics, e.g., statistical methods, EDP auditing, internal auditing, operational auditing, and audit management. Pr.: ACCTG 421 and 18 hours of accounting. ACCTG-722-0-0502

Graduate credit (graduate students only)

ACCTG 811. Accounting Theory I. (3) I. An intensive treatment of problems in corporation accounting and reporting, with emphasis on income determination and balance sheet valuation. Pr.: Twenty-one hours of accounting. ACCTG-811-0-0502

ACCTG 812. Accounting Controls for Business. (3) I, S. The reliability of accounting data for business decisions and the relevance of such data to particular decisions are evaluated within the framework of changing economic conditions. Pr.: ECON 120 and ACCTG 221. ACCTG-812-0-0502

ACCTG 813. Accounting Research. (3) I. Introduction to accounting research methods and current research in financial, managerial, and public sector accounting, and auditing. Pr.: Twenty-one hours of accounting. ACCTG-813-0-0502

ACCTG 823. Tax Planning and Research. (3) II. Intensive examination of specific problems in taxation of partnership and corporate income, gift taxes, and death taxes. Emphasis on research and tax planning. Pr.: Twenty-one hours of accounting including ACCTG 711. ACCTG-823-0-0502

ACCTG 824. Accounting Theory II. (3) II. A critical examination of accounting literature, with emphasis upon accounting theory and intensive study of current issues in accounting theory. Pr.: Twenty-one hours of accounting. ACCTG-824-0-0502

ACCTG 825. Contemporary Accounting. (3) II. An in-depth exposure to the current literature and pronouncements of accounting, particularly as they impact accounting and reporting practice. Pr.: Twenty-one hours of accounting. ACCTG-825-0-0502

Finance

Ali M. Fatemi,* Head

Professors Cacy,* Hollinger* and Richards;* Associate Professors Fatemi* and Lai; Assistant Professors Dukas and Ekman; Instructor Tavakkol.

The curriculum in finance allows for areas of emphasis in commercial banking, investments, investment banking, and financial management of corporate and noncorporate business firms as well as offering courses in real estate and insurance. The finance major should have a broad understanding of business management concepts accompanied by a sound background in accounting, economic theory, management information systems, and quantitative techniques. The nature of their work also requires that financial managers possess effective communication skills and an ability to work effectively with other internal and external participants in the management, financing, and regulation of business enterprises.

Financial managers specialize in controlling the resource investments required to support an enterprise's operating activities, planning and negotiating appropriate financing arrangements to support these investment requirements, and managing the risks inherent in an enterprise's investment and financing activities.

Requirements for major in finance

BAPP program 60
 (See the general section of the College of Business Administration.)

Accounting courses 6
 ACCTG 311 Intermediate Accounting I 3

One course selected from the following accounting courses in consultation with the student's academic advisor:

ACCTG 312 Cost Accounting 3
 ACCTG 321 Intermediate Accounting II 3
 ACCTG 411 Advanced Accounting 3
 ACCTG 421 Auditing I 3

Business core 25
 FINAN 450 Business Finance 3
 MANGT 420 Management Concepts 3
 MANGT 421 Production/Operations
 Management 3
 MANGT 466 Management Information
 Systems 4

| | | |
|--------------------------|--|-----------|
| MANGT 596 | Business, Government, and Society | 3 |
| MANGT 695 | Business Strategy | 3 |
| MKTG 400 | Marketing | 3 |
| STAT 351 | Business and Economics Statistics II | 3 |
| Major field | | 20 |
| FINAN 550 | Financial Institutions and Markets | 3 |
| FINAN 551 | Introduction to Investments | 3 |
| FINAN 650 | Capital Budgeting | 4 |
| FINAN 651 | Financial Management | 4 |

Six credit hours selected from the following. At least 3 credits must be selected from courses numbered 500 or above:

| | | |
|-----------|--|---|
| ACCTG 422 | Taxation I | 3 |
| FINAN 455 | Professional Financial Planning | 3 |
| FINAN 460 | Insurance | 3 |
| FINAN 552 | Real Estate | 3 |
| FINAN 554 | International Financial Management | 3 |
| FINAN 652 | Working Capital Management | 3 |
| FINAN 653 | Securities and Portfolio Analysis | 3 |
| FINAN 654 | Speculative Markets | 3 |
| FINAN 655 | Commercial Bank Management | 3 |

Economics electives 6
All courses numbered 510 or above in consultation with the student's academic advisor. One course must be selected from either ECON 510, Intermediate Macroeconomics, or ECON 520, Intermediate Microeconomics.

Unrestricted electives **13**
130

Undergraduate credit

FINAN 450. Business Finance. (3) I, II, S. Study of the financial performance characteristics for a business firm accompanied by analysis of the timing, risk, and return attributes of the firm's underlying investment and financing policies. Pr.: ECON 120, STAT 350, CIS 110 or 200 and lab, and ACCTG 221. FINAN-450-0-0504

FINAN 455. Professional Financial Planning. (3) I, II. A study of the principles and practices of professional financial planning in the financial services industry. Topics include programs relating to savings, insurance, investment, real estate, employee benefits, and retirement and income tax management and estate planning. Pr.: ECON 110, 120, and junior standing. FINAN-455-0-0504

FINAN 460. Insurance. (3) I, II. A study of life, property, casualty, and health insurance from the purchaser's point of view with additional emphasis on the operation and contribution of the insurance industry. Pr.: ECON 110. FINAN-460-0-0504

FINAN 498. Problems in Finance. (Var.) I, II, S. Internship program and selected projects appropriate to the student's program of study. Pr.: Consent of department head based on background courses appropriate to the project selected. FINAN-498-2-0504

Undergraduate and graduate credit in minor field

FINAN 550. Financial Institutions and Markets. (3) I, II. The role of financial intermediaries and markets in facilitating the efficient financing of economic activity. Primary emphasis is on financial management concepts that underlie the operation of commercial banks and nonbank institutions in the financial system. Pr.: FINAN 450. FINAN-550-0-0504

FINAN 551. Introduction to Investments. (3) II, S. A study of investment institutions, and principles and practices from the individual viewpoint. Corporate, civil, foreign, and real estate investment are compared as to risk, return, and intrinsic value. Pr.: FINAN 450. FINAN-551-0-0504

FINAN 552. Real Estate. (3) I, II. Principles and practices including legal, economic, and social implications from the viewpoint of the real estate practitioner, investor, and society. Pr.: Junior standing. FINAN-552-0-0504

FINAN 554. International Financial Management. (3) I. An application of financial management concepts to investment, financing, and managerial control decisions undertaken by the multinational firm within its institutional environment of monetary arrangements, financial intermediary organizations, and balance of payments considerations that affect the international flow of capital. Pr.: FINAN 450. FINAN-554-0-0504

Undergraduate and graduate credit

FINAN 650. Capital Budgeting. (4) I, II. Development of a rational and systematic approach to formulating a firm's strategy for investing in productive facilities within an economy characterized by increasing technological change and uncertainty. Pr.: MATH 205, STAT 350, and FINAN 450. FINAN-650-0-0504

FINAN 651. Financial Management. (4) I, II. Analysis of problems in advanced financial planning and control. Pr.: MATH 205, STAT 350, and FINAN 450. FINAN-651-0-0504

FINAN 652. Working Capital Management. (3) I. Application of the concepts of managerial finance to evaluate a firm's short-term investment and financing decisions. Pr.: FINAN 450. FINAN-652-0-0504

FINAN 653. Securities and Portfolio Analysis. (3) I. A theoretical and empirical study of financial management techniques employed by the professional investor to evaluate the underlying risk-return tradeoff on a particular financial asset investment opportunity and the implications of efficient portfolio management techniques for modifying this risk-return tradeoff experience. Pr.: MATH 220 or 205, STAT 351, and FINAN 450. FINAN-653-0-0504

FINAN 654. Speculative Markets. (3) II. An application of the option pricing theory to the valuation of speculative securities such as financial futures, stock options, index options, and futures option contracts. Pr.: FINAN 551. FINAN-654-0-0504

FINAN 655. Commercial Bank Management. (3) II. An application of financial management concepts to the liquidity management, investment portfolio analysis, capital budgeting, and capital structure decision-making process required by a commercial bank to perform effectively its financial intermediation role within the financial system's institutional, regulatory, and competitive environment. Pr.: FINAN 450. FINAN-655-0-0504

FINAN 710. Managerial Finance. (3) I. An intensive coverage of the fundamentals of financial management applicable to the management of nonfinancial institutions. Pr.: MATH 100 and ECON 120. FINAN-710-0-0504

Graduate credit (graduate students only)

FINAN 810. Financial Market Theory. (3) II. Development and analysis of a conceptual framework for understanding (1) the functions performed by financial markets and their associated institutional arrangements, and (2) the contractual claims in transferring savings among business, household, and governmental participants in the economic system. Pr.: FINAN 551. FINAN-810-0-0504

FINAN 820. Advanced International Financial Management. (3) I. A study of the international dimensions of corporate financial management with an applied orientation. Pr.: FINAN 710. FINAN 820-0-0504

FINAN 850. Advanced Managerial Finance. (3) II. A study of the concepts necessary to analyze economic flexibility and risk of investment proposals, cost of capital, and capital structure within the context of a dynamic financial and economic environment. Pr.: FINAN 710. FINAN-850-0-0504

FINAN 890. Seminar in Finance. (3) On sufficient demand. In-depth study of selected contemporary issues in finance. Pr.: FINAN 710. FINAN-890-0-0504

FINAN 898. Advanced Problems in Finance. (Var.) I, II, S. Independent study of selected advanced topic(s) in finance. Pr.: Consent of department head. FINAN-898-0-0504

General Business

The general business major allows the student, in consultation with the academic advisor, to structure a program that fits individual interests. This major is especially appropriate for students who plan to operate their own businesses and who therefore need extensive background in all areas of business. It is also suitable for those who wish to emphasize certain types of advanced courses, such as those which stress business applications of quantitative techniques or the behavioral sciences.

Requirements for major in general business

BAPP program 60
(See the general section of the College of Business Administration)

| | |
|---|-----------|
| Business core courses | 25 |
| FINAN 450 Business Finance | 3 |
| MANGT 420 Management Concepts | 3 |
| MANGT 421 Production/Operations Management | 3 |
| MANGT 466 Management Information Systems | 4 |
| MANGT 596 Business, Government, and Society | 3 |
| MANGT 695 Business Strategy | 3 |
| MKTG 400 Marketing | 3 |
| STAT 351 Business and Economics Statistics II | 3 |

Major field 18
Eighteen credit hours to be taken from courses offered by the College of Business Administration and distributed as follows:

Twelve of the 18 hours must be selected from among the required courses in finance, management, or marketing majors representing all three majors.

The remaining 6 hours must be selected from business courses listed as either required or elective for those three majors.

| | |
|--|----------|
| Economics electives (all courses numbered above 120 except 505 and 506) | 6 |
| Restricted electives | 9 |

Humanities, natural science, quantitative, or social science courses below qualify for restricted electives above.

Humanities—All courses in art,* history, modern languages, music,* philosophy, dance,* theatre;* ARCH 301; English: all literature plus four (230, 231, 233, 234) humanities courses.

*All courses from these areas are acceptable; however, one may take a maximum of 3 credit hours total from these four areas in participation or artistic skill development courses.

Natural science—All courses in biochemistry, biology, chemistry, geology, and physics; ANTH 280, 281; DEN 420, 425; GEOG 220, 221. One laboratory course is required.

Quantitative—All courses in the computing and information sciences department numbered 300 and above; MATH 221, or 222; all statistics courses numbered 500 and above.

Social science—All courses in anthropology, history, political science, psychology, sociology, and economics, except those used as BAPP requirements; all courses in geography, except those listed as natural sciences; DEN 250, Impact of Engineering Technology on Society; ENVD 510, Places and People; HDFS 110,

Introduction to Human Development; HDFS 350, Family Relationships and Sex Roles.

Unrestricted electives 8
126

Undergraduate credit

GENBA 101. General Topics in Business. (1) S. An introduction to the academic challenges and the occupational opportunities in four business areas: management, marketing, finance, and accounting. (Not available to students currently enrolled in business.) Cr/Ncr only. GENBA-101-0-0501

GENBA 299. Honors Colloquium in Business. (1) I, II. Open to freshmen and sophomores in the honors program for the College of Business Administration. Discussions and lectures on topics of interest to business students. GENBA-299-0-0501

GENBA 391. Administrative Communications. (3) On sufficient demand. Preparation of business communications, reports, and correspondence, and analysis of communication systems within an enterprise structure. Pr.: ENGL 120 and SPCH 106. GENBA-391-0-0501

GENBA 498. Problems in Business Administration. (Var.) I, II, S. In-depth analysis of special problems in general business including study of current literature. Pr.: Senior standing and consent of instructor and the department head. GENBA-498-2-0501

GENBA 499. Honors Seminar. (1) I, II. Open to juniors and seniors in the honors program for the College of Business Administration. Selected seminars, lectures, and convocations on topics of interest to business students. Discussion sessions will follow. GENBA-499-0-0501

Graduate credit (graduate students only)

GENBA 894. Seminar in Business Administration. (3) On sufficient demand. Contemporary issues in business administration, including study of current literature and intensive investigation of various problem areas. Pr.: Fifteen hours of business courses at the 600 level or higher. GENBA-894-0-0501

GENBA 898. Advanced Business Problems. Credit arranged. I, II, S. Intensive investigation of special business problems. Pr.: Twenty-one hours of business courses at the 600 level or higher and sufficient training to complete the desired investigation. GENBA-898-3-0501

GENBA 899. Thesis Research. (Var.) I, II, S. Pr.: Sufficient background to pursue line of research undertaken and consent of instructor. GENBA-899-4-0501

Management

Yar M. Ebadi,* Head

Professors Deihl, Ebadi,* and Paul;* Associate Professor Townsend;* Assistant Professors Elsea, Hagmann, McCahon, Niehoff, Pearson, Riley,* and Yu; Instructors Harold and Rice; Emeriti: Professors Barton-Dobenin and Jones; Associate Professor Thiessen; Assistant Professor Buzenberg.

The undergraduate curriculum in management allows for areas of emphasis in human resource management, management information systems, production and operations management, and general management. In addition to these specific

areas, the Department of Management offers courses to improve potential managers' integrative skills as well as top management skills in corporate strategy and institutional leadership. This background provides individuals with excellent opportunities for rapid advancement in professional management careers in larger organizations.

The department also emphasizes small business management, housing the KSU Small Business Development Center, and the L. L. McAninch Chair of Entrepreneurship.

Secondary major in industrial and labor relations

See the Secondary Majors section of this catalog.

Requirements for major in management

| | |
|--|----|
| BAPP program | 60 |
| Business core | 37 |
| ECON 520 Intermediate Microeconomics | 3 |
| or | |
| ECON 540 Managerial Economics | 3 |
| FINAN 450 Business Finance | 3 |
| MANGT 420 Management Concepts | 3 |
| MANGT 421 Production/Operations Management | 3 |
| MANGT 466 Management Information Systems | 4 |
| MANGT 520 Organizational Behavior | 3 |
| MANGT 521 Quantitative Management | 3 |
| MANGT 531 Personnel and Human Resources Management | 3 |
| MANGT 596 Business, Government, and Society | 3 |
| MANGT 695 Business Strategy | 3 |
| MKTG 400 Marketing | 3 |
| STAT 351 Business and Economics Statistics 11 | 3 |

Major field

Select 12 hours from:

Human resources management

| | |
|--|---|
| MANGT 530 Industrial and Labor Relations | 3 |
| MANGT 620 Organizational Design | 3 |
| MANGT 623 Compensation Management | 3 |
| MANGT 630 Labor Relations Law | 3 |
| MANGT 633 Advanced Personnel Management | 3 |
| MANGT 690 International Management | 3 |
| or | |
| MANGT 390 Business Law I | 3 |

Management information systems

| | |
|--|---|
| MANGT 566 Systems Analysis and Design | 3 |
| MANGT 622 Decision Analysis | 3 |
| MANGT 666 Application of Data Models in Business | 3 |
| MANGT 691 Business Measurements and Forecasting | 3 |
| MANGT 696 Computer Applications in Management | 3 |
| MANGT 690 International Management | 3 |
| or | |
| MANGT 390 Business Law I | 3 |

Production/operations management

| | |
|---|---|
| MANGT 522 Operations Planning and Control | 3 |
| MANGT 622 Decision Analysis | 3 |
| MANGT 625 Materials and Procurement | 3 |
| MANGT 691 Business Measurements and Forecasting | 3 |
| MANGT 696 Computer Applications in Management | 3 |
| MANGT 690 International Management | 3 |
| or | |
| MANGT 530 Industrial and Labor Relations | 3 |

General management

Select 3 credit hours from each major field emphasis above and 3 additional credit hours from any of the three fields of emphasis or from the following list:

| | |
|--|---|
| ACCTG 312 Cost Accounting | 3 |
| ACCTG 422 Taxation 1 | 3 |
| FINAN 550 Financial Institutions and Markets | 3 |
| FINAN 551 Introduction to Investments | 3 |
| FINAN 650 Capital Budgeting | 4 |
| FINAN 651 Financial Management | 4 |
| MANGT 440 Entrepreneurship | 3 |
| MKTG 450 Consumer Behavior | 3 |
| MKTG 640 Marketing Research | 3 |
| MKTG 690 Marketing Management | 3 |

Economics electives

All courses numbered above 120 except 505 and 506.

Restricted electives

Humanities, natural science, quantitative, or social sciences below qualify for restricted electives above.

Humanities electives—All courses in art,* history, modern languages, music,* philosophy, dance,* theatre;* ARCH 301; English: all literature plus four (230, 231, 233, 234) humanities courses.

*All courses from these areas are acceptable; however, one may take a maximum of 3 credit hours total from these four areas in participation or artistic skill development courses.

Natural science electives—All courses in biochemistry, biology, chemistry, geology, and physics; ANTH 280, 281; DEN 420, 425; GEOG 220, 221. One laboratory course is required.

Quantitative electives—All courses in the computing and information sciences department numbered 300 and above; MATH 221 or 222; all statistics courses numbered 500 and above.

Social science electives—All courses in anthropology, history, political science, psychology, sociology, and economics, except those used as BAPP requirements or economics electives; all courses in geography, except those listed as natural sciences; DEN 250, Impact of Engineering Technology on Society; ENVD 510, Places and People.

Unrestricted electives 8
126

Undergraduate credit

MANGT 202. Small Business Operations. (3) Opportunities in business ownership, principles governing the starting of a small enterprise; importance, status, problems, and management of a small business. Pr.: ECON 110. Not open to students in College of Business Administration. MANGT-202-0-0506

MANGT 330. Introductory Seminar. (1) I. A multidisciplinary introduction to the field of industrial and labor relations. Examines the economic, legal, psychological, and sociological aspects of the field. MANGT-330-0-0516

MANGT 390. Business Law I. (3) I, II. A study of law as it relates to business, including court procedures and systems, contracts, torts, agency and employment law, and business crimes. Pr.: Junior standing. MANGT-390-0-0501

MANGT 392. Business Law II. (3) On sufficient demand. A study of civil law as it affects commercial transactions, including corporations, partnerships, property, commercial paper, and secured transactions. Pr.: MANGT 390; MANGT-392-0-0501

MANGT 420. Management Concepts. (3) I, II, S. Managing organizations through fundamental processes of developing plans, structuring work relationships, coordinating effort and activities, directing and motivating subordinates, and controlling. Also includes managerial roles and responsibilities, effective decision making, productivity improvement, and models and theories of human behavior. Pr.: ECON 120, PSYCH 110, SOCIO 211, and junior standing. MANGT-420-0-0506

MANGT 421. Production/Operations Management. (3) I, II, S. Description and analysis of problems related to the output of goods and services, operations planning and control, and systems management. Pr.: MATH 205 and STAT 351. MANGT-421-0-0506

MANGT 440. Entrepreneurship. (3) I, II. The role of the entrepreneur is examined in the conception, start-up, organization, and development of new independent businesses. New venture problems to be studied include identification of possible new products and services, evaluation of practical commercial potential, and development of a business plan, with attention to financing, operating, and marketing. Pr.: FINAN 450, MANGT 420, MKTG 400. Instructor may waive prerequisites based on appropriate business experience. MANGT-440-0-0506

MANGT 466. Management Information Systems. (4) I, II, S. A comprehensive view of the organization's information requirements and the role of computer information systems in gathering and producing information. Concepts of data resource management, assessing developments in information technology, and information systems' impact on organizations. Problems and techniques concerning the development and installation of responsive systems with special attention to managers' use of systems' outputs. Case studies and selected applications. Three hours rec. and two hours lab a week. Pr.: CIS 110 or 200 and lab; MANGT 420. MANGT-466-0-0506

MANGT 495. Business Internship. (3) S. Eight weeks of business experience between junior and senior years designed to coordinate the interests of students and firms. Pr.: FINAN 450, MANGT 420, MKTG 400, completion of junior year, and consent of instructor. MANGT-495-2-0501

MANGT 498. Independent Studies in Management. (Var.) I, II, S. In-depth analysis of special problems in management including study of current literature. Pr.: Senior standing and consent of the instructor and the department head. MANGT-498-2-0506

Undergraduate and graduate credit in minor field

MANGT 520. Organizational Behavior. (3) I, II. Examination of psychological and sociological variables important in understanding individual motivation, group functioning, change, creativity, and leadership in organizations. Pr.: MANGT 420. MANGT-520-0-0506

MANGT 521. Quantitative Management. (3) I, II. Quantitative techniques, models, and the integrative nature of management systems. Includes PERT, CPM, linear programming, and inventory models. Pr.: CIS 110 or 200 and lab, MANGT 420, MATH 205, and STAT 350. MANGT-521-0-0506

MANGT 522. Operations Planning and Control. (3) I. Development of concepts and understanding of planning and control systems for allocating resources and scheduling activities in business firms. To guide and coordinate the flow of materials, labor inputs, and goods and services through physical productive systems. Topics include: aggregate planning, master production scheduling, production activity planning and control, operations information systems, inventory control, material requirements planning, and total quality control. Pr.: MANGT 421. MANGT-522-0-0506

MANGT 530. Industrial and Labor Relations. (3) I. Basic course in industrial and labor relations. Broad coverage of the institution of collective bargaining and its environment, the goals and operation of labor unions, the impact of unions on management, and labor relations law. Pr.: Junior standing. MANGT-530-0-0516

MANGT 531. Personnel and Human Resources Management. (3) I, II. The personnel program and its operational processes of manpower planning, recruiting, testing, developing, and evaluating. Analysis of the personnel department's role in the organization with emphasis on problem solving. Pr.: MANGT 420. MANGT-531-0-0506

MANGT 566. Systems Analysis and Design. (3) I. Development of a basic understanding of the systems approach and an examination of the systems impact on managerial decision making. Evaluation of systems analysis alternatives from a manager's point of view to formalize complex managerial situations effectively. Management issues associated with each stage of the systems development life cycle—especially identification of management information requirements and implementation and maintenance strategies. Relationship of systems design and organization structure. Pr.: MANGT 466 and 520. MANGT-566-0-0506

MANGT 596. Business, Government, and Society. (3) I, II, S. The interrelationships and interactions of business with the social, political, and economic institutions. The impact of changes in the external environment on business and the managerial task. Pr.: FINAN 450, MANGT 420, and MKTG 400. MANGT-596-0-0501

MANGT 620. Organizational Design. (3) On sufficient demand. An in-depth analysis of theories and research in organizational structure and climate. Includes the impact of the strategic environment; organizational size, complexity, volatility, and culture; technology; task design and specialization of labor; and organizational change. Pr.: MANGT 520. MANGT-620-0-0506

MANGT 622. Decision Analysis. (3) I, II. Application of decision-making models and quantitative techniques to business problems and policy. Pr.: MANGT 421. MANGT-622-0-0506

MANGT 623. Compensation Management. (3) I. An in-depth analysis of theories, research, and practices of performance appraisal and compensation systems. Includes study of the impact of economic, behavioral, legal, and political forces on compensation management. Pr.: MANGT 531. MANGT-623-0-0506

MANGT 625. Materials and Procurement Management. (3) II. Principles and concepts of planning and control of materials movement and storage activities in business organizations. Topics include: materials handling, purchasing, order processing, inventory management systems, and the application of materials requirement planning. Pr.: MANGT 421. MANGT-625-0-0506

MANGT 630. Labor Relations Law. (3) II. Detailed examination of the development and current status of labor relations law governing the private sector in interstate commerce. Topics to be discussed include antitrust prosecution of unions, injunctions, unfair labor practices, NCRP policies, employee rights, union rights, employer rights, and contract enforcement. Pr.: Junior standing. MANGT-630-0-0516

MANGT 631. Collective Bargaining. (3) On sufficient demand. Study of the unionized labor market. The goals, strategies, and tactics of unions and management will be examined in detail. Other topics include the environment of collective bargaining, contract negotiations, administration, and enforcement. Pr.: MANGT 530; or ECON 120 and MANGT 630. MANGT-631-0-0516

MANGT 633. Advanced Personnel Management. (3) On sufficient demand. An in-depth analysis of selected topics in personnel management and employment legislation including study of current research and literature. Pr.: MANGT 531. MANGT-633-0-0506

MANGT 637. Industrial Conflict Resolution. (3) On sufficient demand. Examination of causes and nature of conflict in business and between organizations. The resolution of dysfunctional conflict and management of functional conflict. Special emphasis on resolution techniques, including mediation, arbitration, negotiation, and litigation avoidance. Pr.: MANGT 530 and 630. MANGT-637-0-0516

MANGT 639. Advanced Labor Relations. (3) On sufficient demand. Research methods, model building, economics of the unionized labor markets, and the behavioral theory of negotiations will be examined in detail. Pr.: MANGT 631 or ECON 620. MANGT-639-0-0516

MANGT 666. Application of Data Models in Business. (3) I. Examination of interrelationship between managers and database designers from the user's perspective. Database design strategies for the functional areas of business such as accounting, marketing, and manufacturing management with a focus on making data responsive to changing information needs and supportive of organizational plans and goals. Pr.: MANGT 466. MANGT-666-0-0506

MANGT 690. International Management. (3) On sufficient demand. Examination of business decision parameters and strategy in a multinational context. The influence of cultural, economic, political, and social differences on decision making and the operation of American enterprises in the international environment. Pr.: FINAN 450, MANGT 420, MKTG 400. MANGT-690-0-0506

MANGT 691. Business Measurements and Forecasting. (3) On sufficient demand. Performing the measurement and forecasting functions in the organization, selecting and analyzing organizational and economic data, applying appropriate techniques, and integrating results with formal plans and decisions. Applications and forecast preparation. Pr.: CIS 110 or 200 and lab, and MANGT 421. MANGT-691-0-0506

MANGT 695. Business Strategy. (3) I, II, S. An integration of previous courses through the study of problems in policy formulation and implementation. Cases and current topics with emphasis on strategic planning. Open only to seniors or graduate students. Pr.: FINAN 450, MANGT 420, and MKTG 400. MANGT-695-0-0501

MANGT 696. Computer Applications in Management. (3) A study of computer solutions to business problems and the development of computer models and programs in PERT, inventory control, mathematical programming, simulation, operations data analysis, and information systems. Pr.: CIS 110 or 200 and lab, and MANGT 421. MANGT-696-0-0506

MANGT 720. Management of Organizations. (3) I. An intensive coverage of managerial concepts, with emphasis on micro topics such as motivation, perception, individual differences, interpersonal communications, and group processes, and macro topics such as organization design and the external environment. Integration of micro and macro levels of analysis is accomplished by examining organizational processes such as leadership, conflict, power, and organizational change. Pr.: ECON 120 or conc. enrollment. MANGT-720-0-0506

MANGT 721. Production and Operations Management. (3) II. Concepts and quantitative methods are integrated into a conceptual framework of production systems with applications and current issues. Major problems in managing the production, distribution, and information functions of manufacturing and service systems. Capacity determination, resource requirements planning, operating systems designs, scheduling, quality control models and systems, technological change and innovation, quantitative methods, comparisons of production and service processes and systems. Pr.: MANGT 720, MATH 205, and STAT 707 or conc. enrollment. MANGT-721-0-0506

MANGT 766. Introduction to Management Information Systems. (3) II. Identifying and developing the sources of raw materials of MIS building blocks. Covering such topics as data organization; decisions support models and issues; systems reliability and maintenance; capturing and developing information from management science models; and structuring information in terms of managerial decision making and organizational functions, including a comprehensive case. Two hours lec. and three hours lab a week. Pr.: CIS 110 and MANGT 720. MANGT-766-0-0506

MANGT 791. Legal and Social Environment of Business. (3) I. A study of the legal and social foundations of contemporary business; an analysis of public policies toward business; and case discussions of problems in the interaction of business firms with other elements of society. Pr.: Open to graduate students in

business administration and accounting and to other graduate students with consent of instructor. MANGT-791-0-0501

Graduate credit (graduate students only)

MANGT 820. Behavioral Management Theory. (3) II, S. An in-depth analysis of the development of the behavioral bases of individual and group behavior in business, governmental, educational, and other organizations with emphasis on current research literature and applications. Pr.: MANGT 720. MANGT-820-0-0506

MANGT 840. Advanced Entrepreneurship. (3) I, II. An in-depth examination of the nature of entrepreneurship including success factors, the requirements of successful new venture planning and implementation, and researching the current literature in the field. The study of new product identification, the assessment of commercial potential, and the elements of an effective business plan will be examined in detail, culminating in the preparation of a comprehensive plan for the development and marketing of a new product or service. Pr.: FINAN 710, MANGT 720, and MKTG 700. MANGT-840-0-0506

MANGT 866. Advanced Management Information Systems. (3) I, S. An in-depth, analytical treatment of organizing, producing, and using information in complex organizations. Examination of information-management tools and concepts including technological developments, data processing, information systems' impact on organizations, and system output implementation. Problems and techniques concerning the development and installation of responsive systems' outputs. Pr.: MANGT 766. MANGT-866-0-0506

MANGT 888. Administrative Strategy. (3) I, S. Through case analysis, a study of the functions, responsibilities, and point of view of general management and the problems which affect the total organization's character and success. The formulation and application of administrative strategy; specifically, analysis of interrelationships between the external and internal environments, choice of purpose, molding of organizational character, definition of what needs to be done, and mobilization of resources for goal attainment. Pr.: FINAN 850, MANGT 820 and 893, and MKTG 840. MANGT-888-0-0506

MANGT 890. Decision Theory. (3) On sufficient demand. An integration of economic theory and operations research in solving business problems and making decisions with emphasis on model building, information selection and use, reducing uncertainty, and strategy development and optimization. Pr.: MANGT 720, MATH 205, STAT 707 or conc. enrollment. MANGT-890-0-0506

MANGT 893. Business Operations Analysis. (3) II, S. The application of management science methods to business problems to provide a basis for rational decision making. Includes mathematical programming, inventory theory, simulation, model building, and heuristics. Pr.: MANGT 720, MATH 205, STAT 707 or conc. enrollment. MANGT-893-0-0506

MANGT 897. Topics in Management. (3) On sufficient demand. Discussion and analysis of a special topic, including applications, developments, and study of relevant literature and research findings. Pr.: MANGT 720, 721, and 766 or equivalent. MANGT-897-0-0506

MANGT 898. Special Problems in Management. (Var.) As scheduled. An in-depth study of specified topics. Pr.: Twelve hours of management and consent of the instructor and department head. MANGT-898-0-0506

Marketing

Wayne Norvell,* Head

Professors Coleman* and Norvell,* Associate Professors Andrus, Fraser, and Hite; Instructors Ahern and Thierer.

Study in marketing covers such areas as the consumer, the seller, marketing strategy, marketing research, and marketing decisions. The Department of Marketing offers an undergraduate degree program as well as graduate work in the master of business administration (M.B.A.) degree. Undergraduate dual degree and dual major programs, combining marketing with other fields, may be arranged by consulting the marketing department office. Extracurricular activities are available through the Marketing Club (for all students), Pi Sigma Epsilon (sales management), and Alpha Mu Alpha (national honorary). Each offers continuing social and professional functions involving practicing marketers.

Requirements for major in marketing BAPP program 60

| | |
|--|-----------|
| Business core courses | 25 |
| FINAN 450 Business Finance | 3 |
| MANGT 420 Management Concepts | 3 |
| MANGT 421 Production/Operations Management | 3 |
| MANGT 466 Management Information Systems | 4 |
| MANGT 596 Business, Government, and Society | 3 |
| MANGT 695 Business Strategy | 3 |
| MKTG 400 Marketing | 3 |
| STAT 351 Business and Economic Statistics II | 3 |
| Major field | 18 |
| MKTG 450 Consumer Behavior | 3 |
| MKTG 640 Marketing Research | 3 |
| MKTG 690 Marketing Management | 3 |

Plus nine hours from:

| | |
|--|---|
| MKTG 541 Retailing | 3 |
| MKTG 542 Sales Management | 3 |
| MKTG 543 Promotional Strategy | 3 |
| MKTG 544 International Marketing | 3 |
| MKTG 545 Marketing Channels | 3 |
| MKTG 550 Industrial Marketing | 3 |

Economics electives 6

One must be selected from the following four courses:

| |
|--------------------------------------|
| ECON 510 Intermediate Macroeconomics |
| ECON 520 Intermediate Microeconomics |
| ECON 530 Money and Banking |
| ECON 540 Managerial Economics |

The second elective may be selected from the first four or from the following:

| |
|---------------------------------------|
| ECON 555 Urban and Regional Economics |
| ECON 631 Principles of Transportation |
| ECON 633 Public Finance |
| ECON 681 International Trade |

Restricted electives 9

Humanities, natural, quantitative, or social sciences below qualify for restricted electives.

Humanities—All courses in art,* history, modern languages, music,* philosophy, dance,* theatre;* ARCH 301; English: all literature plus four (230, 231, 233, 234) humanities courses.

*All courses from these areas are acceptable; however, one may take a maximum of 3 credit hours total from these four areas in participation or artistic skill development courses.

Natural science—All courses in biochemistry, biology, chemistry, geology, and physics; ANTH 280, 281; DEN 420, 425; GEOG 220,221. One laboratory course is required.

Quantitative—All courses in the computing and information sciences department numbered 300 and above; MATH 221 or 222; all statistics courses numbered 500 and above.

Social science—All courses in anthropology, political science, psychology, sociology, and economics, except those used as BAPP requirements or economics electives; all courses in geography, except those listed as natural sciences; DEN 250, Impact of Engineering Technology on Society; ENVD 510, Places and People; HDFS 110, Introduction to Human Development; HDFS 350, Family Relationships and Sex Roles.

Unrestricted electives 8
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Undergraduate credit

MKTG 400. Marketing. (3) I, II, S. A general study of marketing principles which lead to the development of marketing strategy. A review of environmental influences and key analytical tools used in formulating marketing plans. Product or service design, distribution, pricing, and promotional programs. Pr.: ECON 110 and 120. MKTG-400-0-0509

MKTG 442. Sales Communication. (3) I, S. Focuses on the nature of interpersonal communications, both oral and written, between buyers and sellers. The mechanics and intricacies of personal sales presentations. Concepts of buyer behavior and communication theory. Students develop selling communications skills through practice. MKTG-442-0-0509

MKTG 450. Consumer Behavior. (3) I, II, S. An examination of consumer motives, attitudes, and decision processes as these relate to product imagery and purchase symbolism. The sociological and psychological foundations of marketplace choice are analyzed, including life-style, social status, age, income, taste, habit, custom, fashion, self-concept, and opinion influences. Pr.: MKTG 400 and junior standing. MKTG-450-0-0509

MKTG 498. Independent Study in Marketing. (Var.) I, II, S. Selected topics in marketing. Pr.: Consent of department head. MKTG-498-2-0509

Undergraduate and graduate credit in minor field

MKTG 541.-Retailing. (3) I. An introduction to retailing from the management point of view; study of retail policies and organization; the operation of the buying and selling functions, merchandise control, store systems, personnel management, retail accounting, and expense control. Pr.: MKTG 400. MKTG-541-0-0509

MKTG 542. Sales Management. (3) II, S. Management of the sales force in other than retail settings. Involves hiring, screening, recruiting, training, organizing, motivating, supervising, controlling, and evaluating members of the sales force. Also focuses on the development and execution of sales strategies as well as on the mechanics and need for sales forecasting. Pr.: MKTG 400. MKTG-542-0-0509

MKTG 543. Promotional Strategy. (3) I. Focuses on the management of promotional programs which include elements of advertising, personal selling, sales promotion, and public relations. Includes a review of concepts from economics, behavioral sciences, and mathematics which play a role in creating, executing, and evaluating promotional programs. Pr.: MKTG 400 and 450. MKTG-543-0-0509

MKTG 544. International Marketing. (3) II. This course deals with the management of marketing problems arising from various degrees of foreign involvement (exports, licensing, foreign subsidiaries). Emphasis is on the management of marketing functions in a multinational context where the parameters differ from those in domestic marketing. Topics include international economic factors, foreign cultures, nationalism and government influences, and economic development. Pr.: MTKG 400. MKTG-544-0-0509

MKTG 545. Marketing Channels. (3) II, S. Study of the quantitative and qualitative factors involved in selecting, developing, managing, and controlling marketing channels of distribution. Includes decision models from industrial marketers through purchasing units. Pr.: MKTG 400. MKTG-545-0-0509

MKTG 550. Industrial Marketing. (3) I. A study of the nature of the industrial marketplace, concentrating on those aspects that differentiate it from the consumer markets. The major topics are analysis of market needs, market segments, organizational buying behavior, purchasing agent functions and activities, marketing strategy and mix for institutional customers, not-for-profit and services marketing, and buyer/seller relations. Pr.: MKTG 400. MKTG-550-0-0509

Undergraduate and graduate credit

MKTG 640. Marketing Research. (3) I, II, S. Designed to acquaint the students with various marketing research concepts, methods, and techniques; and to develop their ability to evaluate, use, and present research findings. Pr.: STAT 351, CMPSC 200 and lab, and MKTG 400. MKTG-640-0-0509

MKTG 690. Marketing Management. (3) I, II, S. Analysis of marketing situations which lead to appropriate management of the marketing program's objectives. Capstone course integrates knowledge of marketing and other business management principles into marketing strategy, development, implementation, and control. Pr.: MKTG 640 and 450. MKTG-690-0-0509

MKTG 700. Marketing Theory and Practice. (3) I. A comprehensive study of marketing concepts and analytical tools used in developing marketing strategy. Pr.: ECON 110 and 120. ECON 120 may be taken conc. MKTG-700-0-0509

Graduate credit (graduate students only)

MKTG 840. Advanced Marketing Management. (3) II. An analytical approach to the study of marketing problems of business firms and other types of organizations. Attention to the influence of the marketplace and the marketing environment on marketing decision making; the organization's services, products, and communication strategies; and the organization's systems for planning and controlling its marketing effort. Pr.: Six hours of economics, 3 hours in marketing, 3 hours in statistics, and MATH 205 or 220. MKTG-840-0-0509

MKTG 841. Special Topics in Marketing. (3) On sufficient demand. Investigation and discussion of a selected advanced topic in marketing. One of the following five topics will be chosen for intensive study: (1) industrial marketing management, (2) advanced consumer behavior, (3) product policy, (4) financial aspects of marketing management, (5) marketing in the service sector. Pr.: MKTG 840 or 6 hours of marketing. MKTG-841-0-0509

MKTG 892. Research Methods in Business. (3) I. Application of statistical methods of analysis to problems in business. Experimental design, data collection, and methods of analysis are covered. Pr.: STAT 350 and MANGT 420. MKTG-892-0-0509

MKTG 898. Independent Study. (Var.) I, II, S. Selected topics in marketing. Pr.: Consent of department head. MKTG-898-0-0509

Agribusiness option in marketing
Marketing majors interested in agriculture may take an option in agribusiness. Students choosing the agribusiness option complete all requirements for the marketing major plus hours in agribusiness.

Requirements for agribusiness option in marketing

BAPP program 62
Complete the BAPP program with one exception: natural science electives—9 credit hours; BIOL 198, Principles of Biology (4 hours) and CHM 110, General Chemistry (5 hours)

Business core courses 43
FINAN 450 Business Finance 3
MANGT 420 Management Concepts 3
MANGT 421 Production/Operations Management 3
MANGT 466 Management Information Systems . 4
MANGT 596 Business, Government, and Society 3
MANGT 695 Business Strategy 3
MKTG 400 Marketing 3
MKTG 450 Consumer Behavior 3
MKTG 640 Marketing Research 3
MKTG 690 Marketing Management 3
STAT 351 Business and Economics Statistics II 3

AGEC 500 Production Economics 3
AGEC 505 Agricultural Market Structure 3
AGEC 518 Economic Principles of Agricultural Business Firms 3

Economics electives 3
Select one course from the following:
ECON 510 Intermediate Macroeconomics 3
ECON 530 Money and Banking 3
ECON 555 Urban and Regional Economics 3
ECON 631 Principles of Transportation 3
ECON 633 Public Finance 3
ECON 681 International Trade 3

Nineteen hours must be taken from the following three groups of electives:

Agribusiness electives 9
AGEC 510 Agricultural Policy 3
AGEC 512 Farm Management 3
AGEC 513 Agricultural Finance 3
AGEC 515 Marketing of Agricultural and Food Products 3

AGEC 516 Agricultural Law and Economics ... 3
AGEC 517 Rural Banking 3

Only one from the following may be selected toward the 9 hours:

AGEC 520 Grain Marketing 3
or
AGEC 521 Livestock-Meat Marketing 3
AGEC 522 Commodity Futures Marketing 3
AGEC 523 Export Marketing 3
AGEC 525 Natural Resource Economics 3
AGEC 605 Price Analysis 3
AGEC 610 Agricultural and Natural Resources Policy 3
AGEC 615 International Agricultural Development 3

Agricultural sciences and/or product technology

electives 6-8

AGRON 220 Crop Science 4
or
HORT 200 Plant Science 4
AGRON 305 Soils 4
AGRON 340 Market Grading of Cereals 2
AGRON 501 Range Management 3
ASI 102 Principles of Animal Science 3
and
ASI 103 Dairy Science Lab 1
or
ASI 104 Poultry Science Lab 1
or
ASI 105 Animal Science and Industry Lab .. 1
ASI 300 Principles of Livestock Feeding 3
ASI 302 Introduction to Food Science 3
ASI 305 Fundamentals of Food Processing .. 3
ASI 350 Principles of Meat Science 3
ASI 361 Meat Processing 2
ASI 405 Fundamentals of Milk Processing .. 3
ASI 430 Food Products Evaluation 3
ASI 694 Food Plant Management 3
ENTOM 300 Economic Entomology 3
ENTOM 305 Livestock Entomology 3
FN 132 Basic Nutrition 3
FN 301 Trends in Food Products 3
FOR 285 Introduction to Forestry 3
GENAG 500 Food Science Seminar 3
GRSC 108 Principles of Milling 3
GRSC 305 Fundamentals of Food Processing .. 3
GRSC 120 Introductory Bakery Technology ... 2
and
GRSC 121 Introductory Bakery Technology Lab 1
PLPTH 500 Principles of Plant Pathology 3

Additional agribusiness option electives

..... 2-4
Select additional courses from agribusiness electives and agricultural sciences and/or product technology electives to total 19 credit hours.

Education

David R. Byrne, Dean

Michael C. Holen, Associate Dean

Jerry G. Horn, Associate Dean

Michael F. Perl, Director, Center for

Student and Professional Services and

Coordinator of Laboratory Experiences

Willard J. Nelson, Associate Director,

Center for Student and Professional Services

Candace Bond, Certification Officer and

Associate Director, Center for Student and Professional Services

6 Bluemont Hall

532-5525

College of Education programs prepare individuals for the broad spectrum of educational positions.

Primary consideration is given to preparing education students for the various positions in elementary, secondary, occupational, and vocational programs, and the personnel who support these programs. In addition, the college provides consultative services and in-service training for the improvement of various aspects of education programs at all levels.

The College of Education cooperates with all other colleges and departments at KSU in its interdisciplinary approach to the preparation of teachers and other educational personnel.

The KSU undergraduate teacher education programs and the master of science, doctor of philosophy, and doctor of education degree programs are accredited by the Kansas Board of Education, North Central Association of Colleges and Secondary Schools, and the National Council for Accreditation of Teacher Education.

The College of Education participates in the intercollegiate programs in women's studies and gerontology, described earlier in the Secondary Majors section of this catalog.

Support Facilities and Programs

In addition to major instructional and research programs, the College of Education provides service to KSU faculty and students, local schools, and a wide variety of other entities in the state and region. Specific services of the College of Education are provided/coordinated through the following centers.

Center for Extended Services and Studies

The center initiates and responds to requests for staff development programs, administrative searches, curriculum studies, staff development needs assessments, program evaluations, and other studies designed to generally enhance the improvement of education at all levels and environments.

The center is staffed and maintained through the assignment of faculty and staff in the College of Education and through contracts with faculty from KSU and other professionals as determined by the nature of the project. Coordination of resources at KSU for educational development is a major responsibility of this service unit.

Center for Rural Education and Small Schools

Activities designed to address the unique educational needs of small schools and rural communities in Kansas and the plains states are the major focus of this center. Its basic services as ongoing endeavors are in research—to identify unique needs, effective techniques, and decision-making processes—and assistance programs centered on the development, coordination, and delivery of information and services. Development and maintenance of linkages with local schools and state and federal agencies are important functions of the center. A highly successful annual conference on rural education and small schools has attracted national attention and was initiated by the center and faculty and staff in the College of Education.

Center for Economic Education

With joint support from KSU and many Kansas businesses, the Center for Economic Education has developed and conducted pre- and in-service programs on economic education, including consumer economic awareness. Center staff provide consultation seminars, non-credit workshops, and graduate credit course work for schools and educators interested in improving the competence of their students in economic education. A mini-grant program for teachers, the nationally acclaimed Stock Market Game, and an extensive materials library (free loan basis) are important functions of the center.

From its inception, the center has recognized the importance of the classroom teacher. Most of its programs and activities are designed to help improve the quality and increase the quantity of economics taught to students, from the elementary level to adult levels.

Midwest Regional Processing Center for the Stock Market Game

The College of Education and University Computing Activities work with the Securities Industry Foundation for Economic Education in processing portfolios for states participating in the Stock Market Game. In addition, curriculum materials and a consultation service are provided to state coordinators to enhance the teaching of economic concepts and to assist in interpreting weekly stock portfolios.

Instructional Media Center

The Instructional Media Center provides a wide range of services, instructional materials, and audiovisual equipment for faculty and students. Professional-quality materials such as tapes, overhead transparencies, slides, films, and displays are produced for faculty members. Students use the media center to prepare similar materials for use in class projects and in student teaching. Audiovisual equipment of many types is maintained and provided by the center. The instructional materials collection includes films, filmstrips, slides, and tapes used in teacher education.

A video recording studio is used in the production of instructional television recordings. The Instructional Media Center also includes an outstanding audio recording studio. These studios accommodate production and reproduction of a variety of recorded teaching and individual study materials.

Facilities are available for group and individual uses of instructional media, including rooms for group viewing of films and video tapes, and an independent development laboratory for the individual use of instructional materials. The laboratory includes learning spaces with all materials and equipment needed for totally individualized instruction.

Center for Science Education

Administratively housed in the College of Education, the Center for Science Education is a university-wide vehicle for marshaling and coordinating K-State's historically independent and compartmentalized endeavors in science, mathematics, technology, and environmental education. Groups of faculty affiliates specializing in science, mathematics, computer science, educational technology, and environmental education from across the K-State campus are brought together to address teaching and learning issues.

The center's mission is to improve the quality of science, mathematics, and technology teaching and learning throughout Kansas and the prairie states from kindergarten through the Ph.D. level. The center facilitates collaboration among individuals and units on and off campus for the purpose of conducting research; developing curriculum materials, pedagogical strategies, and organizational mechanisms; demonstrating their effectiveness in model school sites; and disseminating the latest knowledge to an audience of school administrators, teachers, researchers, and other professionals in related organizations and non-formal educational settings.

Honors program

The honors program in the College of Education, also described in the Honors Programs section of this catalog, has been established for undergraduate students who have demonstrated high academic achievement. The major purpose of the honors program is to give selected students an opportunity to expand their knowledge of the teaching profession and to acquire a desire to be leaders in the profession. The program is designed for students in the College of Education and other students who are completing a teacher certification program through another college at Kansas State University.

Participants may expect to receive recognition of academic ability and achievements; learn and interact with other honor students in small groups; establish close association with faculty members in seminars and research projects; exercise creativity and explore leadership responsibilities; and have alternatives to selected required courses in the professional education component.

Admission requirements

1. Present a written statement of interest in the program.
2. Submit an ACT Composite score of 28 or higher or evidence of a cumulative grade point average of 3.5 in a minimum of 9 semester hours of college work.
3. Enroll in the non-credit course DED 010, Introduction to the Honors Program.
4. Have a satisfactory interview with a faculty member of the Honors Program Coordinating Committee.

Student progression after admission

1. Formal admission to the honors program by the Coordinating Committee.
2. Enrollment each semester in DED 020, Honors Program (0).
3. Enrollment in a special section of EDAF 315, Educational Psychology (3), designated for honors students.

4. Enrollment in a minimum of two Honors Seminars (DED 320) prior to graduating.
5. Maintenance of a grade point average of 3.5 or better in all college work.
6. Completion of DED 420, Honors Research (1-3), for at least 2 credit hours under the supervision of a professor in the College of Education.

Features of the program

Honors seminars are offered each semester. Students will be encouraged to enroll in one seminar each semester although the minimum requirement for the program is two honors seminars. One of the required seminars may be taken in another college of KSU. The seminars will focus on topics which will broaden the knowledge of future teachers and give them insights into leadership responsibilities in their professions.

Honors Research gives students an opportunity to work with professors having similar research interests. Research topics may be selected from a range of areas and they may reflect the student's particular interests.

Teacher Education

Undergraduate study

The College of Education is the designated authority for all KSU teacher certification recommendations to the Kansas Department of Education. All certification programs offered by KSU have been approved by the Kansas Department of Education. The programs are designed to develop competencies essential for teaching. Some programs are parts of degree requirements in colleges other than the College of Education. All College of Education program requirements are subject to revision as necessary to meet Kansas certification standards. Students should contact their advisors or the director of certification if they have questions about certification program changes.

Certification through the teacher education program is available for three teaching levels: early childhood education prepares for preschool teaching, birth to K; elementary education prepares for grades K-9; and secondary programs satisfy state certification requirements for grades 7-12.

Requirements for admission

The application for admission to a teacher education program must be filed when the applicant has satisfied all of the admission requirements. Transfer students who have satisfied all the admission requirements should apply at the time of initial enrollment.

Students making changes in degree programs must reapply for teacher education.

Hours

Fifty total hours must be completed including all transfer and KSU credits.

English composition

Both English Composition I and II must be completed satisfactorily with the average of both of these grades being at least a C. Students may take an English exam if a grade average of C is not achieved.

Public speaking

A C grade or better is required in SPCH 105, 106, or 109. Students may complete the requirement with the quiz-out conducted by the speech department. Courses in interpersonal communication may not apply.

Overall GPA

Full admission

2.5 is required in all college work attempted, including transfer and KSU credits.

Probationary admission

An applicant with a cumulative grade point average of 2.4 or above may apply for admission on a probationary status, provided all other requirements have been met. Those admitted on a probationary basis must achieve a cumulative grade point average of 2.5 by the time they have completed the first 30 hours after admission to teacher education, or they will be dropped from the teacher education program.

Secondary education teaching specialty

A 2.5 GPA is required in all college work attempted in the teaching specialty at other institutions and at KSU. There is no probationary admission for students with a teaching field GPA of less than 2.5.

Pre-professional skills tests

A transfer student may be admitted provisionally before the test is taken, but the student must take the test the next time it is given on campus or the student will be dropped from teacher education. Tests will be given throughout the year on dates specified by the testing service and will include sections on reading, writing, and mathematics. A score of 172 on each section, reading, writing, and math, is required for admission to teacher education.

Pre-professional laboratory experience

Completion of an early field experience is required for admission to teacher education. This requirement may be met for elementary majors with DED 100 and secondary majors with DED 102. Students enrolled in home economics education, vocational agriculture, early childhood education, or speech clinician programs should contact their advisors concerning

the proper course to satisfy this requirement. Students may be provisionally admitted to teacher education if they are enrolled in an early field experience at the time of application. If the field experience is not completed with a passing grade, the student will be dropped from teacher education.

Application deadlines

Requirements met by end of summer semester October 1
Requirements met by end of fall semester February 15
Requirements met by end of spring semester June 15

When the applications are approved, students are notified of their acceptance into the respective teacher education professional program and are reassigned from a pre-professional advisor to a professional-level advisor. Students who do not meet the requirements will be notified of the options available to them.

Professional semester

The professional semester comprises a series of prescribed courses which allocate one-half or more of the semester to teaching participation (student teaching). This semester usually occurs in the fall or spring of the senior year. There is no teaching participation experience offered during summer sessions.

Students desiring to be recommended for certification by KSU must earn credit for teaching participation in residence. Those students who have had any secondary methods course at another college or university will be required to audit the equivalent course at KSU.

Students may only take the courses prescribed for the professional semester unless permission is obtained through the Office of the Coordinator of Laboratory Experiences. Teaching participation is graded Credit/No Credit.

Application for student teaching

The application for student teaching must be submitted to the College of Education coordinator of laboratory experiences not later than December 20 of the year preceding the professional semester. Students must submit the application by this deadline even though all admission requirements to the professional semester are not fully satisfied.

The application will be obtained from and returned to the coordinator of laboratory experiences. Junior and senior transfer students from other educational institutions should file the application immediately upon enrollment.

Admission to the professional semester

Students will be approved for the professional semester when the requirements listed below have been met. If the student is

notified that all requirements for the professional semester have not been satisfied, the student may request through the College of Education advisor that the application be postponed for one semester. Only one postponement is permitted without filing a new application for student teaching.

Requirements for all applicants to the professional semester

Full admittance to a teacher education program.

Completion of 90 semester hours.

An overall grade point average of 2.5 in all college or university course work attempted.

Physical examination by the student health center or by a licensed physician. The student verifies to the coordinator of laboratory experiences that the physical examination has been completed.

Additional requirements for elementary majors

Completion of EDAF 315, EDCI 318, 470, 471, 472, 473, and 474.

Additional requirements for secondary majors

A grade point average of 2.5 in all teaching fields based on all teaching field courses attempted at KSU and at all colleges or universities attended. Completion of Blocks I and II, and EDAF 410 and EDCI 318.

Student teaching assignment request

All student teaching options require a special application called the Student Teaching Assignment Request. This form may be obtained from the office of the coordinator of laboratory experiences and returned to that office by:

September 25 for students participating in the spring professional semester.

February 25 for students participating in the fall professional semester.

Should either of these dates fall on a Saturday, Sunday, or holiday, the next working day will be considered as the due date.

Professional semester options

In addition to the conventional professional semester, the following options are available:

MITEC option

There are Multi-Institutional Teacher Education Centers in Topeka, Kansas City, and Emporia. The Kansas City center includes Kansas City, Kansas, and the suburban area. The MITEC option is a voluntary, full-semester, off-campus program. This professional semester option requires advanced planning with the education advisor and the coordinator of laboratory experiences. Students

must make special requests for this program.

CUTE option

The Cooperative Urban Teacher Education option is in an urban educational setting in Kansas City in which students spend a full semester off campus. A limited number of students is selected by application for this option.

Interruption of degree

The following College of Education policy regarding interruption of academic programs applies to all people seeking teacher certification as well as those enrolled in degree programs in the College of Education.

Students who graduate within six years from the time they enter KSU without having previously earned credit from another institution shall have the opportunity to graduate under the academic program (course and total credit requirements) in existence at the time of entrance, unless the student cannot be certified by the state of Kansas under the original entry requirements.

Students who interrupt their programs but do complete the degree or teacher education program within the six-year period shall be required to modify the entry program if the Kansas Department of Education has made changes in Kansas teaching certification requirements.

If more than six years have elapsed since original entry the student will need to complete the degree or teacher education program requirements in existence at the time he or she re-enters the University for the final and uninterrupted phase of the program.

This policy applies to students who are admitted to the University with previously attained credit as follows:

| | Allowed for completion |
|--------------------------------|-------------------------------|
| Less than 30 credits | 6 years |
| 30 to 59 credits | 5 years |
| 60 to 89 credits | 4 years |
| 90 or more credits | 3 years |

Most students who interrupt their educations for military service during peacetime do so by voluntary enlistment. In such a case the above policy would hold. In wartime or national emergency, students with good grade records might be drafted. In these cases, it would be expected that students could graduate under the requirements that existed at the time they originally entered unless certification requirements have changed, whereupon the student must modify the entry program to include the current certification requirements.

Professional certification

Initial certification

The College of Education has the responsibility to serve as the recommending agent for all KSU graduates who wish to qualify for certification. The degrees earned in the College of Education in elementary education and in secondary education will fulfill certification program requirements in the state of Kansas. Early childhood, elementary, and secondary teaching certification may be accomplished through the completion of the approved program and the appropriate degree.

Students who do not apply for the initial certification when they are eligible will be expected to meet the requirements in effect at the time they do apply for initial certification. Students enrolled in and earning degrees in colleges other than the College of Education must complete all requirements of an approved teacher education program.

The state of Kansas will issue initial teaching certificates only to individuals who have completed an approved teacher education program, received the recommendation of their college or university, and successfully passed the precertification examination. This examination consists of the three sections of the Pre-Professional Skills test and the Professional Knowledge section of the National Teachers Examination. These tests will be administered at Kansas State University several times each academic year.

The state of Kansas may not issue a teaching certificate to any applicant who has been convicted of a felony or who has had a teaching certificate revoked in another state.

People seeking initial certification who present degrees from other accredited institutions must meet all requirements of the teacher education program. For additional information, these individuals should contact the Office of Certification, 13 Bluemont Hall.

Additional certification endorsements

KSU will recommend for certification those individuals who are already certified, but who are adding an endorsement to the certificate (e.g., reading specialist, administrator, counselor, an additional teaching area). KSU may become the recommending agent for individuals presenting degrees from other accredited institutions. These persons must complete 8 hours in residence.

Recertification

Renewal applications not requesting an additional certification endorsement are sent directly to the Kansas Department of Education.

For additional information on precertification testing, applications, or procedures, contact the Office of Certification in 13 Bluemont Hall.

Approved Programs

All students preparing to be certified to teach in preschool, elementary, or secondary schools must fully complete the approved teacher education program regardless of which college awards the degree. The approved program consists of: general education studies, a major or specialization, and professional education studies.

Both degrees offered through the College of Education are four-year programs. The curricula in elementary education and in secondary education fulfill program requirements for teacher certification in the state of Kansas.

Elementary education

Bachelor of science in elementary education
Minimum of 126 hours required
Certification K-9

General education requirements

Humanities (12 hours minimum)

| | | |
|----------|---|-----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| | or | |
| SPCH 109 | Oral Communication Honors | 3 |
| | Modern language, linguistics, or literature | 3-4 |

Psychology (one course minimum)

| | | |
|-----------|--------------------|---|
| PSYCH 110 | General Psychology | 3 |
|-----------|--------------------|---|

Social sciences (9 hours minimum)

Psychology not included here. Courses must be selected from: anthropology, economics, geography (excluding GEOG 220 and 221), history, political science, and sociology. The total of social sciences and general psychology must be a minimum of 12 semester hours.

Natural sciences (12 hours minimum)

Required: At least one biological science course, at least one physical science course, at least one laboratory course.

Mathematics (3 hours minimum)

Recommended: MATH 308, Topics in Mathematics for Elementary School Teachers.

General education electives (11 hours minimum)

Additional courses of a general nature in the humanities, social sciences, natural sciences, mathematics, statistics, and computer science; students are encouraged to include course work in women's studies and minority studies from the humanities and/or social sciences.

Minimum required general education hours 50

Physical education requirement

| | | |
|--------|--------------------------------|---|
| PE 101 | Principles of Physical Fitness | 1 |
|--------|--------------------------------|---|

Pre-professional entry level

For the freshman and sophomore years, or until requirements for admission to teacher education have been satisfied, students in the College of Education will enroll in the appropriate pre-professional curriculum: elementary (EDPPE) or secondary

(EDPPS). These students are advised by a College of Education pre-professional advisor in 13 Bluemont Hall concerning the courses essential for entry into the teacher education program.

Students transferring to KSU after earning credit at another institution will be enrolled in a pre-professional program until it has been determined that requirements for admission to teacher education have been satisfied. Students attending community colleges are encouraged to plan their degree programs in a four-year sequence. The College of Education invites students to seek advice from the Center for Student and Professional Services concerning course selections.

Professional level

All students must file an application for admission to the teacher education program. When a student's application has been approved, the student is admitted to the professional level and assigned to a professional-level advisor.

Professional and specialized courses required

The following course is required for admission to teacher education:

| | | |
|---------|--|---|
| DED 100 | Pre-Professional Laboratory Experience | 1 |
|---------|--|---|

The following courses may be taken before a student is admitted to the teacher education program.

| | | |
|-----------|--|---|
| ART 425 | Art for Elementary Schools | 3 |
| EDAF 215 | Educational Implications of Growth and Development | 3 |
| EDCI 300 | Principles of Elementary Education | 3 |
| HDFS 352 | Concepts of Personal Health | 3 |
| | or | |
| PE 379 | Physical Education for the Elementary School Teacher | 3 |
| MUSIC 405 | Music for Elementary Teachers | 3 |
| ENGL 540 | Literature for Children | 3 |
| EDAF 723 | Exceptional Child in the Regular Classroom | 3 |

The application for admission to a teacher education program must be filed and approved before the student may enroll in any of the following courses. These courses must be completed before entry into the professional semester. Refer to an earlier section for specific requirements for admission to teacher education.

| | | |
|----------|---------------------------------------|---|
| EDAF 315 | Educational Psychology | 3 |
| EDCI 318 | Instructional Media and Technology | 2 |
| EDCI 470 | Science for Elementary Schools | 3 |
| EDCI 471 | Language Arts for Elementary Schools | 3 |
| EDCI 472 | Social Studies for Elementary Schools | 3 |
| EDCI 473 | Mathematics for Elementary Schools | 3 |
| EDCI 474 | Elementary School Reading | 3 |

Professional semester: see earlier information for specific prerequisites.

| | | |
|----------|---|---|
| EDCI 585 | Teaching Participation in the Elementary School | 8 |
| EDCI 600 | Reading with Practicum | 3 |
| EDAF 410 | Foundations of Education | 3 |

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Area of concentration

The hours selected in the area of concentration are in addition to those taken to meet general education requirements. A 2.5 grade point average is required in all areas for which certification is requested. Guidelines

for applicable courses are available in the Center for Student and Professional Services. Concentrations are offered in the following fields: art, biological science, communication arts, English, human development and family studies, general science, health education, mathematics, modern languages,* music, physical science, social science, special education, and speech pathology.

*Those choosing a modern language area of concentration and seeking middle level certification must demonstrate proficiency in speaking and understanding the foreign language during the semester preceding student teaching by making a satisfactory score on the Modern Language Department Oral Proficiency Interview. The interview is conducted by members of the modern language department faculty by arrangement with each individual. Students should contact the modern language education advisor for additional information on course level and other certification requirements.

Minimum hours required in the area of concentration 15

Electives

Remaining hours in the degree are unrestricted and may be taken as additional hours in the major, general education, and related courses.

Total hours required in electives 4

Total credit hours required for graduation 126

Secondary education

Bachelor of science

Minimum of 126 hours required

Certification grades 7-12

All students wishing to teach in secondary schools must fully complete the approved teacher education program regardless of which college awards the degree. The approved program consists of: general education studies, professional education studies, and teaching field studies as specifically outlined in the following sections.

General education requirements

Communications (8-9 hours)

| | | |
|-----------|------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105, | | |
| 106, 109 | Public Speaking | 3 |

Humanities (12 hours)

| | | |
|--|---|---|
| Any two of the following four: ENGL 230, 231, 233, 234 | | |
| | Literature: ENGL 361, 362, 381, 382, 261, 262, 271, 272 | 3 |
| | Restricted elective | 3 |

Social science (9 hours)

| | |
|----------------------------------|---------------------------------------|
| History: HIST 101, 102, 251, 252 | 3 |
| ANTH 200 | Introduction to Cultural Anthropology |
| | 3 |
| Restricted elective | 3 |

Quantitative sciences (6-7 hours)

| | | |
|--|--|---|
| (College Algebra is a prerequisite for statistics and computer science.) | | |
| MATH 100 | College Algebra (or higher level math course) | 3 |
| Any math course over 100 | | |
| or | | |
| STAT 320 | Elements of Statistics (or higher level statistics course) | 3 |
| or | | |
| CIS 200 | Fundamentals of Computer Programming and Lab | 4 |

Natural science (7 hours)

Biological (BIOL 198, Principles of Biology, 4 hours, is recommended.)

Physical (PHYS 101, The Physical World, 3 hours, is recommended.)

General education electives (5-7 hours)

Physical education

| | | |
|--------|--------------------------------|----|
| PE 101 | Principles of Physical Fitness | 1 |
| | | 50 |

Professional education requirements

Pre-professional education

| | | |
|---|--|---|
| Required for admission to teacher education and prerequisite for Block I. | | |
| DED 102 | Teaching as a Career | 1 |
| EDAF 215 | Educational Implications of Growth and Development | 3 |

Block I—Admission to teacher education required—courses must be taken concurrently and are a prerequisite for Block II.

| | | |
|----------|---------------------------------------|---|
| EDAF 315 | Educational Psychology | 3 |
| EDAF 323 | Exceptional Students/Secondary School | 2 |
| EDCI 376 | Core Teaching Skills and Lab | 3 |

Block II—Courses must be taken concurrently and are a prerequisite for Block III.

| | | |
|----------|---------------------------------------|---|
| EDCI 476 | Content Area Methods/Secondary School | 2 |
| EDCI 477 | Middle Level/Secondary Reading | 2 |
| EDCI 420 | Content and Reading Methods Lab | 1 |

Block III—Courses must be taken concurrently.

| | | |
|----------|---|----|
| EDCI 455 | Teaching in a Multicultural Society | 1 |
| EDAF 525 | Interpersonal Relations in the School | 1 |
| EDCI 586 | Teaching Participation/Secondary School | 12 |

Non-blocked courses—These courses must be taken after admission to teacher education and prior to student teaching.

| | | |
|----------|------------------------------------|----|
| EDAF 410 | Foundations of Education | 3 |
| EDCI 318 | Instructional Media and Technology | 2 |
| | | 36 |

Electives

Hours will vary with majors; they will bring the total hours to 126.

Teaching Fields

Agriculture education

Agriculture education requirements as seen later in this catalog are undergoing review. Students interested in this teaching field should consult with an advisor in the College of Education.

Art education (EDART)

Students preparing for K-12 certification must complete ART 425, Art for Elementary Schools, and student teaching on both the elementary and secondary levels.

| | | |
|---------------|---------------------------------|---|
| ART 100 | Design I | 2 |
| ART 190 | Drawing I | 2 |
| ART 195 | Survey of Art History I | 3 |
| ART 196 | Survey of Art History II | 3 |
| ART 200 | Design II | 2 |
| ART 210 | Drawing II | 2 |
| ART 220 | Water Color I | 2 |
| ART 225 | Figure Drawing I | 2 |
| ART 230 | Sculpture I | 2 |
| ART 235 | Printmaking I | 2 |
| ART 245 | Painting I | 2 |
| ART 265 | Ceramics I | 2 |
| ART 270 | Metalsmithing and Jewelry | 2 |
| ART 295 | Photography in Art | 2 |
| ART 545 | Twentieth Century Art History I | 3 |
| ART 690 | Techniques in Teaching Art | 2 |
| Art electives | | 4 |

Additional hours in one of the following specialized art subjects: painting, prints, ceramics, sculpture, metal-smithing and jewelry, graphic design, or drawing ... 6
45

Business education (EDBUS)

| | | |
|-----------|----------------------------------|---|
| EDAO 786 | Information Processing | 3 |
| EDAO 786 | Administrative Data Applications | 3 |
| FINAN 460 | Insurance | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| MANGT 390 | Business Law I | 3 |
| EDAO 786 | Administrative Support Services | 3 |
| EDAO 786 | Office Management | 3 |
| MANGT 420 | Management Concepts | 3 |
| MKTG 400 | Marketing | 3 |
| FINAN 450 | Business Finance | 3 |
| or | | |
| ECON 530 | Money and Banking | 3 |

Option A Accounting

| | | |
|--------------------------|------------|---|
| Minimum 6 advanced hours | | |
| ACCTG | One course | 3 |
| ACCTG | One course | 3 |

Option B Computer Literacy

| | | |
|----------|-----------------------------------|---|
| 6 hours | | |
| CIS 300 | Algorithms and Data Structures | 3 |
| EDCI 718 | Microcomputers in Instruction | 2 |
| EDCI 719 | Microcomputers in Instruction Lab | 1 |

Supporting Courses Required

| | | |
|-----------|---|----|
| ECON 110 | Economics I | 3 |
| ECON 120 | Economics II | 3 |
| POLSC 325 | U.S. Politics | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| MATH 100 | College Algebra | 3 |
| CIS 110 | Introduction to Personal Computing | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS | Language Lab (200-level, Pascal recommended) | 2 |
| or | | |
| CIS 591 | Computer Science Applications | 3 |
| FEC | Family economics elective (advisor approval required) | 3 |
| | | 67 |

English (EDENG)

Two of the following four survey courses:

| | | |
|----------|--------------------|---|
| ENGL 361 | British Survey I | 3 |
| ENGL 362 | British Survey II | 3 |
| ENGL 381 | American Survey I | 3 |
| ENGL 382 | American Survey II | 3 |

Required:

| | | |
|-----------|---|----|
| ENGL 515 | Literature and Society | 3 |
| ENGL 252 | Introduction to Literary Studies | 3 |
| ENGL 400 | Advanced Composition | 3 |
| ENGL 530 | Modern English Grammar | 3 |
| ENGL 545 | Literature for Adolescents | 3 |
| ENGL 350 | Introduction to Shakespeare | 3 |
| or | | |
| ENGL 716 | Shakespeare: Comedies and Histories | 3 |
| or | | |
| ENGL 717 | Shakespeare: Tragedies and Romances | 3 |
| ENGL | Literature electives at 600 level and above | 6 |
| ENGL | Composition elective (may include ENGL 500, or ENGL 761, or ENGL 763) | 3 |
| ENGL 490 | Development of the English Language | 3 |
| PSYCH 650 | Psychology of Language | 3 |
| | | 39 |

English/journalism (EDENJ)

Two of the following:

ENGL 361 British Survey I 3
 ENGL 362 British Survey II 3
 ENGL 381 American Survey I 3
 ENGL 382 American Survey II 3

Required:

ENGL 515 Literature and Society 3
 ENGL 252 Introduction to Literary Studies 3
 ENGL 530 Modern English Grammar 3
 ENGL 490 Development of the English Language 3

ENGL 350 Introduction to Shakespeare 3
 or
 ENGL 716 Shakespeare: Comedies and History 3
 or
 ENGL 717 Shakespeare: Tragedies and Romance 3

ENGL 545 Literature for Adolescents 3
 Literature elective above 600 level 3

JMC 235 Introduction to Mass Communications 3
 JMC 275 News and Feature Writing 3
 JMC 300 Editing and Design 3
 JMC 310 Photography I 3
 JMC 605 Supervision of School Publications 3
 JMC 665 Law of Mass Communications 3
 PSYCH 650 Psychology of Language 3

Home economics

See Vocational Home Economics.

Journalism (EDJOR)

JMC 235 Introduction to Mass Communications 3
 JMC 275 News and Feature Writing 3
 JMC 300 Editing and Design 3
 JMC 310 Photography I 3
 JMC 605 Supervision of School Publications 3
 JMC 665 Law of Mass Communications 3

Electives (12 hours):

RTV 237 Writing for the Electronic Media ... 3
 RTV 240 Audio I 3
 or
 RTV 250 Television Video I 3

JMC 320 Principles of Advertising 3
 JMC 360 Publications Practice 1-4
 JMC 380 Advanced News and Feature Writing 3

JMC 480 Advanced Editing and Design 3
 JMC 510 Yearbook Editing and Management 2

JMC 555 Advertising Copy and Layout 3
 JMC 660 History of Journalism 3
 JMC 685 Mass Communications: Ethics and Issues 3

30

Mathematics (EDMTH)

MATH 220 Analytic Geometry and Calculus I .. 4
 MATH 221 Analytic Geometry and Calculus II 4
 MATH 222 Analytic Geometry and Calculus III 4
 MATH 240 Elementary Differential Equations 4

Approved mathematics courses numbered 300-799 (18 hours):

MATH 312 Finite Application of Mathematics 3
 MATH 511 Introduction to Algebraic Systems .. 3
 or
 MATH 512 Introduction to Modern Algebra I .. 3

MATH 520 Foundations of Analysis 3
 MATH 521 The Real Number System 3
 MATH 570 History of Mathematics 3
 MATH 572 Foundations of Geometry 3
 MATH 573 Transformation and Vector Geometry 3

MATH 791 Topics in Mathematics for Secondary School Teachers 3

Supporting courses required:

STAT 320 Elements of Statistics 3
 or
 STAT 510 Introductory Probability and Statistics I 3

CIS Computer science with language course 3-4

40-41

It is recommended that a course in physics be included as part of general education.

Modern languages (EDMLA)

Modern language majors must demonstrate proficiency in speaking and understanding the foreign language during the semester preceding student teaching by making a satisfactory score on the Modern Language Department Oral Proficiency Interview. The interview is conducted by members of the modern language department faculty by arrangement with each individual. Students should contact the modern language education advisor for additional information.

French

30 hours at 200 level or above to include the following:

FREN 211 French III 4
 FREN 213 French IV 3
 FREN 214 French Conversation IVA 2
 FREN 511 Masterpieces of French Literature I 3
 FREN 512 Masterpieces of French Literature II 3
 FREN 513 French Composition and Conversation 3
 FREN 514 French Civilization 3
 FREN 719 Advanced Spoken and Written French 3

FREN French electives at 500 and above 6

30

German

30 hours at 200 level or above to include the following:

GRMN 221 German III 4
 GRMN 223 German IV 3
 GRMN 224 German Conversation IVA 2
 GRMN 521 Introduction to German Literature I 3
 GRMN 522 Introduction to German Literature II 3
 GRMN 523 German Composition 3
 GRMN 530 German Civilization 3
 GRMN 731 Advanced Spoken and Written German 3

GRMN German electives at 500 and above 6

30

Spanish

30 hours at 200 level or above to include the following:

SPAN 261 Spanish III 4
 SPAN 263 Spanish IV 3
 SPAN 264 Elementary Spanish Conversation IVA 2
 SPAN 563 Introduction to the Literature of Spanish America 3
 SPAN 564 Spanish Composition and Grammar 3
 SPAN 565 Spanish Civilization 3
 or
 SPAN 566 Hispanic-American Civilization 3
 SPAN 567 Introduction to the Literature of Spain 3

SPAN 571 Advanced Spanish Conversation ... 2
 SPAN Spanish electives at 500 and above .. 7

30

Certification to teach elementary school foreign language is an optional extension of secondary school certification. The following must be added to the

requirements for secondary modern foreign language certification if elementary foreign language certification is desired:

EDCI 585 Teaching Participation in the Elementary School Var.
 EDCI 620 Foreign Language Methods for Elementary Schools (offered spring of even years) 3

Speech (EDSPH)

All speech education majors are required to complete 36 hours of speech and theatre courses in addition to SPCH 105 or 106, Public Speaking IA or I.

The following courses are required:

SPCH 325 Argumentation and Debate 3
 SPCH 321 Public Speaking II 3
 SPCH 330 Rhetoric in Western Thought 3
 SPCH 426 Coaching and Directing Speech Activities 3

SPCH 500 level or above in general speech 3
 or
 THTRE 500 level or above in theatre 3

SPCH 322 Interpersonal Communication 3
 or
 SPCH 326 Small Group Discussion 3

THTRE 261 Fundamentals of Acting 3
 THTRE 263 Oral Interpretation of Literature ... 3
 THTRE 266 Technical Production I 3
 THTRE 370 Dramatic Structure 3
 THTRE 565 Principles of Directing 3

JMC 235 Introduction to Mass Communications 3
 or
 SPCH 235 Introduction to the Art of Film 3

36

Natural sciences

Biological science (EDBSC)

BIOL 198 Principles of Biology 4
 BIOL 201 Organismic Biology 5
 BIOL 455 General Microbiology 4
 BIOL 303 Ecology of Environmental Problems 3
 or
 BIOL 529 Fundamentals of Ecology 3
 or
 BIOL 631 Ecology 3

ASI 500 Genetics 3
 or
 BIOL 400 Human Genetics 3

Eight hours of biology electives. Many different biology courses may be used but it is suggested that the following courses be considered:

ENTOM 312 General Entomology 2
 ENTOM 313 General Entomology Laboratory ... 1
 BIOL 310 Biology and the Future of Man 3
 BIOL 541 Cell Biology 3
 BIOL 510 Embryology 3
 BIOL 560 Evolutionary Biology 2

Chemistry courses required:

CHM 210 Chemistry I 4
 CHM 230 Chemistry II 4
 CHM 240 Environmental Chemistry Laboratory 1
 CHM 350 General Organic Chemistry 3

Other required courses:

GEOL 130 Elementary Geology Laboratory ... 1
 GEOL 512 Earth Science 3
 PHYS 115 Descriptive Physics 4
 EDCI 614 Lab Techniques in Teaching Science 3

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Chemistry (EDCHM)

CHM 210 Chemistry I 4
 CHM 230 Chemistry II 4
 CHM 271 Chemical Analysis 4
 CHM 350 General Organic Chemistry 3
 CHM 351 General Organic Chemistry Laboratory 2

Education Teaching Fields

| | | |
|------------------------------|---|-----------|
| CHM 500 | General Physical Chemistry | 3 |
| CHM | Chemistry electives | 5 |
| Supporting courses required: | | |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| EDCI 614 | Laboratory Techniques in Teaching Science | 3 |
| | | 53 |

Additional courses recommended:

| | | |
|----------|------------------------------------|------|
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| CHM 799 | Problems in Chemistry | Var. |

It is highly recommended that additional courses be selected to fulfill requirements for an additional teaching area in biology or physics. The course selection should be made in consultation with the science education advisor.

Earth science (EDESC)

| | | |
|----------|-------------------------------|---|
| GEOL 100 | Geology I | 3 |
| GEOL 130 | Elementary Geology Laboratory | 1 |
| GEOL 502 | Mineralogy | 3 |
| | or | |
| GEOL 503 | Petrology | 3 |
| GEOL 520 | Geomorphology | 4 |
| GEOG 220 | Environmental Geography I | 4 |

Supporting courses required:

| | | |
|----------|---|-----------|
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 240 | Environmental Chemistry Laboratory | 1 |
| MATH 100 | College Algebra | 3 |
| MATH 150 | Plane Trigonometry | 3 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| PHYS 191 | Descriptive Astronomy | 3 |
| PHYS 193 | Descriptive Meteorology | 3 |
| EDCI 614 | Laboratory Techniques in Teaching Science | 3 |
| | | 57 |

It is highly recommended that additional courses be selected to fulfill requirements for an additional teaching area in biology, physics, or chemistry. The course selection should be made in consultation with the science education advisor.

Physical science (EDPSC)

| | | |
|--|---------------------------------------|---|
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| Six hours physics electives selected from the following: | | |
| PHYS 191 | Descriptive Astronomy | 3 |
| PHYS 193 | Descriptive Meteorology | 3 |
| PHYS 506 | Physics Laboratory I | 3 |
| PHYS 551 | Introduction to Modern Physics | 3 |
| | or | |
| PHYS 452 | Contemporary Physics | 4 |
| PHYS 636 | Physical Measurements Instrumentation | 4 |

Supporting courses required:

| | | |
|----------|--------------------------------------|---|
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 240 | Environmental Chemistry Laboratory | 1 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| GEOL 100 | Geology I | 3 |
| GEOL 130 | Elementary Geology Laboratory | 1 |
| GEOL 512 | Earth Science | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 201 | Organismic Biology | 5 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |

| | | |
|----------|---|-----------|
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| EDCI 614 | Laboratory Techniques in Teaching Science | 3 |
| | | 65 |

Physics (EDPHY)

| | | |
|----------|---------------------------------------|---|
| PHYS 017 | Colloquium in Physics | 0 |
| PHYS 213 | Engineering Physics I | 5 |
| PHYS 214 | Engineering Physics II | 5 |
| PHYS 506 | Physics Laboratory I | 3 |
| PHYS 522 | Mechanics I | 3 |
| PHYS 532 | Electricity and Magnetism | 3 |
| PHYS 551 | Introduction to Modern Physics | 3 |
| PHYS 636 | Physical Measurements Instrumentation | 4 |

Supporting courses required:

| | | |
|----------|--|-----------|
| BIOL | One biology course (selection must be approved by the education advisor) | 3-4 |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 240 | Environmental Chemistry Laboratory | 1 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| MATH 240 | Series and Differential Equations | 4 |
| EDCI 614 | Laboratory Techniques in Teaching Science | 3 |
| | | 57 |

Additional courses recommended:

| | | |
|----------|-------------------------------|---|
| GEOL 130 | Elementary Geology Laboratory | 1 |
| GEOL 512 | Earth Science | 3 |

It is highly recommended that additional courses be selected to fulfill requirements for an additional teaching area in chemistry or mathematics. The course selection should be made in consultation with the science education advisor.

Social sciences**Economics (EDEC)**

| | | |
|-----------|---|----|
| Required: | | |
| ECON 110 | Economics I | 3 |
| ECON 120 | Economics II | 3 |
| ECON 510 | Intermediate Macroeconomics | 3 |
| ECON 520 | Intermediate Microeconomics | 3 |
| | Fifteen hours of economics (500 level and up) | 15 |

Supporting courses required:

| | | |
|-----------|---|---|
| GEOG 100 | World Regional Geography | 3 |
| | or | |
| GEOG 440 | Geography of Natural Resources | 3 |
| | or | |
| GEOG 450 | Geography of Economic Behavior | 3 |
| HIST 251 | U.S. History to 1877 | 3 |
| HIST 252 | U.S. History Since 1877 | 3 |
| MATH 100 | College Algebra | 3 |
| POLSC 110 | Introduction to Political Science | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| STAT 350 | Business and Economic Statistics I | 3 |
| | or | |
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |

One of the following:

| | | |
|-----------|--------------------------------------|---|
| ACCTG 211 | Financial Accounting | 4 |
| MATH 205 | General Calculus and Linear Algebra | 3 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| STAT 351 | Business and Economics Statistics II | 3 |

Social science electives:

| | |
|--------------------------------------|---|
| Additional U.S. history courses | 6 |
| or | |
| Additional political science courses | 9 |

Geography (EDGEO)*

| | | |
|---------------------------------|--------------------------------|---|
| Required: | | |
| GEOG 100 | World Regional Geography | 3 |
| | or | |
| GEOG 200 | Man Space Environment | |
| GEOG 220 | Environmental Geography I | 4 |
| GEOG 221 | Environmental Geography II | 4 |
| GEOG 440 | Geography of Natural Resources | 3 |
| GEOG 450 | Geography of Economic Behavior | 3 |
| GEOG 470 | Cartography | 3 |
| Nine hours at specified levels: | | |
| GEOG 300 | | 9 |
| GEOG 500 | | |
| GEOG 700 | | |

Supporting courses required:

| | | |
|-----------|--|---|
| HIST 101 | Western Civilization: The Rise of Europe | 3 |
| HIST 102 | Western Civilization: The Modern Era | 3 |
| HIST 251 | History of the United States to 1877 | 3 |
| HIST 252 | History of the United States Since 1877 | 3 |
| POLSC 110 | Introduction to Political Science | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| STAT 330 | Elementary Statistics for the Social Science | 3 |

Social science electives:

| | |
|--------------------------------------|---|
| Six additional hours of U.S. History | 6 |
| or | |
| Nine hours of political science | 9 |

*A minimum of 12 hours of U.S. history, political science, or world history is required prior to student teaching.

History (EDHST)*

| | | |
|-----------|--|---|
| Required: | | |
| HIST 101 | Western Civilization: The Rise of Europe | 3 |
| HIST 102 | Western Civilization: The Modern Era | 3 |
| HIST 251 | United States History to 1877 | 3 |
| HIST 252 | United States History Since 1888 | 3 |
| HIST 397 | Junior Seminar | 3 |
| HIST 599 | Senior Seminar for Secondary Teachers | 3 |

Twelve hours (500 level and above) distributed in three of these fields:

Ancient medieval and early modern Europe
Modern Europe including Britain
The Third World (Asia, Africa, Latin America)
The United States
History of science, technology, and the military

Supporting courses required:

| | | |
|-----------|-----------------------------------|---|
| ECON 110 | Economics I | 3 |
| GEOG 100 | World Regional Geography | 3 |
| POLSC 110 | Introduction to Political Science | 3 |
| POLSC | Political science elective | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |

*A minimum of 12 hours or U.S. history, political science, or world history is required prior to student teaching.

Political science (EDPLS)*

| | | |
|-----------|---|----|
| Required: | | |
| POLSC 110 | Introduction to Political Science | 3 |
| | Eighteen hours of political science courses | 18 |

Supporting courses required:

| | | |
|-----------|--|---|
| ECON 110 | Economics I | 3 |
| GEOG 100 | World Regional Geography | 3 |
| HIST 101 | Western Civilization: The Rise of Europe | 3 |
| HIST 102 | Western Civilization: The Modern Era | 3 |
| HIST 251 | United States History to 1877 | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| | U.S. or world history courses | 6 |

*A minimum of 12 hours of U.S. history, political science, or world history is required prior to student teaching.

Sociology (EDSOC)*

Required:

| | | |
|---|------------------------------|---|
| SOCIO 211 | Introduction to Sociology | 3 |
| SOCIO 520 | Methods of Social Research I | 4 |
| SOCIO 511 | Comparative Social Theories | 3 |
| Nine hours of sociology (400 level and above) | | 9 |
| Nine hours of sociology (500-799) | | 9 |
| Six hours social science electives: | | |
| U.S. history or political science courses | | 6 |

Supporting courses required:

| | | |
|-----------|--------------------------------------|---|
| ECON 110 | Economics I | 3 |
| GEOG 100 | World Regional Geography | 3 |
| HIST 102 | Western Civilization: The Modern Era | 3 |
| HIST 251 | United States History to 1877 | 3 |
| HIST 252 | United States History Since 1877 | 3 |
| POLSC 110 | Introduction to Political Science | 3 |
| POLSC | Political science electives | 3 |

*A minimum of 12 hours of U.S. history, political science, or world history is required prior to student teaching.

Social science
U.S. history, U.S. government, and world history

| | | |
|-----------|---------------------------------------|---|
| HIST 101 | Rise of Europe | 3 |
| HIST 102 | Modern Era | 3 |
| HIST 568 | Junior Seminar | 3 |
| HIST 500+ | Early U.S. | 3 |
| HIST 500+ | Recent U.S. | 3 |
| POLSC 301 | Introduction to Political Thought | 3 |
| POLSC 325 | U.S. Politics | 3 |
| POLSC 333 | World Politics | 3 |
| POLSC 344 | Introduction to Comparative Politics | 3 |
| GEOG 100 | World Regional Geography | 3 |
| ECON 110 | Economics I | 3 |
| ECON 120 | Economics II | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| ANTH 200 | Introduction to Cultural Anthropology | 3 |

Nine hours from the following:

| | | |
|---|--------------------------------|---|
| HIST 599 | Senior Seminar | 3 |
| POLSC 400 | Political Inquiry and Analysis | 3 |
| HIST 500+ | U.S. History | 3 |
| One non-Western social science | | 3 |
| HIST 500+ One European history course | | 3 |
| One social science women's studies course | | 3 |
| One social science American ethnic studies course | | 3 |

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Vocational home economics education

Students planning to be vocational home economics teachers must complete the approved program in vocational home economics education. Completion of this program satisfies state of Kansas program requirements for vocational home economics certification for grades 7-12.

Professional education requirements

| | | |
|----------|--|---|
| EDAO 320 | Exploration in Home Economics Education | 1 |
| EDAF 215 | Educational Implications of Growth and Development | 3 |

The following courses must be completed before entry into the professional semester:

| | | |
|----------|---|---|
| EDAF 315 | Educational Psychology | 3 |
| EDAF 323 | Exceptional Student in the Secondary School | 2 |
| EDCI 376 | Core Teaching Skills and Lab | 3 |
| EDCI 420 | Content and Reading Methods Lab | 1 |
| EDAO 550 | Methods of Teaching Home Economics | 2 |
| EDAO 620 | Principles and Philosophy of Vocational Education | 3 |
| EDCI 318 | Instructional Media and Technology | 2 |
| EDCI 477 | Middle Level/Secondary Reading | 2 |
| EDAI 610 | Occupational Home Economics | 2 |

| | | |
|---|--|-----------|
| Professional semester (see information earlier for specific prerequisites): | | |
| EDAF 525 | Interpersonal Relations in the School | 1 |
| EDCI 455 | Teaching in a Multicultural Society | 1 |
| EDAO 721 | Program Planning in Vocational Education | 3 |
| EDAO 586 | Teaching Participation in Secondary School | 12 |
| | | 41 |

Optional Secondary Certification Programs

In addition to the teaching fields described above, optional secondary certification programs are available. Certification in one or more of these optional programs is available only to students who have successfully completed an approved full certification program in another (first or primary) teaching area.

These optional programs allow individuals the opportunity to teach in more than one area. These options lead to full certification in the subject or subject area for grades 7 through 12. A cumulative 2.5 grade point average is required in all courses attempted in the subject or subject area. KSU will recommend an endorsement to the teaching certificate for any additional teaching area when all requirements have been completed, provided all requirements of the approved degree program and the secondary area of certification have also been completed.

Art

| | | |
|---------|---------------------------------|---|
| ART 100 | Design I | 2 |
| ART 190 | Drawing I | 2 |
| ART 195 | Survey of Art History I | 3 |
| ART 196 | Survey of Art History II | 3 |
| ART 200 | Design II | 2 |
| ART 210 | Drawing II | 2 |
| ART 220 | Water Color I | 2 |
| ART 230 | Sculpture I | 2 |
| ART 235 | Printmaking I | 2 |
| ART 245 | Painting I | 2 |
| ART 265 | Ceramics I | 2 |
| ART 270 | Metalsmithing and Jewelry | 2 |
| ART 275 | Weaving I | 2 |
| ART 295 | Photography in Art | 2 |
| ART 545 | Twentieth Century Art History I | 3 |

Six additional hours in an area of concentration in one of the following: painting, printmaking, sculpture, metals, drawing, graphic design, ceramics

| | | |
|----------|--|-----------|
| EDCI 476 | Methods of Teaching in the Secondary Schools | 2 |
| | | 41 |

Business

| | | |
|-----------|----------------------------------|---|
| EDAO 786 | Information Processing | 3 |
| EDAO 786 | Administrative Data Applications | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| MANGT 390 | Business Law I | 3 |
| FINAN 460 | Insurance | 3 |
| EDAO 786 | Topics/Office Management | 3 |

| | | |
|----------|--|-----------|
| ECON 110 | Economics I | 3 |
| ECON 120 | Economics II | 3 |
| EDCI 476 | Methods of Teaching Business in the Secondary School | 2 |
| EDAO 786 | Administrative Support Services | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS | Computer Language Laboratory (200 level) | 2 |
| | | 36 |

This prepares a student to teach typing, business law, business economics, and bookkeeping.

Computer studies

| | | |
|---|--|--------------|
| 1. Computer science component (a or b, followed by c) | | |
| a. CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS 207 | PASCAL language lab | 2 |
| or | | |
| b. CIS 591 | Computer Science Applications | 3 |
| Followed by | | |
| c. CIS 300 | Algorithmic Processes | 3 |
| 2. Professional knowledge component | | |
| EDCI 476 | Methods of Teaching in the Secondary School (Computer Studies) | 2 |
| EDCI 718 | Microcomputers in Instruction | 2 |
| EDCI 719 | Microcomputers in Instruction Lab | 1 |
| EDCI 786 | Microcomputers in Management of Instruction | 3 |
| or | | |
| CIS 110 | Introduction to Personal Computing | 3 |
| | | 14-15 |

English

Take two of the following four courses:

| | | |
|-----------|---|-----------|
| ENGL 361 | British Survey I | 3 |
| ENGL 362 | British Survey II | 3 |
| ENGL 381 | American Survey I | 3 |
| ENGL 382 | American Survey II | 3 |
| ENGL 515 | Literature and Society | 3 |
| ENGL 400 | Advanced Composition | 3 |
| ENGL 530 | Modern English Grammar | 3 |
| ENGL 545 | Literature for Adolescents | 3 |
| ENGL 350 | Introduction to Shakespeare | 3 |
| ENGL 490 | Development of the English Language | 3 |
| EDCI 476 | Methods of Teaching English in Secondary School | 2 |
| PSYCH 650 | Psychology of Language | 3 |
| | | 29 |

Journalism

| | | |
|----------|--|-----------|
| JMC 275 | News and Feature Writing | 3 |
| JMC 285 | Advanced News and Feature Writing | 3 |
| JMC 300 | Editing and Design | 3 |
| JMC 665 | Law of Mass Communications | 3 |
| EDCI 476 | Methods of Teaching English/Journalism in the Secondary School | 2 |
| | | 14 |

Health

This program is under review. Please see an advisor in the College of Education.

Mathematics

| | | |
|----------|---------------------------------------|---|
| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
| MATH 221 | Analytic Geometry and Calculus II .. | 4 |
| MATH 222 | Analytic Geometry and Calculus III .. | 4 |
| MATH 572 | Foundations of Geometry .. | 3 |
| MATH 511 | Introduction to Algebraic Systems .. | 3 |
| MATH 512 | Introduction to Modern Algebra .. | 3 |

Six semester hours of electives chosen from the following:

| | | |
|----------|---------------------------------------|---|
| MATH 240 | Elementary Differential Equations .. | 4 |
| MATH 570 | History of Mathematics .. | 3 |
| MATH 312 | Finite Applications of Mathematics .. | 3 |
| MATH 520 | Foundations of Analysis .. | 3 |
| MATH 521 | The Real Number System .. | 3 |

Supporting courses required:

| | | |
|----------|--|-----|
| STAT 320 | Elements of Statistics .. | 3 |
| CIS | Computer Science with Language Course .. | 3-4 |
| EDCI 476 | Methods of Teaching Mathematics in the Secondary School .. | 2 |

32-33

Supporting courses recommended: a course in physics.

General mathematics

| | | |
|----------|---|-----|
| MATH 100 | College Algebra .. | 3 |
| MATH 308 | Topics in Mathematics for Elementary School Teachers .. | 4 |
| MATH 521 | The Real Number System .. | 3 |
| MATH 205 | General Calculus and Linear Algebra .. | 3 |
| MATH 312 | Finite Applications in Mathematics .. | 3 |
| MATH 570 | History of Mathematics .. | 3 |
| MATH 572 | Foundations of Geometry .. | 3 |
| EDCI 476 | Methods of Teaching Secondary School Mathematics .. | 2 |
| STAT 320 | Elements of Statistics .. | 3 |
| CIS | Computer Science with Language .. | 3-4 |

26-28

Modern foreign language

Students seeking modern language endorsement must demonstrate proficiency in speaking and understanding the foreign language during the semester preceding student teaching by making a satisfactory score on the Modern Language Department Oral Proficiency Interview. The interview is conducted by members of the modern language department faculty by arrangement with each individual. Students should contact the modern language education advisor for additional information.

French

| | | |
|----------|---|---|
| FREN 211 | French III .. | 4 |
| FREN 213 | French IV .. | 3 |
| FREN 214 | French Conversation IVA .. | 2 |
| FREN 511 | Masterpieces of French Literature I .. | 3 |
| FREN 512 | Masterpieces of French Literature II .. | 3 |
| FREN 513 | French Composition and Conversation .. | 3 |
| FREN 514 | French Civilization .. | 3 |
| FREN | French electives at 500 or above .. | 6 |
| EDCI 476 | Methods of Teaching Foreign Language in the Secondary School .. | 2 |

German

| | | |
|----------|---|---|
| GRMN 221 | German III .. | 4 |
| GRMN 223 | German IV .. | 3 |
| GRMN 224 | German Conversation IVA .. | 2 |
| GRMN 521 | Introduction to German Literature I .. | 3 |
| GRMN 522 | Introduction to German Literature II .. | 3 |
| GRMN 523 | German Composition .. | 3 |
| GRMN 530 | German Civilization .. | 3 |
| GRMN | German electives at 500 or above .. | 6 |
| EDCI 476 | Methods of Teaching Foreign Language in the Secondary School .. | 2 |

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Spanish

| | | |
|----------|---|---|
| SPAN 261 | Spanish III .. | 4 |
| SPAN 263 | Spanish IV .. | 3 |
| SPAN 264 | Elementary Spanish Conversation IVA .. | 2 |
| SPAN 564 | Spanish Composition and Grammar .. | 3 |
| SPAN 565 | Spanish Civilization .. | 3 |
| SPAN 566 | Hispanic-American Civilization .. | 3 |
| SPAN | Spanish electives at 500 or above .. | 6 |
| SPAN 563 | Spanish-American Masterpieces .. | 3 |
| SPAN 567 | Spanish Masterpieces .. | 3 |
| EDCI 476 | Methods of Teaching Foreign Language in the Secondary School .. | 2 |

26

Modern foreign language elementary school

Certification to teach elementary school foreign language is an optional extension of secondary school certification. The following must be added to the requirements for secondary modern foreign language certification:

| | | |
|----------|---|------|
| EDCI 620 | Foreign Language Methods for Elementary Schools (offered spring of even years) .. | 3 |
| EDCI 585 | Teaching Participation in the Elementary School .. | Var. |

Natural science**Biology**

| | | |
|----------|--|---|
| BIOL 198 | Principles of Biology .. | 4 |
| BIOL 201 | Organismic Biology .. | 5 |
| BIOL 303 | Ecology of Environmental Problems .. | 3 |
| BIOL 529 | Fundamentals of Ecology .. | 3 |
| CHM 110 | General Chemistry .. | 5 |
| CHM 210 | Chemistry I .. | 4 |
| EDCI 614 | Laboratory Techniques in Teaching Science .. | 3 |
| EDCI 476 | Methods of Teaching Science in the Secondary School .. | 2 |

Plus a minimum of 6 semester hours chosen from the following:

| | | |
|-----------|----------------------------------|---|
| BIOL 310 | Biology and the Future of Man .. | 3 |
| ENTOM 312 | General Entomology .. | 2 |
| ENTOM 313 | General Entomology Laboratory .. | 1 |
| BIOL 430 | Population Biology .. | 4 |
| ASI 500 | Genetics .. | 3 |
| BIOL 455 | General Microbiology .. | 4 |

27-28

Some other biology department courses may be considered for meeting the above requirements. It is important that they be approved in advance by a science education advisor, however, since most biology courses are designed to meet the needs of curricula other than the classical natural sciences and would not satisfy the requirements.

Highly recommended, but not required:

| | | |
|----------|------------------------|---|
| CHM 230 | Chemistry II .. | 4 |
| PHYS 115 | Descriptive Physics .. | 4 |
| GEOL 512 | Earth Science .. | 3 |

Chemistry

| | | |
|----------|--|---|
| CHM 210 | Chemistry I .. | 4 |
| CHM 230 | Chemistry II .. | 4 |
| CHM 240 | Environmental Chemistry Laboratory .. | 1 |
| CHM 350 | General Organic Chemistry .. | 3 |
| BIOL 198 | Principles of Biology .. | 4 |
| PHYS 113 | General Physics I .. | 4 |
| PHYS 115 | Descriptive Physics .. | 4 |
| EDCI 614 | Laboratory Techniques in Teaching Science .. | 3 |
| EDCI 476 | Methods of Teaching Science in the Secondary School .. | 2 |

Plus a minimum of 3 semester hours chosen from the following:

| | | |
|----------|-------------------------------|---|
| BIOL 201 | Organismic Biology .. | 5 |
| CHM 500 | General Physical Chemistry .. | 3 |
| GEOL 512 | Earth Science .. | 3 |
| GEOL 100 | Introductory Geology .. | 3 |
| PHYS 114 | General Physics II .. | 4 |
| PHYS 191 | Descriptive Astronomy .. | 3 |
| PHYS 193 | Descriptive Meteorology .. | 3 |

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Some other natural science courses may be considered for meeting the above requirements. It is important that they be approved in advance by a science education advisor, however, since most science courses are designed to meet the needs of curricula other than the classical natural sciences and would not satisfy the requirements.

Highly recommended, but not required:

| | | |
|----------|-------------------------------------|---|
| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
|----------|-------------------------------------|---|

Earth science or space science

Core:

| | | |
|----------|--|---|
| GEOL 512 | Earth Science .. | 3 |
| GEOL 100 | Introductory Geology .. | 3 |
| GEOL 130 | Elementary Geology Laboratory .. | 1 |
| BIOL 198 | Principles of Biology .. | 4 |
| CHM 210 | Chemistry I .. | 4 |
| PHYS 113 | General Physics I .. | 4 |
| PHYS 115 | Descriptive Physics .. | 4 |
| EDCI 614 | Laboratory Techniques in Teaching Science .. | 3 |
| EDCI 476 | Methods of Teaching Science in the Secondary School .. | 2 |

Plus a minimum of two courses chosen from the following:

| | | |
|----------|----------------------------|---|
| GEOL 200 | Historical Geology .. | 4 |
| GEOL 502 | Mineralogy .. | 3 |
| GEOL 503 | Petrology .. | 3 |
| GEOL 520 | Geomorphology .. | 4 |
| GEOL 105 | Oceanography .. | 3 |
| PHYS 191 | Descriptive Astronomy .. | 3 |
| PHYS 193 | Descriptive Meteorology .. | 3 |

30-32

Some other geology or physics courses may be considered for meeting the above requirements. It is important that they be approved in advance by a science education advisor, however, since most science courses are designed for curricula other than the classical natural sciences and would not satisfy the requirements.

Highly recommended, but not required:

| | | |
|----------|------------------------------|---|
| GEOL 220 | Environmental Geography 1 .. | 4 |
|----------|------------------------------|---|

General science

Core:

| | | |
|----------|--------------------------|---|
| BIOL 198 | Principles of Biology .. | 4 |
| CHM 110 | General Chemistry .. | 5 |
| CHM 210 | Chemistry I* | 4 |
| GEOL 512 | Earth Science .. | 3 |

PHYS 113 General Physics I 4
or
 PHYS 115 Descriptive Physics 4
 EDCI 614 Laboratory Techniques in Teaching Science 3
 EDCI 476 Methods of Teaching Science in the Secondary School 2

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*Required for chemistry and physics options.

The core and one of the following options must total a minimum of 27 semester hours.

Options:
Biology
 BIOL 201 Organismic Biology 5
 BIOL 303 Ecology of Environmental Problems 3
or
 BIOL 529 Fundamentals of Ecology 3
Chemistry
 CHM 230 Chemistry II 4
 CHM 271 Chemical Analysis 4
or
 CHM 350 General Organic Chemistry 3
and
 CHM 351 General Organic Chemistry Laboratory 2

Physics
 A minimum of 12 hours
 PHYS 114 General Physics II 4
 PHYS One physics course that has Physics II as a prerequisite
 PHYS Additional physics courses

Earth science
 GEOL 100 Introductory Geology 3
 GEOL 130 Elementary Geology Laboratory 1

At least two courses selected from the following:
 GEOL 105 Oceanography 3
 GEOL 200 Historical Geology 4
 GEOL 502 Mineralogy 3
 GEOL 503 Petrology 3
 GEOL 520 Geomorphology 3
 PHYS 191 Descriptive Astronomy 3
 PHYS 193 Descriptive Meteorology 3

Some other natural science courses may be considered for meeting the above requirements. It is important that they be approved in advance by a science education advisor, however, since most science courses are designed to meet the needs of curricula other than the classical natural science and would **not** satisfy the requirements.

Physics
 BIOL 198 Principles of Biology **or**
 BIOL 201 Organismic Biology 4-5
 CHM 210 Chemistry I 4
 PHYS 113 General Physics I 4
 PHYS 114 General Physics II 4
 PHYS 452 Contemporary Physics 4
 GEOL 512 Earth Science 3
 GEOG 440 Geography of Natural Resources **or**
 BIOL 303 Ecology of Environmental Problems **or**
 BIOL 310 Biology and the Future of Man 3
 CIS 200 Fundamentals of Computer Programming 2
 CIS 206 BASIC Language Laboratory **or**
 CIS 207 PASCAL Language Laboratory 2
or other approved language
 MATH 205 General Calculus and Linear Algebra 3
 EDCI 476 Methods of Teaching Science in the Secondary School 2
 EDCI 614 Laboratory Techniques in Teaching Science 3

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Other natural science courses may be considered for meeting the above requirements. It is important that they be approved in advance by a science education advisor, however, since most science courses are designed to meet the needs of curricula other than the classical natural sciences and would **not** satisfy the requirements.

Highly recommended, but not required:
 MATH 220 Analytic Geometry and Calculus I .. 4
 MATH 221 Analytic Geometry and Calculus II 4

Physical science
 PHYS 115 Descriptive Physics 4
 CHM 210 Chemistry I 4
 BIOL 198 Principles of Biology 4
 GEOL 512 Earth Science 3
 GEOL 100 Introductory Geology 3
 GEOL 130 Elementary Geology Lab 1
 MATH 210 Technical Calculus I 3
 EDCI 614 Laboratory Techniques in Teaching Science 3
 EDCI 476 Methods of Teaching Science in the Secondary School 2

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Physical education
 PE 325 History and Philosophy of Physical Education 3
or
 PE 340 Social and Psychological Dimensions of Physical Education .. 3

Required:
 PE 315 Treatment of Athletic Injuries 3
 PE 320 Motor Development and Learning .. 3
 PE 330 Kinesiology 3
 PE 335 Physiology of Exercise 3
 PE 359 Administration of Physical Education and Athletic Programs .. 3
 PE 376 First Aid and CPR 1
 PE 410 Gymnastics for Secondary Schools .. 3
 PE 415 Team Sports for Secondary Schools 3
 PE 420 Rhythms for Secondary Schools 3
 PE 425 Individual and Dual Sports for Secondary Schools 3
 PE 561 Adapted Physical Education 3
 PE 710 Measurement and Evaluation in Physical Education 3
 EDCI 476 Methods of Teaching Physical Education in the Secondary School 2

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Students are advised to include the following courses in their general education requirements. These courses are prerequisites to the requirements listed above.
 SOCIO 211 Introduction to Sociology 3
 STAT 320 Elements of Statistics (Pr.: MATH 100) 3
 BIOL 198 Principles of Biology 4
 BIOL 240 Structure and Function of the Human Body 6

Psychology
 PSYCH 110 General Psychology 3
 PSYCH 250 Experimental Methods in Psychology 4
 PSYCH 520 Life Span Personality Development 3
 PSYCH 535 Social Psychology 3
 PSYCH 460 Information Processing and Memory 3
or
 PSYCH 475 Principles of Learning and Motivation 3
or
 PSYCH 480 Fundamentals of Perception and Sensation 3

Supporting courses required:
 STAT 320 Elements of Statistics 3
or
 STAT 330 Elementary Statistics for the Social Sciences 3

EDAF 715 Principles of Measurement 3
 EDCI 476 Methods of Teaching Social Science in the Secondary School 2

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Social science

The following three social science teaching fields may be completed only in conjunction with U.S. history, world history, and U.S. government.

Anthropology and sociology
 ANTH 260 Introduction to Archaeology 3
 SOCIO 540 Social Organization 3
 SOCIO 550 Introduction to Social Interaction .. 3
One of the following: 3
 ANTH 220 Introduction to Linguistics Anthropology
 ANTH 508 Male and Female: Cross-Cultural Perspectives
 ANTH 519 Practical Anthropology
 SOCIO 530 Population: Human Ecology
 ANTH 532-550 Ethnography Courses
 ANTH 604 Culture and Personality
 SOCIO 640 Sociology of the Family

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Geography
 GEOG 500 Geography of the United States 3
One of the following: 3
 GEOG 440 Geography of Natural Resources
 GEOG 450 Geography of Economic Behavior

One 600-level regional geography course or one 700-level systematic geography course (course 710 through 780) 3

9

Economics
 ECON 510 Intermediate Macroeconomics 3
 ECON 520 Intermediate Microeconomics 3
 ECON 530 Money and Banking 3
 ECON 636 Capitalism and Socialism 3

12

Social science comprehensive

The following must be used in conjunction with the teaching fields of economics, geography, history, political science, or sociology.

HIST 599 Senior Seminar 3
 HIST 102 Modern Era 3
 HIST 101 Western Civilization: The Rise of Europe 3
 HIST 251 United States History to 1877 3
 HIST 252 United States History Since 1877 ... 3
 ECON 110 Economics I 3
 GEOG 100 World Regional Geography 3
 POLSC 110 Introduction to Political Science 3
 POLSC 325 U.S. Politics 3
 SOCIO 211 Introduction to Sociology 3
 ANTH 200 Introduction to Cultural Anthropology 3
 HIST History courses (300 or above) 9
 POLSC Political science courses (300 or above) 3
One course in economics or geography or sociology 3
 EDCI 476 Methods of Teaching Social Studies in the Secondary School 2

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Satisfactory completion of this program will qualify a person to be certified to teach American history, world history, economics, geography, political science, and sociology.

Speech
 SPCH 321 Public Speaking II 3
 THTRE 263 Oral Interpretation of Literature ... 3
 SPCH 426 Coaching and Directing Speech Activities 3
 SPCH 325 Argumentation and Debate 3
 THTRE 160 Introduction to Theatre 3

SPCH 322 Interpersonal Communications 3
 or
 SPCH 326 Small Group Discussion 3
 EDC1 476 Methods of Teaching Speech in the
 Secondary School 2
 20

Secondary Education Programs Outside the College of Education

The general education requirements as outlined in an earlier section must be completed by all students expecting to be certified to teach with the exception of students in agriculture. Students in these fields should see their academic advisor for specific requirements.

Those who pursue degrees in certifiable majors in the College of Arts and Sciences are responsible for satisfying all the requirements for teacher education as well as the degree requirements of arts and sciences.

Agricultural education (AED)

Students planning to be agricultural education teachers must complete the approved program in agricultural education. Due to Board of Regents' action, this program is under review. Students should see an agriculture education advisor in the Office of Student and Professional Services, 13 Bluemont Hall.

Professional education requirements*

EDAO 319 Agricultural Education
 Colloquium 2
 EDAF 215 Educational Implications of
 Growth and Development 3
 The following courses must be completed before entry
 into the professional semester:
 EDAF 315 Educational Psychology 3
 EDAF 323 Exceptional Student in the
 Secondary School 2
 EDC1 477 Mid-Level Secondary Reading 2
 EDC1 318 Instructional Media and
 Technology 2
 EDAO 620 Principles and Philosophy of
 Vocational Education 3
 EDAO 621 Program Planning in Vocational
 Education 3

Professional semester (see information earlier for
 specific prerequisites):

EDC1 455 Teaching in a Multicultural
 Society 1
 EDAF 525 Interpersonal Relations in Schools . . 1
 EDAO 500 Methods of Teaching Agriculture . . 2
 EDAO 586 Teaching Participation in the
 Secondary School 8
 AMC 659 Agricultural Mechanic Methods . . . 3
 EDAO 576 Professional Development
 Seminar 2
 38

Music education (MUSED)

Students planning to be music teachers must complete the approved program in music education. These students will be enrolled in the College of Arts and Sciences and receive the degree bachelor of music education. Certification covers grades K-12.

The following course is required for admission to
 teacher education:

DED 102 Teaching as a Career 1

The following course may be taken before
 the student is admitted to teacher education:
 EDAF 215 Educational Implications of Growth
 and Development 3

The application for admission to a teacher education
 program must be filed and approved before a student
 may enroll in any of the following courses which must be
 completed before entry into the professional semester.
 Refer to an earlier section for specific requirements for
 admission to teacher education.

EDC1 318 Instructional Media and
 Technology 2
 MUSIC 511 Music in the Schools K-6 4
 MUSIC 512 Music in the Junior/Senior High
 School 4
 EDAF 315 Educational Psychology 3
 EDAF 323 Exceptional Student in the
 Secondary School 2
 EDAF 410 Foundations of Education 3
 EDAF 525 Interpersonal Relations in the
 School 1
 EDC1 376 Core Teaching Skills and Lab 3
 EDC1 455 Teaching in a Multicultural
 Society 1
 EDC1 477 Middle Level/Secondary Reading . . 2
 MUSIC 670 Advanced Studies in Music
 Education 2

Professional semester (see information earlier for
 specific prerequisites):

EDC1 582 Teaching Participation in
 Music* 12
 40-44

*A full semester of student teaching is required in music
 education.

Physical education (PE)

Students planning to be physical education teachers
 must complete the approved program in physical
 education. These students will be enrolled in the College
 of Arts and Sciences and receive the degree bachelor of
 science.

Physical education core

To be taken by all majors

PE 101 Concepts in Physical Education 1
 PE 206 Professional Orientation 1
 PE 320 Motor Development and Learning . . 3
 PE 325 History and Philosophy of Physical
 Education 3
 PE 330 Kinesiology 3
 PE 335 Physiology of Exercise 3
 PE 340 Social-Psychological Dimensions
 of Physical Activity 3
 PE 561 Adapted Physical Education 3
 PE 710 Measurement and Evaluation
 in Physical Education 3
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Elementary specialization

PE 315 Treatment of Athletic Injuries 3
 PE 359 Administration of Physical
 Education, Athletic, and
 Intramural Programs 3
 PE 376* First Aid and CPR 1
 PE 410 Gymnastics in Physical Education . . 3
 PE 420 Rhythms in Physical Education . . . 3
 PE 445 Movement Exploration and
 Creative Dance for Children 3
 PE 455 Physical Education Activities for
 Elementary Schools 3
 DANCE 120 Modern Dance I 1
 Skill competency** 0-6
 20-26

Secondary specialization

PE 315 Treatment of Athletic Injuries 3
 PE 359 Administration of Physical
 Education, Athletic, and
 Intramural Programs 3
 PE 376* First Aid and CPR 1
 PE 410 Gymnastics in Physical Education . . 3
 PE 415 Team Sports for Secondary
 Schools 3
 PE 420 Rhythms in Physical Education . . . 3

PE 425 Individual and Dual Sports for
 Secondary Schools 3
 DANCE 120 Modern Dance I 1
 or
 DANCE 165 Ballet I 1
 or
 DANCE 171 Jazz Dance 1 1
 Skill competency** 0-6
 20-26

K-12 specialization

PE 315 Treatment of Athletic Injuries 3
 PE 359 Administration of Physical
 Education, Athletic, and
 Intramural Programs 3
 PE 376* First Aid and CPR 1
 PE 410 Gymnastics in Physical Education . . 3
 PE 415 Team Sports for Secondary
 Schools 3
 PE 425 Individual and Dual Sports for
 Secondary Schools 3
 PE 420 Rhythms in Physical Education . . . 3
 PE 445 Movement Exploration and
 Creative Dance for Children 3
 PE 455 Physical Education Activities for
 Elementary Schools 3
 DANCE 120 Modern Dance I 1
 Skill competency** 0-6
 26-32

*Or minimum of current first aid and CPR certification
 at time of petition.

**Competency must be demonstrated in three activities
 in each category below by: satisfactory completion of the
 related lifetime sport class; satisfactory completion of
 the related coaching class; intercollegiate playing
 experience; or varsity high school playing experience.

Category A. Team sports and aquatics: basketball,
 football/baseball/softball, soccer, volleyball, and
 aquatics (WSI or current WSI certification at time of
 petition).

Category B. Individual sports: archery, badminton,
 golf, racquetball/handball, tennis, and wrestling.

Professional education requirements

For those seeking teacher certification
 EDAF 215 Educational Implications of Growth
 and Development 3
 EDAF 315 Educational Psychology 3
 EDAF 410 Foundations of Education 3
 EDAF 525 Interpersonal Relations in the
 School 1
 EDC1 477 Middle Level/Secondary Reading . . 2
 EDAF 323 Exceptional Student in the
 Secondary School 2

Physical education professional semester teaching
 participation (must be done in area of
 specialization) 8-12

EDC1 300 Principles of Elementary
 Education 3
 or
 EDC1 376 Core Teaching Skills and Lab 3
 EDC1 318 Instructional Media and
 Technology 2
 EDC1 455 Teaching in a Multicultural
 Society 1
 EDC1 476 Methods of Teaching in the
 Secondary School 2-3
 and/or
 EDC1 469 Physical Education in Elementary
 Schools 3
 DED 100 Pre-Professional Laboratory
 Experiences (Elementary) 1
 or
 DED 102 Teaching as a Career (Secondary) . . 1
 EDC1 420 Content and Reading Methods
 Lab 1

Early childhood education

Bachelor of science in human development and family studies

Minimum of 125 hours required

Early childhood certification, birth to kindergarten eligibility

Students planning to be certified as early childhood teachers must complete the approved program in early childhood education in the College of Human Ecology, Department of Human Development and Family Studies.

The general education requirements as outlined in an earlier section must be completed. Reference should be made to the section Admission to Teacher Education at the beginning of the College of Education section of this catalog.

Certification Requiring Work Beyond the Bachelor's Degree

The College of Education will recommend for certification individuals satisfying program requirements for the following:

Guidance and counseling

The approved M.S. programs in elementary or secondary guidance and counseling satisfy the state of Kansas certification requirements. Applicants must hold a degree-teaching certificate and have two years of teaching experience, or one year of teaching experience and one year of field experience (may satisfy these requirements concurrently with the program). A minimum of 12 hours in counseling and student personnel program required courses must be earned at KSU. Three of the 12 hours must include the course EDAF 887, Counseling Practicum.

Speech-language pathologist and School Audiologist

The speech pathology-audiology program at KSU meets the requirements for the Certificate of Clinical Competence of the American Speech-Language-Hearing Association, and the Kansas Department of Education requirements for speech-language pathologist and school audiologist. The approved program requires both undergraduate- and graduate-level course work in the speech department of the College of Arts and Sciences resulting in the M.A. degree from the Graduate School. Students interested in the program are encouraged to obtain an advisor in the speech pathology/audiology program, Department of Speech, as early as possible. However, late entry into the program as a junior or senior is possible.

Administrator

A graduate degree is required for any administrative certificate granted by the state of Kansas. The program required by the College of Education must be completed. Eight hours from courses required for the administrator certification must be earned at KSU before the College of Education may recommend administrative certification. The educational administration faculty should be contacted regarding advisement for specific administrative certification.

Special education

Certification in special education is available to those completing programs to serve the gifted, mentally retarded, learning disabled, or emotionally disturbed. Each program is considered as being primarily one that leads to a master's degree. At least half of the credits required for special education certification must be earned at KSU, including at least one major course and one practicum, before the College of Education may recommend for special education certification.

Early childhood handicapped

This endorsement is offered through the cooperative efforts of the Department of Human Development and Family Studies (HDFS) in the College of Human Ecology and the Department of Administration and Foundations (EDAF) in the College of Education. Students are to choose their department affiliation in either HDFS or EDAF and are assigned an advisor in the department chosen.

Reading specialist

Special certification requirements exist for both elementary and secondary school teachers of special reading classes in Kansas. In addition to degree certification and teaching experience, a minimum of 17 semester hours in a planned sequence of graduate reading courses is required for certification. The College of Education offers a variety of courses which meet these requirements.

Library/media specialist

Certification in elementary, secondary, or K-12 school library/media is available in the Department of Curriculum and Instruction. Completion of an approved course of study will certify the teacher for a position entitled librarian or media specialist. The intensive 24- or 26-hour course of study teaches educators to develop, organize, and maintain a school library or media center, and to effectively administer the educational programs offered through a library/media center. In addition, the library/media specialist will be prepared to consult with other educators in the selection and development of primary and supportive curriculum materials. With 5 more graduate hours (three of those in a

multicultural course) students may receive a master's degree.

Supervisor

The supervisor endorsement programs offered in the College of Education provide course work and practical experience for individuals involved in leadership roles in curriculum and instruction. The supervisor endorsement is developed for department heads, directors of curriculum and instruction, supervisors of elementary or secondary instruction, program coordinators, library/media center supervisors or directors, and other educators in leadership positions. A solid background in program planning, curriculum development, staff supervision, and leadership practice for educators is provided through a combination of courses and internships. The Department of Curriculum and Instruction works closely with other University departments and disciplines in developing individual programs of study for educators. Certification recommendation is initiated through the Office of Certification, 13 Bluemont Hall.

Graduate Study

The College of Education offers work leading to the master of science degree, the doctor of philosophy in education degree, and the doctor of education degree. Admission to the Graduate School is required of all students enrolling for graduate credit. The general requirements for advanced degrees are set forth in the Graduate School section of this catalog.

The college offers numerous off-campus courses throughout the state for people who cannot attend classes on campus. Credit toward a graduate degree may be earned off campus. Doctoral candidates must meet specific on-campus residency requirements.

General admission requirements

Candidates for graduate work shall meet the following admission requirements:

Graduation from an accredited institution whose requirements for the bachelor's degree are substantially equivalent to those of Kansas State University.

Undergraduate grade average of 3.0 or better in the junior and senior years.

Undergraduate preparation substantially equivalent to that given by KSU in the specific field in which the applicant expects to do graduate work.

Undergraduate preparation in closely related or supporting subjects adequate to support advanced work in the field of the applicant's choice.

Students lacking preparation in certain areas may be required to do additional work.

International students whose native language is not English must make available the results of the Test of English as a Foreign Language (TOEFL). A minimum score of 550 is required on this examination.

Master of science degree

Major work leading to the degree master of science is offered in adult/occupational and continuing education; educational administration; student counseling and personnel services; secondary education; elementary education; and special education.

All students expecting to work for master's degrees shall make available to the Office of Graduate Studies, College of Education, two copies of the graduate school application, two official transcripts from each institution attended, and a statement of academic objectives for graduate study. International students must make available three letters of recommendation. Advisors and/or departments may require additional information.

M.S. degree requirements

A minimum of 30 semester hours, approximately one-half of which shall be in the major field.

Academic advisors should be consulted regarding specific departmental program requirements.

Departments shall have the option of using one or more of three plans: (1) a thesis of 6 to 8 semester hours; (2) a written report of 2 semester hours either of research or of problem work on a topic in the major field; or (3) course work only, but including evidence of scholarly effort, such as term papers, production of art, music, designs, as determined by the student's supervisory committee.

A final oral examination and/or a comprehensive written examination shall be required of the student. These may include a defense of the thesis or report, an interpretation of other scholarly products, or a testing of the student's understanding of the fields of study. Choice of examination procedures shall be a departmental option.

Information on special requirements for an advanced degree may be obtained by writing to the department head.

Doctor of philosophy degree in education

Major work is available in the following specializations: adult and continuing education; student counseling and personnel services; and curriculum and instruction. Joint programs involving selected departments in other colleges at KSU will prepare individuals for teaching positions in community and four-year colleges.

Admission requirements

In addition to the general admission requirements, applicants to the Ph.D. program in education shall provide to the Office of Graduate Studies, College of Education, two copies of the graduate school application, two official transcripts for undergraduate and graduate courses, an official record of a score at least at the national mean for education students on the Miller Analogies Test or the verbal and quantitative sections of the Graduate Record Examination, a statement of objectives indicating educational experience and professional goals showing a commitment to a career with responsibilities congruent with those associated with college faculty membership, and three letters of recommendation from higher education faculty members.

Basic program requirements

Basic requirements for the Ph.D. in education include:

A minimum of 90 semester hours beyond the baccalaureate degree.

A minimum of one year of full-time, on-campus study, normally indicated by at least 24 semester course hours within 12 calendar months including two consecutive full-time academic semesters.

A minimum of 9 graduate-level semester hours of course work in research methods and interpretation, in experimental design, and in quantitative analysis, with additional or alternate methodological course work appropriate to advancing the discipline's scholarship through a quality dissertation.

Evidence of supervised experience during the program which socializes the candidate to the teaching and scholarship responsibilities and expectations of the university community.

Satisfactory completion of all segments of a monitored, written examination of at least 12 hours over all major and minor areas specified on the program of study.

A minimum of 30 semester hours of supervised dissertation research.

Completion of a dissertation which examines a topic congruent with the program of study and which promises to advance or confirm important theoretical premises of the profession using a systematic methodology consistent with accepted research paradigms; the dissertation must be successfully defended in a public, oral defense.

Beyond the courses specified in the research core, each student's program of study is individualized with the approval of the major professor and the supervisory committee to optimize the student's interests, expertise, and professional goals.

The program is directed by a minimum of five members of the University graduate faculty, including a major professor with substantial expertise in the area of emphasis and at least two faculty outside the student's specialization, one appointed by the dean of the Graduate School and serving as the chair of the examination committee.

Information on special requirements for the Ph.D. degree may be obtained by writing to the relevant department head.

Doctor of education degree

Major work is available in the following specializations: adult and continuing education, educational administration, special education, curriculum and instruction, educational psychology, and student counseling and personnel services. These programs are intended to develop leaders in the resolution of problems of professional practice.

Admission requirements

In addition to the general admission requirements, applicants to the Ed.D. program shall provide to the Office of Graduate Studies, College of Education, two copies of the graduate school application, two official transcripts for undergraduate and graduate courses, an official record of a score at least at the national mean for education students on the Miller Analogies Test or the verbal and quantitative sections of the Graduate Record Examination, a statement of objectives indicating educational experience and goals showing a commitment to a career in leadership positions in professional practice, and three letters of reference verifying at least two years of successful, relevant professional experience.

Basic program requirements

Basic requirements for the Ed.D. include:

A minimum of 94 semester hours beyond the baccalaureate degree.

An academic residency indicated by the completion of one of the following options: (1) four summers within a five-year period in which 27 semester hours of course work are completed; (2) three summers within a four-year period in which 24 semester hours of course work are completed, with a minimum of 6 semester hours of additional course work completed in one intervening semester; (3) 24 semester hours of course work completed within 12 calendar months.

A supervised clinical experience of 12 semester hours is required.

A supervised internship of at least 3 semester hours.

A minimum of 9 semester hours of course work in research methodology consistent with that required for the dissertation, to include the course EDAF 816.

A foundation core of 12 semester hours, to include specified courses in the techniques and interpretation of educational research, in the historical and philosophical analysis of educational practice, in social science explanations of educating a diverse society, and in the psychological bases of educational thought and practice.

Completion of a major area of emphasis which includes at least 54 semester hours.

Satisfactory completion of all segments of a monitored, written examination of at least 12 hours, three of which must be over the foundations core.

A minimum of 16 semester hours of supervised dissertation research.

Completion of a dissertation which treats an important topic of professional education practice using a systematic methodology consistent with accepted research paradigms; the dissertation must be successfully defended in a public, oral defense.

The program is directed by a minimum of five members of the University graduate faculty, including a major professor with substantial expertise in the area of emphasis, two other faculty with strengths in the area of emphasis, one faculty member from outside the student's specialization, and one faculty member, appointed by the dean of the Graduate School, from another department within the College of Education who serves as the chair of the examination committee.

Information on special requirements for the Ed.D. may be obtained by writing to the relevant department head.

Doctoral degree offerings

Adult and continuing education (Ed.D. and Ph.D.)

Special education (Ed.D.)

Educational psychology (Ed.D.)

Student counseling and personnel services (Ed.D. and Ph.D.)

Educational administration (Ed.D.)

Curriculum and instruction (Ed.D. and Ph.D.)

General Courses

General courses in education

DED 010. Introduction to the Honors Program. (0) I, II. Direction and goals for the honors program in the College of Education. Meets twice during the semester. Pr.: Nine hours of college work completed. DED-010-0-0801

DED 020. Honors Program. (0) I, II. All students accepted into the College of Education honors program must enroll each semester. Pr.: Sophomore or higher standing, 3.5 cumulative grade point average, acceptance into the honors program. DED-020-0-0801

DED 100. Pre-Professional Laboratory Experiences. (1) I, II. Supervised experiences in education designed to facilitate orientation and investigation of teaching through the teacher aide program. Maximum credit of

3 hours. No more than 1 credit per semester. DED-100-2-0808

DED 102. Teaching as a Career. (1) I, II. Introduction to teaching as a career and to teacher preparation. Includes visits to and teacher aiding in public school classrooms with emphasis on the teacher's role. For lower-division students not yet admitted to teacher education. DED-102-2-0801

DED 105. Introduction to Women's Studies. (3)

DED 315. Introduction to Gerontology. (3) II. A multidisciplinary introduction to the field of aging. Examines social, psychological, developmental, organizational, and economic aspects of aging. Theoretical, methodological, and applied issues of aging will be related to contemporary American society. Same as DAS 315; also offered through the Colleges of Agriculture, Architecture and Design, and Human Ecology. DED-315-0-4900

DED 320. Honors Seminar. (1) I, II. Selected topics in education. May be taken more than once for credit. For students in honors program only. DED-320-0-0801

DED 405. Senior Seminar in Women's Studies. (3)

DED 415. Senior Seminar in Gerontology. (3) I. Integration of course work in gerontology with an in-depth project in a special interest area. Pr.: Completion of 15 hours of course work in gerontology second major. Same as DAS 315; also offered through the Colleges of Agriculture, Architecture and Design, and Human Ecology. DED-415-0-4900

DED 420. Honors Research. (1-3) I, II. Individual research projects under the supervision of a professor in the College of Education. For students in honors program only. Pr.: A minimum of 2 hours credit in DED 320 or 1 hour credit in DED 320 and 1 hour selected from GENAG 310, DAS 399, GNHE 399. DED-420-4-0801

DED 506. Contemporary Feminist Frameworks. (3) I. Surveys major contemporary U.S. theories of gender and their development, including impact of feminist movement on the development of theory, interactions of race and gender, women's culture, and men's roles. Compares approaches of social sciences and humanities. Pr.: Six semester hours Women's Studies. DED-506-0-4903

Administration and Foundations

The focus of the department is twofold: to provide the foundations of education at the undergraduate level in special education and educational sociology and psychology; and to offer graduate studies in educational administration, guidance and counseling, educational psychology, special education, and higher education.

Counselor Education and Educational Psychology

Stephen L. Benton*

Professors Bradley,* Hanna,* Holen,* D. Hoyt,* K. Hoyt,* Neely,* Newhouse,* Parish,* and Sinnett;* Associate Professors Benton, Dettmer,* Lynch,* Newton,* and Steffen;* Assistant Professors Dannells,* Rowlett, and Scott; Emeritus: Professor Danskin; Associate Professor Kaiser.*

Graduate studies in counseling and student personnel services emphasize behavioral sciences, therapeutic intervention into the lives of humans, the organization and

administration of helping services, and research.

The study of educational psychology at the graduate level focuses on applications of the behavioral sciences to the educational process. Emphasis is on human growth and development, learning theory, statistics and measurement, and their impact in educational settings. Students in this area typically provide leadership at all levels of education.

Educational Administration

Charles E. Litz*

Professors Bailey,* Litz,* Shoop,* Stewart,* and Wilson;* Assistant Professors Pankake,* Thompson,* and Wicks.

The graduate program in educational administration stresses both breadth and depth of content to provide the student ample opportunity to develop an understanding of leadership in educational organization and competencies in behavioral and managerial sciences, educational planning, educational law, educational finance, and research including overarching theoretical frameworks.

The foundations of education include such topics as community education and history and philosophy of education. The intent is to bring to bear upon the problems of contemporary education the contributions of the humanities and the behavioral sciences at the graduate level.

Special Education

Warren J. White*

Professor R. Zabel;* Associate Professors Dettmer,* Dyck,* White,* and M. K. Zabel; Assistant Professor Thurston; Emeritus: Professor DeMand;* Associate Professor Ohlsen.*

Studies in special education accommodate students who wish to specialize in teaching children and youth with certain exceptionalities. Students must complete an undergraduate teacher education program leading to certification for either elementary or secondary school teaching. Program focus is to work with the mentally retarded, learning disabled, gifted, and the behavior disordered student at the preschool, elementary, and secondary levels.

Courses in administration and foundations

Undergraduate credit

EDAF 111. Group Life Seminar. (1) I, II. Introduction to organized group experience through participation in weekly small group meetings. Study of such questions as effective communication, the function of groups, and human growth through social interaction. Open to selected freshmen and other new students, with consent of instructor. EDAF-111-1-0801

EDAF 211. Leadership Training Seminar. (2) I, II. General principles of leadership as applied to small groups. Study of the role of the leader, group processes and interaction, defining group goals, and techniques of observation. Workshop and supervision in small group leadership. Pr.: Sophomore standing and consent of instructor. EDAF-211-1-0801

EDAF 215. Educational Implications of Growth and Development. (3) I, II, S. Physical, intellectual, emotional, social, and personality development from conception to adulthood; understanding of these phases of development and their importance for education essential as background for those desiring to enter the teaching profession. EDAF-215-0-0822

EDAF 311. Interaction and Guidance for the Paraprofessional. (3) I, II. Application of a systematic approach to interaction skills in a paraprofessional helping relationship. Includes background knowledge of listening skills and practice in emitting skills which influence interaction quality. Pr.: Junior standing. EDAF-311-0-0826

EDAF 315. Educational Psychology. (3) I, II, S. The application of psychological principles to the teaching-learning process with special emphasis on principles of learning, motivation, information processing, individual difference, and measurement. Pr.: Admission to teacher education, and EDAF 215. Secondary education students must take this course simultaneously with EDAF 323 and EDCI 376. EDAF-315-0-0822

EDAF 323. Exceptional Student in the Secondary School. (2) I, II, S. Designed for regular classroom teachers in meeting the needs of exceptional adolescents. Support strategies for teachers and exceptional students in the mainstream of education. Pr.: Admission to teacher education, and EDAF 215. Must be taken simultaneously with EDAF 315 and EDCI 376. EDAF-323-0-0808

EDAF 410. Foundations of Education. (3) I, II, S. For prospective teachers. The philosophical, historical, sociological, and political influences on education as they relate to and explain contemporary issues in education in the United States. Pr.: Junior standing and admission to teacher education. EDAF-410-0-0821

Undergraduate and graduate credit in minor field

EDAF 511. Independent Study in Education. (1-3) I, II, S. Selected topics in professional education. Maximum of three hours applicable toward degree requirements. Pr.: Consent of department head. EDAF-511-3-0801

EDAF 525. Interpersonal Relations in the Schools. (1) I, II. A didactic and experiential course designed to develop an understanding of human relations skills in the schools. Provides knowledge and skills necessary to work effectively with students, parents, and school personnel. Particular emphasis is on the basis for interpersonal relations in education, communication skills, the facilitative relationship, working with students in groups, and conducting meetings with parents and school personnel. Pr.: EDCI 420, 477, and either EDCI 476, EDAO 500, or 550. Simultaneous enrollment required for EDCI 455, EDAF 525, and either EDCI 586 or EDAO 586. EDAF-525-0-0826

Undergraduate and graduate credit

EDAF 611. Educational Sociology. (3) I, II, S. A study to gain an understanding of the ways in which the school can effectively use the social process in developing and educating the individual and to show the interrelationships of such institutions as the family, the church, the playgrounds, and the various youth-serving agencies with the school. Pr.: Senior standing. EDAF-611-0-0801

EDAF 711. Middle School Classroom Guidance. (3) On sufficient demand. Techniques of integrating guidance principles for pre- and early teens into a middle school concept; investigation of classroom dynamics for middle school teachers as members of the guidance team; involvement of teachers in model guidance programs. Pr.: EDAF 315. EDAF-711-0-0826

EDAF 715. Principles of Measurement. (3) I, II, S. Principles of constructing, administering, and evaluating tests and other measures used in schools. Focus on norm- and criterion-reference uses of teacher-made and standardized measures as an integral part of teaching. Pr.: EDAF 315. EDAF-715-1-0825

EDAF 721. Mental Hygiene in the School and Community. (3) On sufficient demand. Dynamics creating different personalities and deviant behavior. The educative process as it affects personality integrity. Pr.: PSYCH 280 or EDAF 215. EDAF-721-0-0808

EDAF 722. Psychology of Exceptional Children. (3) I, II, S. Psychological aspects of the superior, the subnormal, the emotionally disturbed, and the physically handicapped child, with attention to early identification and treatment. Pr.: PSYCH 280 or EDAF 215. EDAF-722-1-0808

EDAF 723. The Exceptional Child in the Regular Classroom. (3) I, II. Designed for regular classroom teachers in meeting the needs of exceptional children. Support strategies for teachers and exceptional children in the mainstream of education will be explored. Pr.: EDAF 215. EDAF-723-9-0808

EDAF 728. Characteristics of the Emotionally Disturbed. (3) I, II. A survey and exploration of approaches to the educational needs of the socially and emotionally disturbed child. Development of curricula and learning environment will be emphasized. Pr.: EDAF 722 or 763 and/or consent of instructor. EDAF-728-1-0816

EDAF 731. Characteristics of Learning Disabilities. (3) I, II. An explanation of important concepts and practices in the area of learning disabilities. Emphasis will be placed upon diagnosis of underlying causes and their characteristics. Pr.: EDAF 722 or 763. EDAF-731-0-0818

EDAF 732. Remediation Education for the Emotionally Disturbed. (3) On sufficient demand. Educational planning, instructional methods, behavioral management, curricula modification, and use of appropriate media and materials with the emotionally disturbed. Pr.: EDAF 315. EDAF-732-0-0808

EDAF 733. Remediation of Learning Disabilities. (3) On sufficient demand. Educational planning, instructional methods, behavioral management, curricula modifications, and use of appropriate media and materials with the learning disabled. Pr.: EDAF 731. EDAF-733-0-0808

EDAF 750. Introduction to Education of the Gifted. (3) On sufficient demand. An overview of historical perspectives related to gifted child education, various facets of intellectual and creative functioning, national and state guidelines for planning and implementing gifted programs, modifying curriculum and classroom strategies to nurture gifted potential, current issues in gifted education. Pr.: EDAF 622 or 623. EDAF-750-0-0811

EDAF 753. Curriculum Development for the Mentally Retarded. (3) On sufficient demand. Curriculum content, methods, and organization of work in the education of mentally retarded children using experience units. Pr.: EDAF 763. EDAF-753-1-0810

EDAF 755. Guidance of the Exceptional Individual. (3) On sufficient demand. Strategies for teachers in working with the academic, vocational, personal, and social adjustment of the exceptional individual. The course will focus on the individual in preschool, elementary, secondary, postsecondary, and adult settings. Pr.: EDAF 722 or 763. EDAF-755-0-0802

EDAF 763. Education of Exceptional Children. (3) I, II. A general study of special education, with emphasis on the development and organization of instructional materials; parent education; and coordination of the services of physicians, health departments, welfare agencies, and the school. Included is the study of administration of special services at the national, state, and local levels. Pr.: EDAF 215 and EDCI 300 or 451. EDAF-763-1-0808

EDAF 764. Mental Retardation. (3) On sufficient demand. Etiological, psychological, sociological, and educational aspects of mental retardation. Pr.: EDAF 763. EDAF-764-0-0808

EDAF 775. Readings in Education. (1-3) I, II, S. Readings in research and application in specialized areas in education. May be taken more than once. Pr.: EDAF 215. See EDAO 775 and EDCI 775. EDAF-775-3-0801

EDAF 785. Practicum in Education of Exceptional Children. (3-6) On sufficient demand. Observation and participation in teaching exceptional children under the supervision of selected teachers in special education programs. Pr.: Admission to student teaching and senior standing. EDAF-785-2-0808

EDAF 786. Topics in Education. (1-3) I, II, S. Examination of current topic in specialization of faculty. Varied topics offered each semester so course may be repeated. Pr.: EDAF 215. See EDAO 786 or EDCI 786. EDAF-786-3-0801

EDAF 787. Field Experiences in Special Education. (1-3) On sufficient demand. Observation and supervised activities in schools, camps, clinics, or institutions related to student's area of special interest or preparation. Pr.: EDAF 722 or 763. EDAF-787-2-0808

EDAF 795. Problems in Administration and Foundations. Credit arranged. I, II, S. Selected students are permitted to secure specialized training appropriate to the needs of the individual. The student's project may involve intensive library investigation in a special field or the collection and analysis of data pertinent to a given problem. All work is done independently under the direction of a faculty member. As many conferences are held as necessary to assure successful completion of a project. Pr.: Background of courses necessary for the problem undertaken and consent of instructor. EDAF-795-3-0801

Graduate credit

EDAF 802. Stress Management for Teachers, Counselors, and Administrators. (3) On sufficient demand. Systematic training in stress-management strategies and techniques for the professional educator and for use in classroom and counseling settings. Includes knowledge of self-directed and instrumental techniques, psychophysiology of stress, issues in stress management, and role of teacher and counselor in delivering stress-management training. Pr.: EDAF 315. EDAF-802-1-5-0826

EDAF 804. Survey Techniques and Questionnaire Construction. (3) I. Principles of survey research including instrument design, sample selection, assessment of instruments and samples, and interpreting results. Pr.: Senior standing and EDAF 315. EDAF-804-1-0824

EDAF 810. The Impact of College on Students. (3) II. Study of institutional practices and policies and their impact on college students. Special attention will be given to the environmental, sociological, and psychological influences on the personal and educational maturity of students. Pr.: EDAF 715. EDAF-810-0-0826

EDAF 811. Philosophy of Education. (3) I, II, S. A critical analysis of major educational philosophies with discussion of their impact on the problem of education for democracy. Pr.: Twelve hours of education and consent of instructor. EDAF-811-0-0826

EDAF 812. History and Philosophy of Higher Education. (3) I, S. History and development of higher education with a study of the philosophy, objectives, and functions of various types of institutions. Pr.: Consent of instructor. EDAF-812-0-0821

EDAF 813. History of American Education. (3) II. Historical study of the educational endeavor in the United States with special attention to problems that have relevance to contemporary education. Readings, discussion, presentations by instruction leader and students. Pr.: EDAF 611 or consent of instructor. EDAF-813-0-0801

EDAF 815. Individual Appraisal. (3) II. Intensive study of standardized tests and their use. Emphasis given to values and problems of testing, selection and evaluation of measuring instruments, testing programs, and interpretation of test results. Pr.: EDAF 720 and 715. EDAF-815-1-0825

EDAF 816. Research Methods and Treatment of Data. (3) I, II, S. Principles of research in education; nature, organization, and presentation of research data; basic statistical computations and interpretations; selection of research problems. Pr.: Nine hours of education or consent of instructor. EDAF-816-1-0824

EDAF 817. Statistical Methods in Education. (3) I, II, S. An introductory yet comprehensive survey of common statistical analyses encountered in educational research. Computer oriented. Pr.: A first course in college mathematics plus either STAT 703 or EDAF 816. EDAF-817-1-0824

EDAF 818. General School Administration. (3) II, S. A panoramic view of the problems and tasks of school-system administration centered on the administrative process and substantive problems of leadership, personnel, business and finance, curriculum, facilities, and school-community relations. Pr.: One year of teaching experience. EDAF-818-1-0827

EDAF 819. Educational Finance. (3) II, S. An examination of issues relating to the financing of education, including local, state, and federal fiscal support, tax structures, distributional formulas, school finance reform strategies, and budget preparation and administration. Pr.: EDAF 818. EDAF-819-1-0827

EDAF 820. Individual Intelligence Testing. (3-5) On sufficient demand. Appraisal of individual intelligence with emphasis on techniques of administration, scoring, interpreting, and applying in school settings. Supervised practice in the use of WISC-R and other tests such as the Stanford-Binet, K-ABC, and WAIS-R. Pr.: EDAF 715 and consent of instructor. EDAF-820-1-0825

EDAF 822. Principles and Practices of Guidance. (3) S. Need and nature of guidance functions; personnel, their duties and relations; programs and evaluation of results. Pr.: EDCI 585 or 586 or consent of instructor. EDAF-822-1-0826

EDAF 823. Counseling Theory. (3) I, S. Theories, methods, and problems in counseling, relating the counseling process to dynamics of human behavior. Pr.: EDAF 886 or PSYCH 520 or equiv. and conc. enrollment. EDAF-823-1-0826

EDAF 825. Social Psychology of Education. (3) II. Consideration of the literature and applications of social/psychological studies of the student, student cultures, characteristics of educational institutions, and organizational change. Pr.: EDAF 611 or 812 or consent of instructor. EDAF-825-0-0821

EDAF 827. Foundations of Community Education. (3) II, alternate S. A study of the relationship between the school and the community, with special emphasis on the development of a comprehensive community education program. Organizational patterns, financing, program development, and interaction with other community agencies are analyzed. Pr.: EDAF 818 or 611. EDAF-827-0-0827

EDAF 829. Learning Principles for Effective Teaching. (3) S and on sufficient demand. Exploration of learning theories with emphasis on the application of psychological principles to the teaching-learning process, as a basis for examining and understanding contemporary research in teaching effectiveness. Pr.: EDAF 315. EDAF-829-0-0822

EDAF 830. Educational Facility Planning. (3) S. Examination of issues relating to the provision of educational building and other facility needs, including planning, financing, construction, maintenance, and utilization. Pr.: EDAF 818. EDAF-830-1-0827

EDAF 831. Educational Law. (3) I, S. An examination of the legal status of educational institutions in the United States; the legal rights and responsibilities of educators including due process, tort liability, and contracts; student rights; landmark court decisions; federal and state legislation impacting on education, and resources available to assist in developing solutions to legal problems. Pr.: EDAF 818. EDAF-831-0-0827

EDAF 832. The Community/Junior College. (3) I. This course is designed to give the student an overview of community/junior colleges. Emphasis on philosophy, purposes, curriculum, organization, professional staff, student-personnel programs, and the role of the comprehensive community junior college in higher education. Pr.: EDAF 315. EDAF-832-1-0806

EDAF 833. Administration of Special Education Programs. (2-3) On sufficient demand. The study of administrative units for special education, placement procedures, federal and state legislation, and program reimbursement and funding. Pr.: EDAF 818 or 811. EDAF-833-2-0808

EDAF 834. Strategies for Educational Change. (3) I, S. This course provides educators with conceptual knowledge concerning the problems and processes of educational change. Case studies of change are analyzed in the attempt to develop models of educational change. Pr.: EDAF 818 or EDCI 857 or 831. EDAF-834-0-0827

EDAF 835. The Principalship. (3) I, alternate S. Analysis of the principal's role as he or she interacts with various referent groups. Applicable to both elementary and secondary administration. Pr.: One year of teaching experience. EDAF-835-1-0827

EDAF 836. School-Public Relations. (2-3) I, S. Interrelationships that exist between the school and the community and the role of the teacher and administrator in such relationships. Pr.: EDAF 818 for graduate students in educational administration. One year of teaching experience for all others. EDAF-836-1-0827

EDAF 841. Educational Program Management and Evaluation. (3) II, S. An examination of program management techniques as well as formative evaluation strategies used in educational project and program administration. Pr.: EDAF 818. EDAF-841-0-0827

EDAF 845. Special Education Programming: Parental Involvement. (3) S. An in-depth consideration of the role of home and parents in the educational programming for school-age exceptional children. Emphasis on practical and positive strategies used in working with parents. Pr.: EDAF 722. EDAF-845-0-0808

EDAF 847. Curriculum for the Gifted. (3) On sufficient demand. Theories and strategies for differentiating the curriculum for gifted students, emphasis on appropriate methods and materials. Pr.: EDAF 846. EDAF-847-0-0811

EDAF 850. The Consulting Process in Special Education. (3) S. A course to prepare special education teachers with skills for consulting effectively with classroom teachers, related services personnel, administrators, and parents about curriculum and program alternatives for exceptional children. Emphasis is upon developing collaborative consultation processes through communication, cooperation and coordination techniques. Pr.: EDAF 622 or 623. EDAF-350-0-0808

EDAF 852. Educational and Career Development Information. (3) I, S. A study of the competencies, skills, and demands necessary for individual growth in various careers, with attention to the collection, evaluation, dissemination, and use of career development information in school and community settings by counselors. Particular emphasis will be given to career life planning. Pr.: Senior or graduate standing. EDAF-852-0-0801

EDAF 855. Administrative Leadership in Curriculum. (3) This course identifies the major roles and responsibilities of school administrators in curriculum-related activities. Administrative skills necessary for developing and evaluating the curriculum will be examined. Pr.: EDAF 818. EDAF-855-0-0828

EDAF 856. Guidance in the Elementary School. (3) II. The nature and philosophy of guidance in the elementary school; the function of specialized child appraisal and counseling techniques in the unique interrelationships of the specialist and the teacher in the team approach to elementary school guidance. Pr.: EDCI 585, EDAF 720, and consent of instructor. EDAF-856-0-0826

EDAF 857. Organization and Administration of the Guidance Services Program. (3) I. Staff, facilities, tools, and techniques of the school and community in an organized guidance program. Pr.: Twelve semester hours in courses required to meet standard counselor qualifications; consent of instructor. EDAF-857-0-0826

EDAF 858. Group Guidance. (3) I, S. Designed to acquaint students with group procedures as basic tools in counseling, guidance, and other education services. Pr.: EDAF 823 or PSYCH 550. EDAF-858-1-0826

EDAF 859. Principles of Student Personnel Administration. (3) I. Principles, administrative organization, procedures, and problems of student personnel work in higher education; analysis of policy formulation, staff relationships, finance and controls, and physical plant needs; an introduction to the personnel services of: health, housing, food, student activities, placement, and counseling services. Pr.: Graduate standing and consent of instructor. EDAF-859-1-0826

EDAF 860. Adult Counseling. (3) I. Study of adults and the problems they face in their educational, psychological, social, and career development. Particular emphasis will be given to counseling theories and strategies important for counselors working with adults experiencing these developmental problems. Pr.: EDAF 823 or conc. enrollment. EDAF-860-0-0807

EDAF 861. Organization of Counseling Services for Adults. (3) On sufficient demand. Strategies for the development and implementation of counseling services for adults in school, community, business, and industrial settings. The course will focus on the integration of formal and informal educational, career development, and mental health programs developed for adults having life adjustment problems. Local, state, and federal programs and agencies and their role in adult counseling services will be examined. Pr.: EDAF 860. EDAF-861-0-0807

EDAF 862. Leisure Counseling. (3) On sufficient demand. Course develops leisure counseling models for use in community and institutional recreational programs and to provide skills and competencies in assessing, interviewing, and counseling individuals and groups in the use of leisure experiences. Pr.: REC 725 and/or EDAF 858. Same as REC 862. EDAF-862-0-0826

EDAF 863. Vocational Psychology. (3) On sufficient demand. Environment and human factors in occupational adjustment; appraisal of vocational fitness. Pr.: Consent of instructor. EDAF-863-0-0839

EDAF 865. Administrative Leadership in Staff Development. (3) I, II, S. This course focuses on the role of the administrator in developing, implementing, and evaluating staff development programs. Superintendent, building-level administrator, and staff development director leadership skills will be analyzed. Pr.: EDAF 818. EDAF-865-0-0827

EDAF 871. Consultation for Counselors. (3) II. This course acquaints students with the major models of consultation that may be used by counselors for intervention with individuals and organizations. Techniques, issues, and ethical considerations are also addressed. Pr.: EDAF 823 and 858. EDAF-871-0-0826

EDAF 875. Administrative Leadership in Staff Supervision. (3) This course identifies the major roles and responsibilities of superintendents and building-level administrators as supervisors of staff in a K-12 school district. EDAF-875-0-0828

EDAF 885. Practicum in Student Personnel Work. (3) I, II. Supervised professional experience in the various agencies that comprise a total program of student personnel services within a postsecondary, college, or university setting. Pr.: EDAF 859 and consent of instructor. EDAF-885-2-0826

EDAF 886. Counseling Techniques and Practice. (3) I, II, S. A prepracticum in counseling and interviewing—building facilitative relationships, case conceptualization, appropriate counseling strategy choice, and evaluating termination. A consideration of ethics and unique features in selected cases will be discussed. Pr.: EDAF 823 or conc. enrollment. EDAF-886-1-2-0826

EDAF 887. Practicum in Counseling. (3) I, II. Supervised practical experience in counseling. Pr.: EDAF 823 and consent of instructor. Same as PSYCH 860. EDAF-887-2-0826

EDAF 888. Seminar in Student Personnel Work. (1-4) On sufficient demand. Intensive discussion of a problem of current professional interest based on study of pertinent original literature. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. EDAF-888-0-0826

EDAF 889. Practicum in School Administration. (3-6) I, II, S. Supervised on-the-job experience in school administration. Pr.: Consent of instructor. EDAF-889-2-0827

EDAF 890-894. Seminars in Administration and Foundations (Var.) On sufficient demand. These seminars will consider research in the several fields of education represented in terms of the special interests of the students. Pr.: Consent of instructor.

EDAF 890. Educational Administration. EDAF-890-0-0827

EDAF 891. Social Foundations. EDAF-891-0-0821

EDAF 892. Guidance Services. EDAF-892-0826

EDAF 893. Special Education. EDAF-893-0808

EDAF 894. Community Education. EDAF-894-0-0807

EDAF 898. Master's Report. (Var.) I, II, S. Pr.: Consent of instructor. EDAF-898-3-0801

EDAF 899. Master's Research. (Var.) I, II, S. Pr.: Consent of instructor. EDAF-899-4-0827

EDAF 910. Educational Personnel Administration. (3) II, S. Personnel practices in education are considered along with the implications of collective negotiations and professional accountability for personnel policies. Pr.: EDAF 818. EDAF-910-0-0805

EDAF 912. Psychological Bases of Educational Thought and Practice. (3) I, S. In studying educational applications of behavioristic and cognitive learning theories, attention is given to historical milieus of origin, relationships to major educational philosophies, relationships to features of instruction, and evaluation of impact on contemporary educational thought and practice. Pr.: EDAF 315 or EDAO 790 and either EDAF 410, 611, 811, 812, or 813. EDAF 912-0-0822

EDAF 915. Theory of Measurement. (3) On sufficient demand. A course designed to provide the theoretical background needed for students who wish to (1) develop greater competence in practical uses of tests in educational settings, (2) pursue academic study of measurement theory, and (3) develop instruments for research use. Pr.: EDAF 715. EDAF-915-1-0825

EDAF 917. Experimental Design in Educational Research. (3) II, S. Philosophy, planning, and evaluation of research in education. Experimental designs appropriate for educational research with special emphasis on multivariable procedures. Computer oriented. Pr.: EDAF 817. EDAF-917-1-0824

EDAF 920. Advanced Educational Psychology: Learning. (3) I, on sufficient demand. The learning process, with special emphasis on human abilities and early and contemporary learning theories, with applications to selected recent developments in teaching and persistent problems and issues in education. Pr.: EDAF 315 or its equiv. EDAF-920-1-0822

EDAF 921. Advanced Educational Psychology: Development. (3) On sufficient demand. Advanced studies in physical, intellectual, emotional, social, and personality development with the focus on the importance of these factors to the educational process. Pr.: EDAF 315. EDAF-921-1-0822

EDAF 924. Systems and Theories of Vocational Counseling. (3) On sufficient demand. A historical and contemporary analysis of systems and theories of vocational psychology and their implications for use in the counseling setting. Pr.: EDAF 752 and 823. EDAF-924-0-0839

EDAF 926. Theory in Educational Administration. (3) II. Organizational and administrative theory as applied to the school and the functions of the school administrator. The process of theory development in educational administration is also considered. Pr.: EDAF 818. EDAF-926-0-0827

EDAF 927. Higher Education Administration. (3) II. Administration theory applied to the organization and administration of colleges and universities; special reference to structure, governing boards, administrative roles, decision making, and analysis of selected problems. Pr.: EDAF 812. EDAF-927-1-0827

EDAF 928. Educational Governance. (3) S. An analysis of educational decision making at the local, state, and national levels. The internal decision making practices of professional educational organizations are also considered. Pr.: EDAF 818 and 6 additional hours in educational administration. EDAF-928-0-0801

EDAF 958. Advanced Group Counseling. (3) II. The examination of selected group counseling theories and their relevance for the practice of group counseling in a variety of settings. Pr.: EDAF 858. EDAF-958-0-0826

EDAF 959. Practicum in Group Counseling. (3) On sufficient demand. Supervised group counseling experience in a variety of settings. Pr.: EDAF 858 and 958. EDAF-959-2-0826

EDAF 985. Advanced Counseling Theory. (3) I. Reading and discussion of primary works of major counseling theories; advanced theoretical issues in counseling. Pr.: EDAF 823 and 887. EDAF-985-0-0826

EDAF 986. Advanced Counseling Practices. (3) I, II. Intense supervised practice in counseling. Particular emphasis will be given to the development of skills for intervention into human problems and time-limited case management. Pr.: EDAF 823 and 887. EDAF-986-2-0826

EDAF 987. Counseling Supervision Practicum. (3) On sufficient demand. An advanced course in the theory, techniques, and problems of supervising persons being trained as counselors. Course emphasis is on actual supervisory experiences with beginning counselors. Open to advanced doctoral students only with consent of instructor. EDAF-987-2-0826

EDAF 989. Internship in EDAF. (Var.) On sufficient demand. Studies of and field experiences in the development of programs in cooperating schools and educational or related agencies under the supervision of College of Education graduate faculty members. A maximum of 6 credit hours may be chosen from the areas listed. Pr.: Consent of instructor. EDAF-989-2-0827

EDAF 988. Special Education. (Var.) On sufficient demand. Studies of and field experiences in the development of programs in cooperating schools and educational or related agencies under the supervision of College of Education graduate faculty members. A maximum of 6 credit hours may be chosen. Pr.: Consent of instructor. EDAF-988-2-0808

EDAF 990. Student Personnel Services. EDAF-990-2-0826

EDAF 990. Advanced Seminars in Administration and Foundations. (2-3) On sufficient demand. These seminars will critically consider recent research in the designated fields. The emphasis will be upon individual studies and small group interaction. Enrollment is restricted to those students who have been admitted to the doctoral program in education and who have

completed substantial amounts of graduate study in the designated fields. Pr.: Consent of instructor. EDAF-989-0-0827

EDAF 994. Special Education. EDAF-994-2-0808

EDAF 999. Research in Administration and Foundations. (Var.) I, II, S. Individual investigation in the field of a student's specialization. Pr.: Sufficient training to carry on the line of research undertaken. EDAF-999-4-0801

Adult and Occupational Education

The Department of Adult and Occupational Education is composed of the adult and continuing education faculty and the occupational education faculty.

Adult and continuing education Professors Meisner* and Oaklief;* Associate Professors Carer* and Hausmann;* Assistant Professor Polson.

The faculty of adult and continuing education offer three graduate programs: a master's degree in adult and continuing education; a Ph.D. in adult and continuing education designed to prepare scholars for careers in college and university settings; and an Ed.D. that provides advanced education and experience to prepare people for business, industry, government, health services, community agencies, and careers in two- and four-year colleges and universities.

Courses focus on issues related to planning, developing, delivering, or facilitating instruction for adult learners.

The graduate programs are compatible with a variety of delivery settings where the following specializations and support areas are required or desired: (1) adult and continuing education, (2) extension education, (3) human resource development, (4) community education and development, and (5) in institutions, agencies, and organizations that deal primarily with adult needs and education.

Agriculture, business, and home economics education

Professors Welton;* Associate Professors Griffith,* Parmley,* and Wissman; Assistant Professors Angle and Harbstreet; Instructors Havlicek, Jankovich, and Kane; Emeriti: Prawl* and Terrace.

The undergraduate, master's, and doctoral degree programs offered focus on the development of professional and technical competencies in the delivery of vocational, occupational, and career education to diverse populations in secondary and post-secondary institutions, business and industry, and governmental agencies such as the Cooperative Extension Service.

Students completing the agricultural education undergraduate curriculum offered in cooperation with the College of Agriculture are awarded a bachelor of science degree in agriculture.

Students completing the business education undergraduate curriculum offered in cooperation with the College of Business are awarded a bachelor of science degree in education.

Students completing the home economics education undergraduate curriculum offered in cooperation with the College of Human Ecology are awarded a bachelor of science degree.

Graduate programs lead to master of science degrees with specializations in home economics or agriculture education. The faculty also participate in directing doctoral degree programs in agricultural education, home economics education, occupational education, teacher education, and college teaching.

Courses in adult and occupational education

Undergraduate credit

EDAO 300. Introduction to Agricultural Education. (1) I, II. Introduction to the program responsibilities, methodology, organization, current trends and issues, and future direction of programs in agricultural education. Students will be actively involved in the discussion and application of course material both in the classroom and in early field experiences conducted as a part of this course. EDAO-300-0-0899

EDAO 318. Adult and Continuing Education Colloquium. (Var.) On sufficient demand. Discussion, assigned readings, and lectures over selected trends, developments, and problems which are peculiar to the overall field of adult and continuing education. Students are encouraged to engage in self-study concerning their place in the profession of adult and continuing education. No more than 6 hours may apply to a degree. EDAO-318-0-0807

EDAO 319. Agricultural Education Colloquium. (Var.) I, II. On sufficient demand. Discussion, assigned readings, and lectures over the selected trends, developments, and problems which are peculiar to agricultural education in Kansas. Developments in new legislation, techniques, and philosophies are discussed and applied. Students are encouraged to engage in self-study concerning their place in the profession of agricultural education. EDAO-319-0-0899

EDAO 400. Leadership and Personal Development in Agricultural Education. (1) I, II. An examination of the role of the FFA advisor in the leadership and personal development of agricultural education students. EDAO-400-0-0899

Undergraduate and graduate credit in minor field

EDAO 500. Methods of Teaching Agriculture. (2) I, II. Lesson plans; organization of materials and direction of class, laboratory, and field instruction work in vocational agriculture; individual farming programs and class and group activities; coordination of farm mechanics work; administration, organization, and coordination of the Future Farmers of America organization with the program of instruction in vocational agriculture. Pr.: EDAF 315. EDAO-500-0-0899

EDAO 501. Independent Study in Education. (1-3) I, II. Selected topics in professional education. Maximum of 3 hours applicable toward degree requirements. Pr.: Consent of department head. EDAO-501-3-0899

EDAO 503. Teaching Adult Classes in Agriculture. (2-3) On sufficient demand. Organization and preparation of materials and methods used in teaching adult classes in vocational education in agriculture for young farmers and adults. Departments are visited for evaluation of programs and results. Pr.: EDAO 620. EDAO-503-0-0899

EDAO 505. Field Experience in Agricultural Education. (2-3) On sufficient demand. A course for prospective teachers to help bridge the gap between classroom theory and student teaching. Emphasis will be on observation of and participation in school and community organizations and programs. Pr.: EDAO 300 and EDAF 215 and consent of instructor. EDAO-505-0-0899

EDAO 550. Methods of Teaching Home Economics. (2) I. Selection of techniques: organization, preparation, and presentation of materials for teaching secondary programs. One hour rec. and 2 hours lab. a week. Pr.: Junior standing; EDAO 621 or conc. enrollment; taken semester prior to EDAO 586. EDAO-550-0-0899

EDAO 586. Teaching Participation in the Secondary School and Professional Development Seminar. (Var.) I, II. Observation and teaching participation under direction of selected teachers in middle level, junior, and senior high schools. Student teachers will participate in seminar sessions to discuss issues and experiences encountered during this school-based experience. Pr.: Admission to student teaching. See EDCI 586. EDAO-586-2-0803

Undergraduate and graduate credit

EDAO 611. Coordination Techniques. (1) II. Acquaints students with techniques in selecting, implementing, and coordinating occupational programs between the school and the business community. Pr.: EDAO 620. EDAO-611-0-0899

EDAO 612. Job Analysis. (1) II. Acquaints students with techniques of analyzing jobs and tasks related to occupations. Pr.: EDAO 620. EDAO-612-0-0899

EDAO 620. Principles and Philosophy of Vocational Education. (3) I, II, S. Provision for vocational education in Kansas and other states and countries; principles and philosophy underlying such education, relation of vocational education to school objectives and community, state, and national needs. Pr.: EDAF 215. EDAO-620-0-0839

EDAO 621. Program Planning in Vocational Education. (2-3) I, II, S. The program development and planning process; development of guides for teaching and evaluating reimbursable secondary programs. Pr.: EDAO 620. EDAO-621-0-0839

EDAO 701. Administration and Supervision of Vocational Education. (2-3) II, S. On sufficient demand. Emphasis on the duties and responsibilities of administrative and supervisory personnel responsible for the promotion, development, and coordination of comprehensive vocational-technical education programs at the local level. Pr.: Teaching experience or consent of instructor. EDAO-701-0-0839

EDAO 704. Extension Organization and Programs. (3) I, S. Development and objectives of Cooperative Extension and other University adult education programs; with emphasis on programs and procedures. Pr.: Senior standing or consent of instructor. EDAO-704-0-0807

EDAO 705. Organization Problems in Teaching Agricultural Mechanics. (Var.) On sufficient demand. Analysis of the agricultural mechanics course of study; needs and interests of students; learning difficulties; skills and technical knowledge required; correlation with agriculture; application of laws of learning to the teaching process; determination of objectives. Pr.: EDAO 586. EDAO-705-0-0839

EDAO 706. Principles of Teaching Adults in Extension. (3) II, S. Methods and principles of adult teaching, with emphasis on Cooperative Extension Service; application to various adult education programs. Pr.: Senior standing, juniors by consent of instructor. EDAO-706-0-0807

EDAO 710. Occupational Home Economics Education. (2) II, S. Principles and procedures in planning and organizing home economics-related occupational programs, including considerations of methods and teaching materials peculiar to these programs. Pr.: EDAF 215 or conc. enrollment. EDAO-710-0-0899

EDAO 713. Occupational Analysis. (2-3) I, II, S. An introduction to various techniques used in analyzing occupations and jobs. Emphasis on developing and organizing related instructional materials and content. Pr. or conc.: EDAO 620. EDAO-713-0-0807

EDAO 714. International Education. (3) On sufficient demand. Contemporary overview of the field of international education and an introduction to three of its parts: comparative education, intercultural education, and development education. Pr.: PSYCH 110. EDAO-714-0-0899

EDAO 725. Adult Basic Education Techniques. (3) On sufficient demand. Emphasis on providing students with an understanding of the selection, utilization, and development of adult basic education reference, resources, and other materials. Pr.: EDAF 215. EDAO-725-0-0807

EDAO 732-738. Practice in Adult and Occupational Education. (1-6) On sufficient demand. Related occupational or professional experiences in approved industry, school, Cooperative Extension Service, or similar agency setting under faculty supervision. Pr.: Consent of instructor.

EDAO 732. Career Education. EDAO-732-2-0807

EDAO 733. Adult Education. EDAO-733-2-0807

EDAO 734. Agriculture-Related Occupations. EDAO-734-2-0899

EDAO 735. Business and Office Occupations. EDAO-735-2-0807

EDAO 736. Extension Education. EDAO-736-2-0807

EDAO 737. Home Economics-Related Occupations. EDAO-737-2-0899

EDAO 738. Occupations in Business and Industry. EDAO-738-2-0839

EDAO 739. Coordination of Cooperative Vocational Education. (2-3) I, II, S. Emphasis on the legal aspects and other minimum requirements essential to conducting cooperative vocational education programs at the secondary and postsecondary levels. Pr. or conc.: EDAO 620. EDAO-739-0-0839

EDAO 740. Advising Youth Organizations. (2-3) On sufficient demand. An examination of the role of an advisor in the effective operation of a youth organization. Pr.: PSYCH 110. EDAO-740-0-0899

EDAO 750. Women, Education, and Work. (2-3) II, S. Emphasizes the collective and individual educational needs of women in and out of the work force and the part that occupational/educational preparation contributes to their participation in the work force. Pr.: SOCIO 211 or equiv. EDAO-750-0-0899

EDAO 753. Introduction to Occupational Education. (3) I, II, S. Overview of occupational education at all levels and its role in society. Designed for administrators, counselors, and vocational educators who perform a leadership function involving occupational education programs. Pr.: Teaching experience or consent of instructor. EDAO-753-0-0807

EDAO 754. Adult Basic Education. (3) On sufficient demand. Evolving adult basic and high school equivalency education concepts will be examined. Program implementation, supervision, methods, and materials are emphasized. Pr.: Adult teaching experience or consent of instructor. EDAO-754-0-0807

EDAO 775. Readings in Education. (1-3) I, II, S. Readings in research and application in specialized areas in education. May be taken more than once. Pr.: EDAF 215. No more than 3 hours may apply to a graduate degree. See EDAF 775 and EDCI 775. EDAO-775-3-0801

EDAO 780. Introduction to Adult Education. (3) I, II, S. A survey of adult education. Consideration given to articulation with other levels of education. Identification of changing needs within the field are reviewed. Pr.: Consent of instructor. EDAO-780-0-0807

EDAO 782. Educational Gerontology. (3) On sufficient demand. For both the practitioner and those interested in educational gerontology as a field of inquiry, this course will combine practice and theory. It will examine education for and about aging, with particular reference to the role, needs, and ability of persons in the later years as learners. Stressing current trends and prospective new developments in the field, it will include a review of present programs and discussion of the teaching-learning process for older adults. Pr.: EDAO 680. EDAO-782-0-0807

EDAO 786. Topics in Education. (1-3) I, II, S. Examination of current topic in area of specialization of faculty. Varied topics offered each semester so course may be repeated. Pr.: EDAF 215. See EDAF 786 and EDCI 786. EDAO-786-3-0801

EDAO 788. Seminar in Agricultural Education. (Var.) On sufficient demand. Seminars will consist of problems in the several fields of agricultural education represented in terms of special interests of the students. Undergraduate and graduate. Pr.: Consent of instructor. EDAO-788-0-0899

EDAO 790. Characteristics of the Adult Learner. (3) II, S. For teachers and administrators in adult and occupational programs who need a familiarity with the major characteristics of adulthood which affect the adult as a learner. Includes an examination of early, middle, and late adulthood. Pr.: EDAO 780 or EDAF 215 or PSYCH 110. EDAO-790-0-0807

EDAO 791. Career Education. (2-4) On sufficient demand. Emphasis on providing for prevocational and adult experiences including orientation and exploratory and applied experiences in school and nonschool situations. Pr.: Teaching experience or consent of instructor. EDAO-791-0-0839

EDAO 792. Hospital and Industry Adult Education. (3) On sufficient demand. An introduction to principles, roles, organization, procedures, and problems of adult education in hospitals, industry, and related agencies. EDAO-792-0-0839

EDAO 795. Problems in Adult and Occupational Education. (Var.) I, II, S. Independent study of specific problems in the areas of adult or occupational education. EDAO-795-3-0807

Graduate credit

EDAO 810. In-Service Education for Beginning Home Economics Teachers. (2-3) I, II, S. For beginning teachers who desire assistance with vocational program management, instructional planning and delivery, professional role development, and the organization of information related to vocational home economics teaching. Pr.: EDAO 550 or equiv. EDAO-810-0-0899

EDAO 811. Consumer Education. (2-3) S. Evaluate syllabi and approaches to teaching consumer education. Relate consumer education to consumer economics and consumer affairs. Pr.: EDAO 550 or 752 and FEC 400 or consent of instructor. See FEC 811. EDAO-811-0-0807

EDAO 815. Introduction to Community Educational Development. (3) A comprehensive review of factors related to community change and the role of educational programs in dealing with them. Emphasis is on educational and economic problem-solving approaches and change-implementing programs. EDAO-815-0-0807

EDAO 820. Advanced Methods in Adult Teaching. (3) On sufficient demand. Emphasis on teaching strategies, techniques, and media appropriate to various adult education programs. Pr.: Teaching experience or consent of instructor. EDAO-820-0-0807

EDAO 822. Young Farmer and Adult Farmer Education in Agriculture. (2-3) I, II, S. Organization, objectives, and procedures of conducting young farmer and adult farmer classes. Designed for teachers in service. Pr.: Experience in teaching vocational agriculture. EDAO-822-0-0899

EDAO 823. Agricultural Education for Beginning Teachers. (1-3) I, II. Securing and organizing information and planning teaching activities which will help the beginning vocational agriculture teacher. Pr.: Graduation from the curriculum in agricultural education. EDAO-823-0-0899

EDAO 825. Theory and Practice of Continuing Education. (3) I, S. Specific instruction on facilitating continuing education programs; emphasis on serving the institution, part-time students, community, and other interests. Pr.: EDAO 780 and 790. EDAO-825-0-0807

EDAO 830. Program Planning in Adult Education. (3) II, S. An examination of the basic situations in which adult education occurs and fundamental steps by which learning is made more effective in those situations. Pr.: Graduate standing and EDAO 790. EDAO-830-0-0807

EDAO 834. Trends in Home Economics Teaching. (Var.) I, II, S. Advanced study of evolving trends and materials for secondary programs; application to teaching and curriculum. Pr.: EDAO 621 and teaching experience. EDAO-834-0-0899

EDAO 840. Curriculum Development in Agriculture I. (2-3) S. Curriculum problems; planning local programs in agriculture; developing facilities and plans for meeting current and advanced problems in the teaching of agriculture. Pr.: One year of teaching in agriculture. EDAO-840-0-0899

EDAO 842. Curriculum Development in Agriculture II. (2-3) S. Continuation of EDAO 840. Pr.: EDAO 840 or consent of instructor. EDAO-842-0-0899

EDAO 844. Curriculum Development in Vocational Home Economics. (3) I, S. The course focuses on current trends in vocational home economics curricula. Designed especially to assist home economics teachers and supervisors in the articulation of secondary programs, analysis, and development of curriculum models for specific school situations. Pr.: EDAO 620. EDAO-844-0-0899

EDAO 845. Field Studies in Agricultural Education. (2-3) On sufficient demand. Planning, organizing, and coordinating the various phases of the local program of vocational education in agriculture. Pr.: Experience in teaching agriculture or consent of instructor. EDAO-845-0-0899

EDAO 860. Nontraditional Study for Adults. (3) II, S. Designed to provide a conceptual understanding of current forms of nontraditional study and accreditation with emphasis on organizing studies to serve adult needs. Pr.: EDAO 780. EDAO-860-0-0807

EDAO 864. Assessment in Home Economics Education. (3) II, S. A study of evaluation theory and techniques for home economics educators. The primary emphasis will be placed upon program, process, and product evaluation relative to federal, state, and local home economics education programs. Pr.: EDAF 315 or equiv. EDAO-864-0-0899

EDAO 890-892. Seminars in Education. Credit arranged. On sufficient demand. These seminars will consider research and professional development on the special interests of the students in the several fields of education represented. Pr.: Consent of instructor.

EDAO 890. Home Economics Education. EDAO-890-0-0899

EDAO 891. Agricultural Education. EDAO-891-0-0899

EDAO 892. Adult Education. EDAO-892-0-0807

EDAO 899. Master's Research. (Var.) I, II, S. Pr.: Consent of instructor. EDAO-899-3-0839

EDAO 910. Occupational Experience Supervision. (3) II, S. Analysis of objectives and scope of occupational experience programs. Emphasis is placed on the organization, administration, related instructional procedures, coordination techniques, and evaluation of occupational experience programs. Pr.: Teaching experience or consent of instructor. EDAO-910-0-0807

EDAO 914. Technical Education. (3) I, S. An analysis of the evolving role of technical education and other postsecondary occupational education with emphasis upon principles underlying organization and practice unique to technical education. Pr.: Graduate standing. EDAO-914-0-0839

EDAO 916. Foundations of Adult Education. (3) On sufficient demand. A study of adult education historical perspectives, contemporary institutions and programs, teaching-learning process, administrative practices, and conceptual roles. Pr.: One year of field experience or approval of instructor. EDAO-916-0-0807

EDAO 929. Supervision in Occupational Education. (2-3) I, S. Philosophy and principles of effective supervision related to occupational education programs; application of principles to problems met by student teacher supervisors. Pr.: Teaching experience or consent of instructor. EDAO-929-0-0839

EDAO 937. Organization and Administration of Adult Education. (3) I, S. A critical study of organizational procedures and administrative practices as related to the implementation and maintenance of an effective program in adult education. Pr.: Graduate standing. EDAO-937-0-0807

EDAO 940. Organization and Administration of Occupational Education. (3) I, S. An overview of the organization of occupational education programs in agriculture, business, distributive education, health, home economics, trade and industry, technical, and related fields and their administration. Emphasis on federal-state-local relationships. Pr.: EDAO 701 or consent of instructor. EDAO-940-0-0807

EDAO 952. Internship in Adult and Occupational Education. (Var.) On sufficient demand. Studies of and field experiences in the development of programs in cooperating schools and educational or related agencies under the supervision of College of Education graduate faculty members. A maximum of 6 credit hours. Pr.: Consent of instructor. EDAO-952-2-0807

EDAO 962. Advanced Seminars in Adult and Occupational Education. (Var.) On sufficient demand. These seminars will critically consider recent research in the designated fields. The emphasis will be upon individual studies and small group interaction. Enrollment is restricted to those students who have been admitted to the doctoral program in education and who have completed substantial amounts of graduate study in the designated fields. Pr.: Consent of instructor. EDAO-962-0-0807

EDAO 999. Research in Adult and Occupational Education. (Var.) I, II, S. Pr.: Sufficient training to carry on the line of research undertaken and consent of instructor. EDAO-999-4-0807

Curriculum and Instruction

Emmett L. Wright, Head
Paul Burden, Associate Head

Professors Boyer,* Brookhart,* Hause,* Heerman,* Horn,* Koeppe,* Kurtz,* Lindsey, Price,* Schell,* Staver,* and Wright;* Associate Professors Alexander,* Burden,* Enochs,* Hortin,* Laurie,* Perl,* Sturr,* and Talab;* Assistant Professors Byars,* Clegg, Deering, Harris, Heller,* McGrath,* McLellan, K. Holen, McFarlin, B. Newhouse, Oliver,* Scharmann,* Smith, and Weimer;* Emeriti: Professors Bartel, Craig, Littrell,* McAnarney,* Smethers, and Trennepohl.*

The Department of Curriculum and Instruction houses undergraduate and graduate programs in teacher education. There are two undergraduate degree programs in the department: elementary education—a four-year program leading to certification as an elementary school teacher; and secondary education—a four-year program leading to certification as a secondary school teacher in one or more of the following fields: art, English, journalism, mathematics, modern languages, speech, natural sciences, and social science. In addition, the department provides teaching methods courses and secondary education student teaching experiences for the College of Arts and Sciences to degree programs in music education and physical education.

An equally important mission of the department is expansion of the knowledge base of curriculum studies, teaching, and learning. Research and development efforts that have implications for improvement of practice and that clarify relationships among curricular decisions, instructional decisions, student outcomes, and educational equity are especially valued.

The graduate programs offered through the department lead to the master of science, doctor of philosophy, and doctor of education. The areas of specialization at the graduate level are: elementary education, secondary education, college teaching, computer-based education, science education, environmental education, mathematics education, social studies education, multicultural education, educational media and technology, reading/language arts, and curriculum and instruction leadership. Graduate programs leading to certification as a reading specialist, school library/media specialist, or supervisory specialist also are offered by the department, and may be incorporated into work for an advanced degree.

The department offers graduate courses in off-campus settings and collaborates closely with the Center for Economic Education, the Center for Science Education, and the Center for Extended Studies delivering quality courses, workshops, and consultancies for Kansas schools. These activities address in-service, recertification, and/or graduate program needs of educators.

Undergraduate credit

EDCI 050. Developmental Reading Laboratory. (3) I, II. Improves the college student's reading skills, rates of comprehension, vocabulary, and study skills. Pr.: Consent of instructor. EDCI-050-1-0801

EDCI 051. Study Skills Laboratory. (1-3) I, II. Helps the student to learn effective study methods, analyze difficulties in reading and studying, and prepare for and improve performance in examinations. EDCI-051-0-0829

EDCI 217. Introduction to the Library. (1-2) I, II. Use of the library to find information for papers and/or library-related assignments. Modular format permits study of reference materials related to the student's field of study. EDCI-217-3-0801

EDCI 218. Teacher Education Colloquium. (1-2) On sufficient demand. Discussion, assigned readings, and lectures over selected trends, developments, and problems in the field of teaching. EDCI-218-0-0801

EDCI 300. Principles of Elementary Education. (3) I, II. An overall view of the elementary school: organization, management, purpose, curriculum trends, and pupil characteristics. Pr.: Junior standing. EDCI-300-0-0802

EDCI 318. Instructional Media and Technology. (2) I, II. Experiences in the selection, production, use, and evaluation of instructional materials. Applications of technology in education, including microcomputer use, but not programming. Operation and simple maintenance of equipment. Pr.: Admission to teacher education. EDCI-318-1-0801

EDCI 376. Core Teaching Skills: Secondary/Middle. (3) I, II. General teaching practices and the opportunity to apply that information in a laboratory setting. Two hours of lec. and two of lab a week. Pr.: Admission to teacher education, DED 102, and EDAF 215. Must be taken simultaneously with EDAF 315 and 323. EDCI-376-I-0803

EDCI 420. Block II Lab Content and Reading Methods. (1) I, II. Field-based experience to help the pre-professional teacher practice the incorporation of specific content area with reading methods in the secondary and middle schools. Pr.: EDAF 315, 323, and EDCI 376. Simultaneous enrollment required for EDCI 420, 477, and either 476, EDAO 500, or 550. EDCI-420-I-0803

EDCI 451. Principles of Secondary Education. (3) On sufficient demand. Junior and senior high school organization and objectives, their genesis and curriculum trends, characteristics of student population, and legal status and practices. Pr.: EDAF 315. EDCI-451-0-0803

EDCI 455. Teaching in a Multicultural Society. (1) I, II. Application of multicultural understandings to teaching in a multicultural society. Strategies for working effectively with students to achieve educational equity. Pr.: EDCI 420, 477, and either EDCI 476, EDAO 500, or 550. Simultaneous enrollment required for EDCI 455, EDAF 525, and either EDCI 586 or EDAO 586. EDCI-455-0-0801

EDCI 469. Physical Education in Elementary Schools. (3) I, II. Methods of teaching and organization of materials in a progression for an elementary physical education program. Pr.: Admission to teacher education, PE 206, and at least two courses from the elementary physical education specialization. EDCI-469-0-0802

EDCI 470. Science for Elementary Schools. (3) I, II. The relationships among nature, environment, and elementary science in their roles in childhood education resources and activities suitable to the elementary school. Pr.: Admission to teacher education. EDCI-470-1-0834

EDCI 471. Language Arts for Elementary Schools. (3) I, II. Modern trends in the teaching of reading, oral language, composition, and spelling. Pr.: Admission to teacher education. EDCI-471-1-0802

EDCI 472. Social Studies for Elementary Schools. (3) I, II. Course of study content as a basis for consideration for modern classroom procedure; objectives and problems in the teaching of social studies. Pr.: Admission to teacher education. EDCI-472-I-0802

EDCI 473. Mathematics for Elementary Schools. (3) I, II. The teaching of mathematics in the elementary schools, including the nature of mathematical processes, curriculum, methods of instruction, instructional materials, and the evaluation of outcomes. Pr.: Admission to teacher education. EDCI-473-I-0833

EDCI 474. Elementary School Reading. (3) I, II. An introductory course in the content, methods, and materials of the total reading program in the elementary school. Pr.: Admission to teacher education. EDCI-474-I-0830

EDCI 476. Content Area Methods in the Secondary School. (2-3) I, II. Principles of teaching applied to content area instruction in the secondary school; motivation; organization of subject matter; lesson planning; evaluation and reporting; challenging the levels of ability; organization and management of the classroom; methodology and materials of the secondary schools. Pr.: EDAF 315, 323, and EDCI 376. Simultaneous enrollment required for EDCI 420, 477, and either EDCI 476, EDAO 500, or 550. EDCI-476-I-0803

EDCI 477. Middle Level/Secondary Reading. (2) I, II. Introduction and development of effective study/skilled reading strategies and abilities for learning from content area text material. Pr.: EDAF 315, 323, and EDCI 376. Simultaneous enrollment required for EDCI 476, EDAO 500, or 550. EDCI-477-0-0803

Undergraduate and graduate credit in minor field

EDCI 502. Independent Study in Education. (1-3) I, II, S. Selected topics in professional education. Maximum of 3 hours applicable toward degree requirements. Pr.: Consent of department head. EDCI-502-3-0801

EDCI 560. Art for Exceptional Children. (3) II. Use of art courses and activities to meet the needs of the mentally retarded, physically impaired, emotionally disturbed, or gifted child. Three hours lec. Pr.: PSYCH 110. Same as ART 560. EDCI-560-0-0831

EDCI 582. Teaching Participation in Music. (8-12) I, II. Observation and teaching under the direction of selected music teachers in elementary, middle level, and secondary school music programs. Pr.: Admission to student teaching. EDCI-582-2-0832

EDCI 585. Teaching Participation in the Elementary School. (Var.) I, II. Observation and teaching participation under the direction of selected elementary teachers. Pr.: EDCI 300, 470, 471, 472, 473, 474, and admission to student teaching. EDCI-585-2-0802

EDCI 586. Teaching Participation in the Secondary Schools and Professional Development Seminar. (Var.) I, II. Guided observation, teaching participation, and study of teaching practices under direction of selected teachers in middle/junior and senior high schools. Pr.: EDCI 420, 477, and either 476, EDAO 500, or 550. Simultaneous enrollment required for EDCI 455, EDAF 525, and either EDCI 586 or EDAO 586. EDCI-586-2-0803

Undergraduate and graduate credit

EDCI 600. Reading with Practicum. (3) I, II. Supervised observation and teaching of reading in approved school classrooms. Pr.: EDCI 474 or teaching experience. May not apply to reading specialist endorsement. EDCI-600-0-0802

EDCI 614. Laboratory Techniques in Teaching Science. (3) I, II. Rationale for laboratory in secondary school science. The design and implementation of laboratory activities and demonstrations in a high school science program. Pr.: EDCI 476 (Science). EDCI-614-1-0834

EDCI 704. Extra-Class Activities. (3) On sufficient demand. Organization, sponsorship, and objectives of clubs, publications, athletics, dramatics, musical organizations, assemblies, home room, and student council in junior and senior high schools. Pr.: Senior standing or consent of instructor. EDCI-704-0-0803

EDCI 705. Organization and Processing of Instructional Materials. (2) I. Supervisory experiences in cataloging, organization, arrangement, and processing of print and nonprint materials for media centers and libraries. Issues in and approaches to coding and bibliographic concepts are explored. Pr.: EDCI 318 and ENGL 540 or 545. EDCI-705-1-7-0801

EDCI 706. Aerospace Education Workshop. (3) S. To provide elementary and secondary teachers with knowledge, skills, and attitudes about aerospace activities and the total impact of air and space vehicles upon society. Pr.: EDCI 586 or teaching experience. EDCI-706-1-0801

EDCI 714. Understanding and Teaching Reading. (3) On sufficient demand. Foundational issues in K-12 reading instruction. Focus on the reading process, the nature of the learner, the text, and the instructional setting. Pr.: EDCI 585, 586, 582, or EDAO 586. EDCI-714-0-0803

EDCI 715. Reading in the Content Areas. (3) On sufficient demand. Information concerning the reading process and techniques for helping students develop reading and study skills needed in the content areas. Course is designed for classroom middle level and secondary teachers. Pr.: Senior standing. EDCI-715-0-0830

EDCI 717. Corrective Reading Instruction. (1-3) On sufficient demand. Supervised tutoring of children with reading difficulties. Not open to students with credit in EDCI 947. Pr.: Student teaching experience. EDCI-717-2-0817

EDCI 718. Microcomputers in Instruction. (2) I, II, S. Trends in computer applications in instruction, major components and functions of microcomputer instructional systems, and use of authoring systems for computer-assisted instruction. Does not prepare the student to teach computer programming. Pr.: EDCI 585 or 586. EDCI-718-0-0801

EDCI 719. Microcomputers in Instruction Lab. (1) I, II, S. Applications of BASIC and PASCAL to design of computer-assisted instruction and other classroom application of microcomputers. One two-hour lab a week. Conc. with EDCI 718. Pr.: CIS 200 and 207. EDCI-719-1-0801

EDCI 720. Foreign Language Methods for Elementary Schools. (3) On sufficient demand. Methods of teaching and organization of materials for the foreign language program in the elementary school. Pr.: Educational Psychology II, 24 hours in the foreign language, and conc. enrollment in either Preprofessional Lab (DED 100, I cr.) or Teaching Participation in the Elementary School (EDCI 585, 4 cr.). EDCI-720-0-0802

EDCI 721. Economic Education Workshop. (3) S. Basic economic concepts and how to integrate them into elementary and secondary curriculums and an examination of recent economic education materials. Pr.: Senior standing or higher. EDCI-721-0-0801

EDCI 723. Computer Applications in Subject Areas. (1-3) On sufficient demand. Theory and practice of using computer software to enhance teaching and learning in specific subject areas. Subjects covered will vary. May be repeated for credit in different subject areas. Pr.: EDCI 318 and EDAF 315. EDCI-723-0-0829

EDCI 725. The Teacher and Child Abuse. (3) On sufficient demand. An exploration of child abuse and neglect with specific references to legal and moral responsibilities of teaching. Suggestions for detection, reporting, and responsive instruction for suspected cases of child abuse and neglect. Pr.: PSYCH 110 and junior standing. EDCI-725-0-0801

EDCI 730. Education of the Disadvantaged. (3) On sufficient demand. Consideration of the life-space of the disadvantaged learner and its relationship to curriculum, organization, and interpersonal relationships in schools. The development of realistic, relevant goals for the teacher of the disadvantaged. Pr.: EDAF 611 or 410. EDCI-730-0-0813

EDCI 733. Curriculum Materials for Ethnic Diversity. (3) On sufficient demand. An examination and analysis of recent materials and practices of schools serving multiethnic student bodies, particularly minorities from disadvantaged backgrounds. Materials include any items used by the school in implementing the curriculum. Pr.: Senior standing or higher. EDCI-733-2-0801

EDCI 735. Curriculum Materials for Nonsexist Teaching. (3) II, S. Analysis of recent materials from perspective of concern with their potential for sex-role stereotyping. Examination of teaching resource materials for curriculum intended to facilitate nonsexist teaching. Pr.: Junior standing or higher. EDCI-735-0-0829

EDCI 737. Drug Abuse Education. (3) On sufficient demand. Emphasis on the development of effective drug abuse education programs with attention given to the role delineation for schools and teachers. Materials and procedures for developing values and attitudes in an education setting. Pr.: Senior standing. EDCI-737-0-0801

EDCI 739. Environmental Education. (1-3) On sufficient demand. The selection, adaptation, and development of environmental education K-12 curriculum materials; procedures for an integrated curricular implementation; the selection of appropriate instructional strategies. Pr.: EDAF 302 and a course in environmental studies. EDCI-739-0-0801

EDCI 741. German Culture in Second-Language Learning. (3) Emphasis on the study of German culture and application to German curriculum, including the development of materials. Pr.: Twenty-four credits in 200 and above in German or equiv. (Same as GRMN 741). EDCI-741-0-0829

EDCI 756. Visual Communication. (3) I, alternate S. Implications of visual communication and learning for the design of instructional programs. Pr.: Graduate standing or EDCI 318 and EDAF 315. EDCI-756-0-0829

EDCI 762. Instructional Television. (3) II, alternate S. The principles of instructional television: its development, programming, techniques, and application. Pr.: Junior standing. EDCI-762-1-0801

EDCI 763. Instructional Design. (3) I, alternate S. Implications of the major theories and models of instructional design to the development of instructional programs. Pr.: EDCI 318 and EDAF 315. EDCI-763-0-0829

EDCI 764. Telecommunications in Education II. (Var. 2-3) Alternate S. Examination of the relationship of current telecommunications media and hardware to the design of instruction. Pr.: EDCI 318 and permission of instructor or graduate standing. EDCI-764-0-0829

EDCI 765. Planning and Developing Instructional Materials. (3) II, S. The principles and processes involved in planning and producing instructional materials, ranging from the preparation of simple graphic and photographic materials to computer-assisted programmed instruction. Pr.: EDCI 861 or consent of instructor. EDCI-765-1-0801

EDCI 770. Methods for Second Language Acquisition/Learning. (3) On sufficient demand. Study of the development of second language instruction, both historical and current. Syntax, morphology, discourse analysis, and global proficiency evaluation are foci for analysis of methods and for the development of a personal method of teaching. Pr.: EDCI 476 and 24 credits in one second language at 200 level and above or equivalent. EDCI-770-0-0829

EDCI 775. Readings in Education. (1-3) I, II, S. Readings in research and application in specialized areas in education. May be taken more than once. Pr.: EDAF 215 or EDAO 540. See EDAF 775 and EDAO 775. EDCI-775-3-0829

EDCI 776. Teaching in the Middle/Junior High School. (3) On sufficient demand. Several instructional approaches consistent with the characteristics of the emerging adolescent student (grades 5-9) will be examined in relation to current research. Direct development of alternative curricular programs, appropriate use of interdisciplinary activities and nontraditional materials will be emphasized. Pr.: EDAF 315, middle level field experience, elementary or secondary content methods course. EDCI-776-0-0829

EDCI 777. Hispanic Cultures in Second-Language Learning. (3) Emphasis on the study of Spanish culture and applications to the Spanish curriculum, including the development of materials. Pr.: Twenty-four credits in Spanish at 200 or above or equivalent. Same as SPAN 777. EDCI-777-0-0829

EDCI 779. Primary School Education. (3) On sufficient demand. A course for those interested in the kindergarten and primary school child. Emphasis will be placed on curriculum development, pertinent research, and innovative practices in early education. Pr.: EDAF 315. EDCI-779-0-0823

EDCI 780. Kindergarten Education. (3) On sufficient demand. A specialized study of the kindergarten in the American school: methods and materials for working with the kindergarten child, including communication and explanation skills and readiness for reading. Pr.: EDAF 215, EDCI 300, and junior standing. EDCI-780-0-0823

EDCI 786. Topics in Education. (1-3) I, II, S. Examination of current topic in area of specialization of faculty. Varied topics offered each semester so course may be repeated. Pr.: EDAF 215. See EDAF 786 and EDAO 786. EDCI-786-0-0829

EDCI 795. Problems in Curriculum and Instruction. (Var.) I, II, S. Independent study of a specific problem in curriculum or instruction. Pr.: Junior standing or higher. EDCI-795-3-0823

Graduate credit

EDCI 803. Curriculum Development. (3) I, II, S. An overall view of the entire school curriculum, patterns of organization, outlining of instructional fields, and specific helps in curriculum development for administrators and classroom teachers. Pr.: Twelve hours of education or consent of instructor. EDCI-803-0-0829

EDCI 805. Curriculum Construction for Elementary and Secondary Schools. (2-3) On sufficient demand. Procedures for organizing and conducting programs for curriculum improvement in the elementary and secondary schools; techniques for the development and evaluation of curriculum materials. Opportunity is provided for work on individual curriculum problems. Pr.: EDCI 803. EDCI-805-0-0829

EDCI 808. Curriculum in the Inner City. (3) On sufficient demand. Exploration of research and innovations in curriculum and instruction for inner city schools. Emphasis on curricular and instructional difficulties in low-income communities and on productive compensatory educational practices. Pr.: EDCI 803. EDCI-808-0-0801

EDCI 811. Reference and Information Sources. (3) I, alternate S. Evaluation of print and non-print reference and information sources, reference processes and services, and emerging technologies in reference for school library media centers. Pr.: Graduate standing in library/media specialist program. EDCI-811-0-0829

EDCI 816. Approaches to Reading Instruction. (3) On sufficient demand. A critical study of approaches, materials, and methods for effective reading instruction. Pr.: EDCI 582, 585, 586, or EDAO 586. EDCI-816-0-0803

EDCI 817. Reading Comprehension. (3) On sufficient demand. Reviews comprehension theory and research; explores strategies for developing reading comprehension in readers. K-12; examines evaluative devices for assessing comprehension abilities. Pr.: EDCI 600 or 715. EDCI-817-0-0830

EDCI 820. Trends In Elementary School Language Arts. (3) On sufficient demand. An analysis of current methods, issues, and trends in teaching, speaking, listening, and writing through the study of significant literature and research findings. Pr.: Teaching experience. EDCI-820-0-0802

EDCI 821. Contemporary Mathematics Education in the Elementary School. (3) On sufficient demand. Advanced study of selected topics in elementary school mathematics emphasizing new programs, trends, controversial topics, and new recommendations for persistent problems; findings of recent research stressed. Pr.: Teaching experience. EDCI-821-0-0833

EDCI 822. Trends in Elementary School Social Studies. (3) On sufficient demand. Current methods, materials, issues, and trends in developing social consciousness among elementary school children. Social science strategies usable by children. Pr.: Teaching experience. EDCI-822-0-0802

EDCI 825. Creative Language Expression in the Elementary School. (3) On sufficient demand. Developing experiences in creative expression as part of the elementary school English language arts program; role of the arts in fostering creative language expression, strategies for teaching and evaluating creative writing and dramatic arts. Pr.: EDCI 471. EDCI-825-0-0802

EDCI 831. Leadership for Improved Instruction. (3) II, S. A consideration of the relationship and techniques involved when teachers, supervisors, and administrators plan and implement improvement of instruction. Pr.: EDCI 585 or 586 or EDAO 680. EDCI-831-0-0801

EDCI 832. Individualized Instructional Programs. (3) On sufficient demand. A study of the rationale, procedures, techniques, and materials which are appropriate and necessary to individualizing instructional programs. Particular emphasis given to organizational structure, curriculum, and administration of nongraded, multigraded, and multitracked programs. Pr.: Teaching experience. EDCI-832-0-0801

EDCI 833. Creativity in Education. (3) II, S. Clarification of creativity in education, discovery of creative talent, methods of encouraging creative talent; emphasis on learning models and research in creativity as compared with or contrasted with conformity; emphasis on divergent and convergent thinking and its role in creative teaching with major consideration given to the student's involvement in creative study and/or teaching. Pr.: Teaching experience. EDCI-833-0-0801

EDCI 834. Improving Elementary Science Teaching. (3) On sufficient demand. Evaluation and implementation of psychological and philosophical foundations will be stressed in improving elementary science teaching. Recent materials will be compared and their unique and common elements examined. Pr.: Teaching experience. EDCI-834-1-0834

EDCI 835. Supervision of Student Teaching. (3) II. Organization and functions of student teaching programs; orienting, supervising, and evaluating student teachers in elementary and secondary schools. Pr.: Teaching experience. EDCI-835-0-0801

EDCI 840. Diagnosis of the Reader. (3) On sufficient demand. Principles, procedures, and instruments for the diagnosis of reading disabilities. Pr.: EDCI 714 or 816 or EDAF 663 and student teaching. EDCI-840-0-0817

EDCI 841. Remediation of Reading Disabilities. (2) On sufficient demand. Selected theories, research, approaches, materials, and techniques appropriate for remediating reading problems of students in grades K-12. Pr.: EDCI 816 or 840. EDCI-841-0-0817

EDCI 842. Directed Professional Development. (5) On sufficient demand. Research and teaching under supervision in the secondary school. Open only to outstanding liberal arts graduates enrolled in the special program for the professional preparation of such graduates for teaching in critical areas in secondary schools. Pr.: Registration in Graduate School. EDCI-842-0-0803

EDCI 843. Principles of College Teaching. (3) I, II. Principles of learning, learning theory, educational objectives, methods and techniques, college students, and evaluation in the classroom. Emphasis upon preservice and in-service help in improving instruction at the college level. Pr.: Teaching experience. EDCI-843-0-0805

EDCI 844. Current Issues in College Teaching. (2) On sufficient demand. Objectives, problems, and evaluation of college instruction, purpose of the university, creative teaching, student involvement and unrest, and current issues. Individual study of special interest topics. Pr.: EDCI 843. EDCI-844-0-0805

EDCI 845. Advanced Elementary School Reading. (3) On sufficient demand. A study and evaluation of selected theories, programs, practices, and materials, K-6, emphasizing current trends, issues, and problems. Pr.: EDCI 474. EDCI-845-1-0830

EDCI 846. Diagnosis and Treatment of Reading Disabilities. (3-4) On sufficient demand. A systematic study of the causes of reading problems, the use and interpretation of diagnostic instruments and procedures, and special materials and methods of remedial instruction. Includes diagnosis of a child with a reading problem. Pr.: EDCI 715 or 845 and teaching experience. EDCI-846-3-0817

EDCI 847. Advanced Clinical Practicum in Reading. (3) S. Supervised experience in diagnosing and teaching students with reading problems. Pr.: EDCI 840 and 841. EDCI-847-0-0817

EDCI 848. Organization and Administration of Reading Programs. (2) On sufficient demand. An investigation of several topics of special interest to educators responsible for developing a total reading program, K-12, with special attention to the remedial reading program. Pr.: EDCI 715 or 845. EDCI-848-0-0817

EDCI 861. Educational Technology. (2-3) Principles and techniques in the use of visual and audiovisual materials; operation and maintenance of equipment and sources of supply. Pr.: Completion of student teaching or graduate standing. EDCI-861-1-0801

EDCI 863. Interactive System Design. (3) II, alternate S. Examination of the use of cognitive science as a theoretical base for the design of interactive learning systems. Emphasis on human factors, interactivity, and systems theories. Pr.: EDCI 763. EDCI-863-0-0829

EDCI 873. The Science Curriculum. (3) On sufficient demand. National curriculum programs and projects at both elementary and secondary levels. Evaluation of appropriateness of content as it relates to a philosophy of science education. Modes for investigating scientific phenomena and their subsequent use in teaching the processes of the scientists. Pr.: EDCI 803. EDCI-873-0-0834

EDCI 874. The Mathematics Curriculum. (3) On sufficient demand. Trends in the teaching and supervision of mathematics. Analysis of literature and research relating to content, methods, and materials of mathematics education. Pr.: EDCI 803, experience teaching mathematics. EDCI-874-0-0833

EDCI 876. The Social Studies Curriculum in the Secondary School. (3) On sufficient demand. New trends, materials, and ideas in teaching the social sciences, based on recent research and experimental programs. Pr.: EDCI 803. EDCI-876-0-0803

EDCI 877. The Foreign Language Curriculum. (3) On sufficient demand. New trends and materials in teaching the foreign languages, based on recent research and experimental programs. Pr.: EDCI 803. EDCI-877-0-0829

EDCI 878. The Language Arts Curriculum. (3) On sufficient demand. The changing scene in the teaching of English: trends, materials, and ideas in literature, composition, and grammar that have emerged from recent research and discovery. Pr.: EDCI 803. EDCI-878-0-0801

EDCI 882. Teacher Self-Assessment. (3) I. A systematic study of how teachers can improve their instruction in an autonomous fashion (K-12 and higher education). Major topics include: videotape recording, verbal and nonverbal cues, means-referenced objectives, observation tools, student feedback instruments, and peer feedback. For teachers, administrators, and supervisors interested in improving or assisting people in improving their instruction. Pr.: EDCI 803 or 843. EDCI-882-0-0829

EDCI 886. Seminars in Curriculum and Instruction. (Var.) On sufficient demand. These seminars will consider research in the several fields of education represented in terms of the special interests of the students. Pr.: Teaching experience. EDCI-886-0-0829

EDCI 898. Master's Report. (Var.) I, II, S. Pr.: Permission by department head. EDCI-898-3-0829

EDCI 899. Master's Research. (Var.) I, II, S. Pr.: Permission by department head. EDCI-899-3-0829

EDCI 907. Curriculum Theory. (3) I. Theoretical concepts underlying significant curriculum developments. A systematic critique of current curricular theory. Consideration of model generation. Pr.: EDCI 803. EDCI-907-0-0829

EDCI 908. Instructional Theory. (3) On sufficient demand. Comprehensive analysis of research on the teaching process. Theoretical models for understanding teacher-pupil interaction. The design of studies on factors affecting teacher behavior and classroom learning. Pr.: EDCI 831 or EDAF 920. EDCI-908-0-0829

EDCI 910. Multicultural Curriculum Programming. (3) I, S. Application of multicultural curriculum principles to total school programming with particular emphasis on the cultural pluralism phenomenon. Includes analytic review of instruments on multicultural/multiracial curriculum evaluation as well as planning skills for equitable thrusts. Primarily involves elementary and secondary focus with some attention to postsecondary programming. Pr.: EDCI 803 or 808 or equiv. EDCI-910-0-0829

EDCI 911. Optical Information Systems. (3) I, alternate S. Theoretical, practical, and research implications of optical information systems. Includes data conversion, authoring systems, and interface issues in design and implementation for education and training. Pr.: EDCI 718 or consent of instructor. EDCI-911-0-0829

EDCI 920. Design and Evaluation of Educational Software. (3) I, alternate S. Application and analysis of the principles of instructional design as related to educational software. Pr.: EDCI 719 and proficiency in a programming language or authoring system. EDCI-920-0-0829

EDCI 960. Educational Media Programs. (3) On sufficient demand. Organization, administration, and evaluation of educational media service programs, with emphasis on the provision of services, materials, equipment, facilities, staff, and financial resources essential in support of modern instructional programs. Includes studies of programs in varying sizes and types of educational institutions. Pr.: EDCI 861. EDCI-960-0-0801

EDCI 966. Selecting and Evaluating Instructional Materials. (3) On sufficient demand. Principles and procedures for evaluating graphic, photographic, and audio instructional materials. Development of evaluative criteria, instruments, and utilization guides. Sources for selecting instructional materials. Pr.: EDCI 861. EDCI-966-1-0829

EDCI 972. Advanced Study of the Reading Process. (3) On sufficient demand. Survey of selected theories of the reading process. Investigation of the interrelationships of the reading act: cognitive processes; language; social-emotional factors; and experience. Emphasis upon recent developments in the field. Pr.: EDCI 845 or 715. EDCI-972-0-0830

EDCI 979. Community/Junior College Curriculum. (3) I, II, S. Evaluation of community/junior college curricula, reasons for revision, aims and objectives. Designed to familiarize students with the entire curricular offerings of the comprehensive community/junior college. Pr.: EDAF 832. EDCI-979-0-0806

EDCI 980. The Curriculum Information Consultant. (3) On sufficient demand. The process skills and knowledge needed for the retrieval and dissemination of curriculum information. For teachers and administrators involved with helping others in curriculum development. Pr.: EDCI 803, 808, or 979. EDCI-980-0-0829

EDCI 990. Internship in College Teaching. (2-6) I, II, S. An experiential course for graduate students devoted to improving instruction. Supervised teaching of college classes and seminars in conjunction with cooperating departments. Pr.: Master's degree, EDCI 843 or 844, and consent of department head. EDCI-990-2-0805

EDCI 991. Internship in Curriculum and Instruction. (Var.) I, II, S. Studies of and field experiences in the development of programs in cooperating schools and educational or related agencies under the supervision of College of Education graduate faculty members. A maximum of 6 credit hours may be chosen from the areas listed. Pr.: Consent of department head. EDCI-991-2-0829

EDCI 999. Research in Curriculum and Instruction. (Var.) I, II, S. Pr.: EDAF 817 and/or consent of instructor. EDCI-999-4-0829

Engineering

Donald E. Rathbone, Dean
 Kenneth K. Gowdy, Associate Dean
 John P. Dollar, Assistant Dean
 Ray E. Hightower, Assistant Dean
 Andrew D. Cordero, Director of Minorities Programs

146 Durland Hall
 532-5590

A course of study leading to a degree in the College of Engineering provides a well-rounded university education and equips the student with a broad theoretical and practical background to meet the new and demanding problems of our technological society.

The College of Engineering offers the bachelor of science degree in the following fields: agricultural engineering, architectural engineering, chemical engineering, civil engineering, computer engineering, construction science, electrical engineering, engineering technology, industrial engineering, mechanical engineering, nuclear engineering.

The master of science degree is offered in each of the preceding areas except construction science and engineering technology.

To provide the engineering graduate student with maximum access to all of its resources (including faculty and laboratories), the College of Engineering offers the

Ph.D. degree in engineering. The student may study in one of the traditional areas or develop a program of study to fit particular interests and needs. Major areas are: agricultural engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering, nuclear engineering, systems engineering, materials science, energy processes, bioenvironmental engineering, and information processing.

Additional information on the graduate program is included in the section on the Graduate School section of this catalog.

General Requirements

General engineering (DEN)

Entering freshmen who are undecided as to a major in engineering may enroll in general engineering for one year. They will take the following program of study, which is completely applicable to all engineering programs.

| | |
|--|--|
| Fall semester | |
| ENGL 100 | English Composition I 3 |
| CHM 210 | Chemistry I 4 |
| MATH 220 | Analytic Geometry and Calculus I .. 4 |
| DEN 160 | Engineering Concepts 2 |
| Humanities or social science electives | 3 |
| PE 101 | Principles of Physical Fitness 1 |
| | 17 |

| | |
|---------------------------------------|--|
| Spring semester | |
| ENGL 120 | English Composition II 3 |
| | or |
| Elective* | 3 |
| CHM 230 | Chemistry II 4 |
| MATH 221 | Analytic Geometry and Calculus II 4 |
| ECON 110 | Economics I 3 |
| Humanities or social science elective | 3 |
| | 17 |

*English Composition II is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I.

Pre-engineering or transfer students

Many of the fundamental courses required for a degree in engineering may be obtained through pre-engineering programs at other four-year institutions or at community colleges. In general, two years of course work will be transferable. However, there are differences among the curricula; students electing this route should work closely with their advisors and KSU to ensure a proper selection of courses. Questions should be referred to the dean's office, College of Engineering.

The following chart indicates the number of transferable credit hours for various courses, and is a guide to courses which current Kansas State University students will be taking.

Students transferring at the junior level may find it advantageous to attend the summer session preceding fall enrollment.

Basic pre-engineering subjects

| | Use in various curricula; credit hours at KSU | | | | | | | | | |
|--|---|-----|----|-----|-----|------|----|----|----|----|
| | AGE | ARE | CE | CHE | CNS | EECE | ET | IE | ME | NE |
| Accounting | * | | | | 3 | * | * | 3 | | |
| Biology | 4 | | | * | | * | | | | * |
| Chemistry | 8 | 8 | 8 | 8 | * | 8 | 4 | 8 | 8 | 8 |
| Computer programming† | 2 | 3 | 2 | 1 | 3 | 3 | 2 | 2 | 2 | 2 |
| Economics | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| English Composition I and II** | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Geology | | | 3 | * | 3 | | | | | * |
| Graphics | 2 | 4 | 2 | * | 4 | * | 2 | 2 | 5 | * |
| Mathematics (Analytic Geometry and Calculus and Elementary Differential Equations) | 16 | 16 | 16 | 16 | 4 | 16 | 6 | 16 | 16 | 16 |
| Mathematics (algebra and trigonometry) | | | | | | | 6 | | | |
| Organic chemistry | | | | 8 | | | | | | * |
| Physics | 10 | 10 | 10 | 10 | 8 | 10 | 8 | 10 | 10 | 10 |
| Qualitative analysis | | | * | 4 | | | | | | * |
| Social science/humanities electives†† | 13 | 12 | 13 | 15 | 12 | 15 | 12 | 13 | 15 | 13 |
| Speech (public speaking) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| Statics | 3 | 3 | 3 | * | 3 | 3 | * | 3 | 3 | 3 |
| Statistics (calculus-based)††† | * | * | * | | | 3 | 3 | 3 | * | |

***Elective**
 Excess credit hours in courses listed above may possibly be used in elective areas after consultation with a KSU departmental advisor and the dean's office.

**English Composition II is required for ET, but optional for all other programs if an A or B grade is achieved in English Composition I.

†FORTRAN

††Two courses must be junior/senior level (not available at two-year schools)

†††ET need not be calculus-based

Engineering subjects that normally are offered during the summer include:

| | | |
|----------|--|---|
| CE 333 | Statics | 3 |
| EECE 241 | Introduction to Computer Engineering | 3 |
| EECE 510 | Circuit Theory I | 3 |
| NE 385 | Engineering Computational Techniques | 2 |
| ME 512 | Dynamics | 3 |
| ME 513 | Thermodynamics I | 3 |
| ME 571 | Fluid Mechanics | 3 |

Engineering sciences

Engineering sciences apply science and mathematics to the basic engineering areas. Students pursuing a B.S. degree in engineering must satisfy the following requirements:

A minimum of 32 semester hours of engineering science courses.

At least 9 semester hours of engineering science courses outside the student's major department.

At least four of the six subject areas in the following list must be represented in the 32 semester hours.

Engineering materials

| | | |
|----------|-------------------------------------|---|
| CHE 350 | Engineering Materials | 2 |
| CHE 352 | Engineering Materials | 3 |
| NE 515 | Nuclear Engineering Materials | 2 |
| EECE 695 | Solid State Engineering | 3 |

Analytical mechanics

| | | |
|--------|----------------------------|---|
| CE 333 | Either | 3 |
| | Statics | |
| ME 512 | and | 3 |
| | Dynamics | |
| CE 530 | or | 4 |
| | Statics and Dynamics | |

Circuits, fields, and electronics

| | | |
|----------|---|---|
| EECE 510 | Circuit Theory I | 3 |
| EECE 519 | Electrical Circuits and Controls | 4 |
| EECE 557 | Electromagnetic Theory | 4 |
| EECE 632 | Engineering Applications of Microcomputer Systems | 3 |

Thermodynamics

| | | |
|---------|------------------------|---|
| CHE 515 | Chemical Engineering | 2 |
| | Thermodynamics I | |
| ME 513 | Thermodynamics | 3 |

Flow and rate processes

| | | |
|---------|-----------------------------|---|
| ME 571 | Fluid Mechanics | 3 |
| CHE 530 | Transport Phenomena I | 3 |

Computing and information sciences

Note: It should be recognized that there are other courses in these subject areas which may properly be considered as belonging to engineering sciences. In addition, there are areas of engineering science which are not listed.

Humanities and social science electives

To add breadth to education and to help prepare for a more effective role in society each engineering student is required to take several courses in the social sciences and humanities. The following list of electives has been approved by the faculty.

Architecture and design—any course in history or appreciation of architecture

Art—any course

Economics—any course above ECON 110

Engineering—DEN 450, Impact of Technology on Society (3)

DEN 299, Honors Seminar in Engineering (2)

DEN 399, Honors Colloquium in Engineering (1)

English—any course above ENGL 205 except ENGL 415 and ENGL 516

Geography—any course except GEOG 220, 221, 700, 702, and 705

History—any course

Journalism—JMC 235, Introduction to Mass Communications (3)

Modern languages—any course except English or the student's native language

Music—any course; Music Listening Lab must be the two-credit-hour course

Philosophy—any course except PHILO 110, PHILO 220, and PHIL 510

Political science—any course

Psychology—any course

Sociology and anthropology—any course

From the areas listed above at least two advanced level courses must be taken.

These are normally 400 level or above, except for modern languages where the third and following courses in a sequence are considered advanced level. Not more than 3 credit hours may be taken in applied music and/or applied art. All courses must be taken for a letter grade.

Grade requirements

Before attempting a course taught in the College of Engineering, a grade of "C" or better must be earned in any courses which are prerequisite to it.

Summer school

Many of the courses appearing in the engineering curricula, not only those which are offered in the College of Engineering but also those in the College of Arts and Sciences, may be taken during the summer term.

High school seniors who have had insufficient mathematics to enroll in MATH 220, Analytic Geometry and Calculus I are urged to investigate the possibility of summer school to remove this mathematics deficiency. MATH 125, College Algebra and Trigonometry and MATH 150, Plane Trigonometry are offered during the summer sessions and provide an excellent transition from high school mathematics into the engineering curriculum.

Information concerning the courses offered is contained in the summer school catalog, which may be obtained from the Division of Continuing Education. The summer school catalog is published in early spring for the coming summer.

International student admission

Applications for admission of international students are judged by several factors, including, but not limited to: secondary school record, test scores, academic record at the college and university level, trend in

grades, and grades in mathematics, physical sciences, and related areas.

Because of a limitation on the number of international students that can be accommodated, the College of Engineering reserves the right to apply more rigorous admissions criteria to applicants who are not U.S. citizens.

Program Options

Interdisciplinary studies

Although engineering curricula are generally structured, it is possible to pursue a secondary field of interest through the judicious selection of electives. If added flexibility is needed to pursue specific goals, the student may petition the advisor and department head for the substitution of required courses. Some of the more popular secondary areas are:

Business administration

Increasing numbers of engineers are assuming managerial positions in all phases of industrial operations. Some of the courses listed in the section of dual degrees could be appropriate technical electives for students with goals in management.

Pre-medicine

Many of the recent advances in medical research techniques, patient monitoring systems, artificial limbs and organs, and aerospace and undersea medicine have been developed from the partnership of medicine and engineering. Engineering students wishing to satisfy entrance requirements to a typical school of medicine must take chemical analysis, two semesters of organic chemistry, and two semesters of biology (BIOL 198 plus one of the following: BIOL 201, 535, or 650). The pre-medicine advisor in the College of Arts and Sciences should be consulted prior to the junior year.

Pre-law

A graduate degree in law can be desirable for engineers wishing to pursue careers in industrial management or patent law. While there are no specific courses required for entry to law school, appropriate elective areas are economics, political science, history, sociology, psychology, anthropology, accounting, and finance. The pre-law advisor in the College of Arts and Sciences should be consulted prior to the junior year.

Computer science

Modern electronic computers are powerful tools for the solution of complex engineering and/or management problems. An individual with training in both engineering and computer science possesses the background to attack problems over a broad range of areas. Appropriate courses include:

Languages

| | |
|---------|--|
| CIS 200 | Fundamentals of Computer Programming |
| CIS 300 | Algorithms and Data Structures |
| CIS 305 | Computer Organization and Programming IA |
| CIS 505 | Introduction to Programming Languages |

Design

| | |
|----------|--------------------------------------|
| EECE 241 | Introduction to Computer Engineering |
| EECE 444 | Computer Engineering Laboratory I |
| EECE 544 | Computer Engineering Laboratory II |
| EECE 641 | Design of Digital Systems I |

Computational Techniques

| | |
|---------|---|
| CHE 316 | Chemical Engineering Computational Techniques |
| IE 560 | Introduction to Operations Research |
| IE 573 | Industrial Simulation |
| ME 760 | Engineering Analysis I |
| NE 720 | Nuclear Systems Analysis |

Mathematics, physics, and chemistry

Engineering students with interests in research should plan on graduate study. Preparation at the undergraduate (B.S.) level could be enhanced by additional courses in mathematics and the basic sciences. Refer to the departmental listings in the College of Arts and Sciences section for possible electives.

Bioengineering

Bioengineering is a very broad field overlapping the life sciences and many engineering disciplines. Some of the subareas are biomechanics, ergonomics, bioinstrumentation, biomaterials, bioenergetics, water and waste treatment, food engineering, and environmental engineering. In addition to the courses listed in the pre-medicine section, other courses of interest include:

| | |
|----------|---|
| AGE 510 | Environmental Design of Agricultural Buildings |
| AGE 520 | Energy Use and Control in Agricultural Systems |
| AGE 680 | Principles of Occupational Safety and Health Management |
| AGE 700 | Agricultural Process Engineering |
| CHE 715 | Biochemical Engineering |
| CHE 725 | Biotransport Phenomena |
| CE 563 | Environmental Engineering Fundamentals |
| CE 565 | Water and Wastewater Engineering |
| CE 761 | Environmental Engineering Chemistry |
| CE 762 | Water Treatment Systems |
| CE 766 | Wastewater Engineering I: Biological Processes |
| EECE 771 | Control Theory Applied to Bioengineering |
| EECE 772 | Theory and Techniques of Bioinstrumentation |
| EECE 773 | Bioinstrumentation Laboratory |
| IE 551 | Industrial Ergonomics |
| IE 625 | Work Environments |
| ME 622 | Environmental Engineering I |
| ME 722 | Environmental Engineering II |

Food engineering

Engineers are needed in the food industry for process development and design, equipment design, and management of operations. The students should select technical electives to augment a background in chemistry, microbiology, agricultural and food sciences, and process engineering.

Energy systems engineering

The increasing demand for energy is one of the major problems confronting all nations. New energy sources are needed in addition to more effective use of present resources. Interested students should select courses from the following areas: thermodynamics, energy conversion, nuclear reactor technology, electric energy systems, and engineering economics.

Dual degree programs

Students who want to pursue interdisciplinary interests in depth may wish to enroll in a dual degree program. In general, the second degree may be earned with an additional year of study. A minimum of 150 semester hours is required for two B.S. degrees. To receive two bachelor of science degrees from the College of Engineering, a student must take at least 20 hours of course work in each major department. Since there are many possible combinations, questions should be referred to the dean's office. Five programs of interest are listed below:

Engineering and business administration

Ordinarily the program must have begun during the student's sophomore year. Students desiring to pursue this dual degree program should contact the dean's office in the College of Business Administration.

Agricultural engineering and feed science and management

A five-year dual degree program leading to a bachelor of science degree in agricultural engineering and a bachelor of science degree in feed science and management requires 159 credit hours, including the general option requirements for agricultural engineering and 37 hours of courses listed below:

| | | |
|-----------|--|-----------|
| GRSC 100 | Principles of Milling | 3 |
| GRSC 110 | Flow Sheets | 2 |
| STAT 318 | Elements of Statistics | 3 |
| ASI 318 | Fundamentals of Nutrition | 3 |
| GRSC 510 | Feed Technology I | 4 |
| GRSC 750 | Feed Technology II | 4 |
| BIOCH 120 | Introduction to Organic and Biochemistry | 5 |
| GRSC 650 | Concepts of Milling Design | 3 |
| GRSC 661 | Qualities of Feed and Food Ingredients | 3 |
| GRSC 651 | Feed Plant Sanitation | 4 |
| GRSC 785 | Advanced Flour and Feed Technology | 3 |
| | | <u>37</u> |

Eleven of the 37 hours are used to satisfy the technical elective requirement in the general option.

Civil engineering and geology

Students interested in specializing in foundation engineering are advised to complete the B.S. degree requirements in civil engineering plus the requirements listed below to qualify for the B.S. degree in geology:

General requirements for a B.S. degree in arts and sciences (see the College of Arts and Sciences section).

Complete the following courses in geology:

| | | |
|------------------|-----------------------------|-----------|
| GEOL 300 | Historical Geology | 4 |
| GEOL 502 | Mineralogy | 3 |
| GEOL 503 | Petrology | 3 |
| GEOL 520 | Geomorphology | 2 |
| GEOL 530 | Structural Geology | 3 |
| GEOL 630 | Stratigraphic-Sedimentation | 4 |
| GEOL 680 | Field Geology | 6 |
| Geology elective | | <u>5</u> |
| | | <u>30</u> |

Chemistry and chemical engineering

In addition to the required courses in chemical engineering, interested students should take:

| | | |
|-----------|---------------------------|-----------|
| CHM 551 | Organic Chemistry II Lab | 2 |
| CHM 597 | Structure and Bonding | 2 |
| CHM 545 | Chemical Separations | 2 |
| CHM 666 | Instrumental Analysis | 3 |
| CHM 499 | Undergraduate Research | 3 |
| MLANG 121 | German I | 4 |
| MLANG 122 | German II | 4 |
| CHM 667 | Instrumental Analysis Lab | 1 |
| | | <u>21</u> |

Electives should be chosen to satisfy the humanities and social sciences requirements and the engineering science requirements listed earlier in the College of Engineering section.

Architecture and architectural engineering

For those students enrolled in the Department of Architectural Engineering and Construction Science, there is an opportunity to undertake a dual major with the curriculum of architecture. Interested students should consult with their advisors.

Integrated master's degree program

A five-year integrated program leading to a B.S. degree in any of the fields of engineering at the end of four years and a master of science degree at the end of five years is available for promising undergraduate students. In architectural engineering, the comparable numbers would be five and six years.

Students who have completed the sophomore year and have outstanding scholastic records are invited to join the program. Each student, in consultation with a faculty advisor, will plan an individualized program of study which meets requirements for the B.S. and M.S. degrees. Features of the program include integrated planning, participation in research as an undergraduate, and enrollment in graduate-level courses in the senior year. Students participating in the program will be considered for financial assistance in the form of scholarships, fellowships, research assistantships, and part-time work.

Engineering honors program

The honors program in the College of Engineering offers interested students intellectual challenges consistent with their abilities and interests. Entering engineering freshmen with high school averages or American College Testing Program composite scores within the top five percent will be invited to join the program. Transfer students with superior academic records

also are eligible and will be invited to join the honors program. Sophomores and other upperclassmen enrolled in engineering who have not previously qualified for the honors program may, with the endorsement of a member of the engineering faculty and the approval of the engineering college honors committee, join the program.

Participation in the honors program will not alter the time required for graduation for most students and should be a stimulating experience. In addition to enrolling in honors sections in course work, students may enroll in a variety of seminars, colloquia, and research problems designed to enrich and challenge them. The honors program in engineering is closely integrated with the honors programs of the other colleges at KSU and provides an excellent opportunity for interdisciplinary study. A student in the honors program may elect to withdraw from the program at any time.

Cooperative education program

The College of Engineering, through its cooperative education program, offers students in engineering an opportunity to obtain experience in industry as an integral part of their formal education. After completion of the freshman year, engineering students alternate sessions of work and study taking three years (five work periods) to complete the sophomore and junior academic program. In this tandem arrangement, one student is a full-time employee in industry, while the other studies in a chosen professional engineering field.

While the program extends the time required to earn a degree by one year, the student may obtain as much as 20 months of experience and earn a significant portion of college expenses. Participants are selected from students who are progressing satisfactorily toward a degree and have completed at least one semester in the chosen curriculum. Applications for the program are accepted any time after the student is enrolled in the College of Engineering and final selection is made through formal employment interviews with the participating companies.

Support Services

Center for Effective Teaching

The College of Engineering Center for Effective Teaching is organized to further the college's goal of excellence in teaching. The center sponsors several programs to enhance teaching, including specialized training for young engineering educators, seminars in educational methods and techniques for all engineering faculty, student evaluation of undergraduate teaching, and monetary awards for excellence in teaching. The center is funded

by private endowment and also helps in the financing of specialized teaching aids, teaching reference materials, and educational research.

The center's activities are coordinated by an advisory committee of students and faculty from the College of Engineering.

Engineering Experiment Station

Gale G. Simons, Associate Dean for Research and Director

The College of Engineering is committed to the concept that good teaching and good research complement each other to the benefit of the student, the public, and the faculty member himself or herself. The Experiment Station is the division of the college responsible for the administration of research.

The research faculty of the Experiment Station is composed of members of all departments of the College of Engineering. Researchers from the Engineering Experiment Station work closely with those from the Agricultural Experiment Station and with others from within the University on projects of mutual concern.

The activities of the Engineering Experiment Station are funded by state appropriations and by grants and contracts from governmental agencies and private industries. The annual research budget is more than \$8 million, with approximately 25 percent appropriated by the state and the remainder from other sources. Research now being carried on includes:

- Hydrogen fuel research
- Solar energy applications
- Wind energy studies
- Fermentation systems
- Fluidized bed technology
- Signal processing
- Gasification of biomass
- Transportation
- Buckling behavior of concrete shells
- Image enhancement
- Bioengineering
- Optimizing for comfort and energy use
- Human physiological responses to thermal stresses
- Manufacturing
- Energy conservation
- Heat transfer augmentation during two-phase flow
- The effect of room and control systems dynamics on energy consumption
- Combustion kinetics
- Radiation dosimetry
- Robotics
- Hazardous substances
- Lighting
- Artificial intelligence
- Water resources and quality
- Electrical power

Institute for Environmental Research

Byron W. Jones, Director
Elizabeth A. McCullough, Associate Director

The institute for Environmental Research serves as a focal point for interdisciplinary research on thermal environmental engineering and the thermal interaction between people and their thermal environment.

The institute is administered by the College of Engineering and research is administered through the Engineering Experiment Station. It works in cooperation with a number of academic departments from throughout the University. Faculty and students from these departments participate in the institute's research programs, use the facilities for their own research, and utilize the facilities for specialized graduate courses and seminars. Research funding is primarily from contracts with private companies and government agencies.

Research facilities are available for controlling and measuring thermal environmental parameters over a range of conditions, for measuring thermal characteristics of clothing, and for measuring human physiological variables.

Major facilities include:

Environmental chambers ranging in size from 40 to 280 square feet and with operating temperatures ranging from -15 to 150 degrees F.

Thermal manikins for measuring clothing insulation. One is thermally segmented and movable. One is capable of operating under simulated sweating conditions.

Hot plates for measuring the thermal resistance of fabric or insulation systems. One is equipped with a wetting device to allow simultaneous heat and moisture transfer.

Infrared thermal imaging system for measuring human body, clothing, or building surface temperature profiles.

Center for Hazardous Substance Research

Larry E. Erickson, Director

In 1989 the University received Board of Regents approval to establish a Center for Hazardous Substance Research and a grant from the U.S. Environmental Protection Agency to establish a Hazardous Substance Research Center for U.S. EPA Regions 7 and 8 with its headquarters at K.S.U.

The center provides a focal point for research and research communication. Specific goals and objectives are to:

- (1) provide leadership and foster the conduct of hazardous substance research,
- (2) have a point of contact for industrial

and governmental officials with hazardous waste research concerns, (3) develop a professional staff of faculty members who can conduct contract and grant research for industry and government, (4) maintain a safe and proper environment for the conduct of hazardous and toxic substance research, (5) furnish well-equipped laboratories for hazardous substance research, (6) generate opportunities for research training of students in the area of hazardous substance research, and (7) enhance the climate for economic development in Kansas for the waste processing industry.

Institute for Systems Design and Optimization

L. T. Fan, Director

The Institute for Systems Design and Optimization, which promotes interdisciplinary research, teaching, and communications in systems engineering, was approved in 1967 by the Kansas Board of Regents.

The institute is administered through the College of Engineering and the Engineering Experiment Station and provides channels of communication between disciplines throughout the University in engineering systems design.

Specific objectives of the institute include the promotion of interdisciplinary research; the development of opportunities for interdisciplinary communication in systems engineering through seminars and conferences; preparation of research proposals; and providing assistance in recruitment of graduate students, post-doctoral students, and faculty in systems design.

Center for Energy Studies

N. Dean Eckhoff, Director

The goal of the center is to conduct interdisciplinary studies and to provide leadership training in the planning, design, and operation of fuel production processes, power generation, and transportation and utilization systems, and in policy matters involving the management of energy resources.

The center carries out basic as well as mission-oriented interdisciplinary studies on problems related to energy resources and power production, disseminates the results of these studies through seminars and publication of reports, and provides information to students and personnel from government and industry to upgrade their professional competence.

Center of Excellence for Research in Computer Controlled Automation

John M. Ulrich, Acting Director

The goal of the center is to provide high technology research to help industry expand services, manufacture new prod-

ucts, and increase productivity. It promotes cooperative research between the University and private companies engaged in development and use of high technology.

Although the center is in the College of Engineering, other disciplines outside the college are involved in cooperative research with industrial partners.

Forming the nucleus of the center are faculty from the Departments of Mechanical Engineering, Electrical and Computer Engineering, Chemical Engineering, Nuclear Engineering, Agricultural Engineering, and Civil Engineering. As more projects are identified, faculty from departments outside of engineering will participate.

The focus of the center is the use and study of computers, robotics, artificial intelligence, numerically controlled machines, flexible manufacturing systems, and instrumentation in the sensing, controlling, communicating, and decision-making processes in engineering design and manufacturing.

Office of Radiation Protection Research and Information

Gale G. Simons, Director

The Office of Radiation Protection Research was established to promote and advance the progress of radiation-protection engineering. Major areas of emphasis encompass both basic and applied research as well as public information.

To meet the general criteria for selection as a research project, the scope of investigation must feature at least one of the following topics and must address issues of public health and welfare or economic impact: (1) radioactive materials that occur naturally in our environment, (2) radionuclides produced artificially, and (3) machines and instruments that either produce radionuclides or emit radiation during their operation.

The mission of the office is to serve the citizens of Kansas and the nation by making the facilities and faculty expertise of the college accessible and by transferring technology that will improve the environment, economy, and people's lives.

Center for Transportation Research and Training

Bob L. Smith, Director

The center's goal is to conduct interdisciplinary research and training in the planning, design, and operation of rural and urban transportation systems.

The center carries out interdisciplinary mission-oriented research concerning national, regional, state, and local transportation problems; disseminates the results of research through publication of

reports and seminars for university, industry, and government representatives to assure that the results can and will be applied to the solution of practical transportation problems; and provides training to students and personnel from the transportation community to upgrade their professional competence.

In performing the stated missions of the center, systems analysis and synthesis techniques will be emphasized, and the safety, aesthetic, and environmental aspects of transportation systems will not be neglected.

Institute for Computational Research in Engineering

H. S. Walker, Co-Director

R. G. Aiken, Co-Director

The institute promotes engineering research, development, and service for computer-oriented activities. The interdisciplinary aspects of these activities are stressed with emphasis upon simulation by computer modeling.

The institute is administered through the College of Engineering and provides a University-wide center for information concerning computational engineering. Other functions of the institute include the preparation of research proposals; the dissemination of information through conferences, workshops, and reports; and the encouragement of creative uses of computers.

Nuclear Reactor Facility

Richard E. Faw, Director

Kansas State University has a TRIGA Mark II pulsing nuclear reactor and a well-equipped neutron activation analysis laboratory within its Department of Nuclear Engineering. The reactor, which is licensed for steady-state operation to 250 kilowatts and pulsed operation to 250 megawatts, is used for teaching and research by many departments. The reactor is used in part for radiation effects studies and for neutron activation analysis, an analytical technique which is essentially nondestructive and offers sensitivities better than one part per billion for some elements. Neutron activation analysis finds application in diverse fields such as diagnostic medicine, plant improvement studies, nutrition studies, age dating of geological specimens, forensics, toxicology, and metabolic studies.

Kansas Industrial Extension Service

Richard B. Hayter, Director

The Kansas Industrial Extension Service (KIES) uses the facilities of the College of Engineering to assist Kansas industries. Functions of the KIES include direct technical assistance, preparation and distribution of special publications, and

continuing education. Farrell Library on the KSU campus, Linda Hall Library in Kansas City, various computer information retrieval systems, and other informational sources can be used. The laboratory and computer facilities and the faculty of the college can also be used to provide answers to technical questions.

Short courses, conferences, seminars, and workshops are arranged to provide continuing education for technical people, including practicing engineering and manufacturing personnel. Specialized courses can be developed in response to a request by any Kansas industry.

To use the service, write or call Kansas Industrial Extension Service, 133 Ward Hall, Kansas State University, Manhattan, Kansas 66506-2508, (913) 532-6026.

Kansas Energy Extension Service

Richard B. Hayter, Director

The Kansas Energy Extension Service (KEES) is a technical assistance program for small energy consumers ranging from residential to small business and industry. The KEES is a program of the Kansas Energy Office operated through Kansas State University with assistance from the other Regents' institutions. It is a joint effort of the College of Engineering and the Cooperative Extension Service.

The technical outreach of the KEES is directed toward four program areas: residential, agricultural, institutional, and small business and industry. Assistance is offered through short courses, technical publications, and direct responses to inquiries including on-site visits. Recommendations for reducing energy consumption and assistance with alternate energy systems are offered.

Inquiries should be directed to the Kansas Energy Extension Service, 133 Ward Hall, Kansas State University, Manhattan, Kansas 66506-2508, (913) 532-6026.

College of Engineering Research Council

Donald E. Rathbone, Governor
Gale G. Simons, Director

The College of Engineering Research Council (CERC) is a quasiprivate organization developed under the KSU Research Foundation. The council serves mainly College of Engineering researchers.

It is an organization, essentially parallel to the Engineering Experiment Station, which handles proposals or projects that have an industrial involvement.

Many of the proposals or projects are interdisciplinary, conducted either within the college or between the college and other colleges and departments at Kansas State University.

Certain elasticities have been built into the organization to better handle industrial contracts. These tractable areas include flexibility in contract negotiations (patents, proprietary information, etc.), expanded faculty salary potential, and simplified procurement procedures.

General Engineering

Donald E. Rathbone, Dean

Undergraduate credit

DEN 160. Engineering Concepts. (2) I, II. An introduction to engineering and engineering design. Problems involving the basic concepts of engineering science are considered. Two class periods a week. Pr.: Two high school units of algebra, one high school unit of geometry, and one-half high school unit of trigonometry. DEN-160-1-0901

DEN 200. Kansas State Engineer Journalism. (1-2) I, II. Editorial and business staff work on the *Kansas State Engineer*. Pr.: Junior classification and consent of dean. DEN-200-2-0901

DEN 201. Amateur Radio Theory I. (1) I. Theory and practice of amateur ("ham") radio operation. Basics of radio electronics, antennas, FCC regulations, Morse code; successful completion of the course should ensure passing the FCC Novice class examination. Credit may not be applied toward an engineering degree. One hour rec. and one hour Morse code lab a week. DEN-201-0-0901

DEN 202. Amateur Radio Theory II. (1) II. Theory and practice of amateur ("ham") radio operation. More basics of radio electronics, antennas, FCC regulations, Morse code; successful completion of the course should ensure passing the FCC General class examination. Credit may not be applied toward an engineering degree. One hour rec. and one hour Morse code lab a week. Pr.: DEN 201 or FCC Novice class license. DEN-202-0-0901

DEN 299. Honors Seminar in Engineering. (1) I, II. Selected topics of general interest. May be taken twice for credit by engineering honor students starting in the second semester of the freshmen year. DEN-299-0-0901

DEN 380. Principles of Solar Energy Conversion and Utilization. (3) I. Solar radiation; solar collectors; engineering principles of solar house space heating, cooling, and water heating; conversion of solar energy into mechanical power and electricity; solar engines; application of solar energy in industrial processes; calculations of efficiency of solar energy conversion processes; cost analysis of various solar applications. Three hours rec. a week. Pr.: PHYS 113. DEN-380-0-0910

DEN 399. Honors Colloquium in Engineering. (1) II. Selected topics of general interest. Open to students in the engineering honors program for one semester. DEN-399-0-0901

DEN 400. Career Management for Engineers. (1) I, II. A seminar course which considers the basic factors in professional career management; career paths and strategies; important factors for success. One hour rec. a week. Pr.: Junior or senior standing in the College of Engineering. DEN-400-0-0901

DEN 420. Introduction to Alternative Energy Sources. (3) II. Introduction to solar, geothermal, wind, tidal, thermal sea gradients, breeder reactor, and fusion energy sources. Concepts, devices, potential, economics, and status of each energy source. Introduction to the all-electric economy. Three hours rec. a week. Open to all nonengineering and first- and second-year engineering students. DEN-420-0-0901

DEN 425. Introduction to Energy and Environmental Technology. (2) I, II. An introductory course for nonengineering students. An introduction to the technology employed in analyzing energy and pollution control processes. The course emphasizes energy problems, control of water and air pollution, food and land use problems, and material recycling concepts. Not open to engineering students. Two hours lec. a week. DEN-425-0-0901

DEN 450. Impact of Technology on Society. (3) I, II. A study of social, economic, and environmental problems as a function of technology. Study of effect of various significant technological developments on present society and parallels with present developments. Study of current problems, detection of causes, and analysis of solutions. Implications for the future; governmental, industrial, and individual responsibility in detection of potential problems and methods of control or solution. Three hours rec. a week. DEN-450-0-0901

DEN 499. Honors Research in Engineering. (1) I, II. Individual research problem selected with approval of faculty advisor. Open to seniors in the engineering honors program for two semesters. Written report is presented at end of second semester. DEN-499-4-0901

DEN 550. Engineering Law. (3) I, II. An introduction to concepts of law pertinent to engineering practice. These include contracts, torts, products liability, business associations, engineering licensing, real and personal property law, commercial law, and taxes. Three hours rec. a week. Pr.: Junior standing. DEN-550-0-0901

DEN 740. Applied Linear Analysis. (3) I. The application of linear analysis to engineering problems, including derivations of equations, exact and approximate solutions of systems representable by matrix algebraic, differential, and integral equations. Concepts of characteristic, impedance, transfer, and influence functions. Three hours rec. a week. Pr.: MATH 240. DEN-740-0-0901

Agricultural Engineering

Stanley J. Clark, Head

Professors Chung,* Clark,* Manges,* Murphy,* Spillman,* and Steichen;* Associate Professors Baugher, Black, Harner,* Heber,* Kuhlman,* Powell, Rogers, Schrock,* Slocombe,* TenEyck, and Thierstein; Assistant Professors Barnes and Taylor; Adjunct Professor Steele;* Adjunct Associate Professors Chang,* Converse, Hagent, and Cole; Adjunct Assistant Professors Martin and Wagner; Emeriti: Professors Fairbanks, Holmes, Jepsen, Larson, Stover, and Wendling; Associate Professors Schindler and Stevenson.

Undergraduate study

Agricultural engineering is the field that applies engineering science and technology to the food production and agricultural industry. Students completing this program are prepared to develop new methods as well as to further the application of engineering fundamentals in such areas as agricultural machinery; soil and water conservation; irrigation and drainage; energy systems; plant and animal environment; and feed or waste handling, processing, and storage. Due to the broad scope of

agricultural engineering, two curriculum options are available.

General option with area of specialization

The general curriculum outlined for agricultural engineering provides the basic requirements for the program. The 12 hours of technical electives in the junior and senior years allow the student to specialize in the technical areas of agricultural engineering. These areas are power and machinery, grain handling and processing, soil and water, and structures and environment. Choice of a specific specialty is not required. Lists of approved technical electives for each specialty are available from the agricultural engineering office.

Food engineering option

A student pursuing the option of food engineering within the Department of Agricultural Engineering can fulfill the requirements for a B.S. in agricultural engineering by following the food engineering option outline. Inherent in this program is the basic background of agricultural engineering with emphasis in food preparation, processing, and storage.

Agricultural technology management

Description and curriculum outline are listed in the catalog under the College of Agriculture, Agricultural Technology Management curriculum.

Graduate study

Major work leading to the master of science and doctor of philosophy degrees is offered in power and machinery, soil and water engineering, animal environment and waste management, food and feed processing, and energy use in agriculture.

Excellent opportunities and capabilities exist for advanced study. In addition to modern departmental facilities, irrigation experimental fields, the USDA Grain Marketing Research Center, and the USDA Wind Erosion lab offer unique possibilities for graduate research.

Curriculum in agricultural engineering (AGE)

Bachelor of science in agricultural engineering
135 hours required for graduation
Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology

General option

Freshman

| | | |
|--|---|----------|
| Fall semester | | |
| ENGL 100 | English Composition 1 | 3 |
| CHM 210 | Chemistry I | 4 |
| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
| AGE 200 | Agricultural Engineering Analysis I | 1 |
| SPCH 105 | Public Speaking IA | 2 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| Humanities or social science electives | ..... | 3 |
| | | <hr/> 17 |

Spring semester

| | | |
|----------|--|----------|
| ENGL 120 | English Composition II* | 3 |
| or | | |
| Elective | ..... | 3 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| ECON 110 | Economics I | 3 |
| CHM 230 | Chemistry II | 4 |
| AGE 220 | Agricultural Engineering Analysis II | 1 |
| ME 212 | Engineering Graphics 1 | 2 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 17 |

Sophomore

Fall Semester

| | | |
|--|--|----------|
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| PHYS 213 | Engineering Physics I | 5 |
| BIOL 198 | Principles of Biology | 4 |
| PE 101 | Principles of Physical Fitness | 1 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| Humanities or social science electives | ..... | 3 |
| | | <hr/> 17 |

Spring semester

| | | |
|----------|---|----------|
| MATH 240 | Elementary Differential Equations | 4 |
| PHYS 214 | Engineering Physics II | 5 |
| AGE 500 | Properties of Biological Materials .. | 2 |
| AGE 320 | Agricultural Engineering Analysis III | 1 |
| CE 333 | Statics | 3 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 15 |

Junior

Fall semester

| | | |
|-----------|--|----------|
| AGE 510 | Environmental Design of Agricultural Buildings | 3 |
| ME 513 | Thermodynamics I | 3 |
| ME 512 | Dynamics | 3 |
| CE 533 | Mechanics of Materials | 3 |
| CE 534 | Mechanics of Materials Lab | 1 |
| AGRON 305 | Soils | 4 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 17 |

Spring semester

| | | |
|----------|--|----------|
| AGE 512 | Functional Analysis of Agricultural Machinery | 3 |
| AGE 566 | Design of Agricultural Structures .. | 3 |
| AGE 520 | Energy Use and Control in Agricultural Systems | 3 |
| AGE 551 | Hydrology | 2 |
| ME 571 | Fluid Mechanics | 3 |
| ENGL 415 | Written Communications for Engineers | 3 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 17 |

Senior

Fall semester

| | | |
|--|--|----------|
| AGE 536 | Agricultural Engineering Design I .. | 3 |
| AGE 575 | Fundamentals of Agricultural Process Engineering | 3 |
| EECE 510 | Circuit Theory I | 3 |
| Humanities or social science electives | ..... | 3 |
| Technical electives | ..... | 6 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 18 |

Spring semester

| | | |
|--|---|----------|
| AGE 530 | Soil and Water Engineering | 3 |
| AGE 581 | Professional Practice in Agricultural Engineering | 1 |
| Humanities or social science electives | ..... | 4 |
| Technical electives | ..... | 9 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 17 |

*English Composition 11 is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I. Elective is restricted to technical elective, humanities or social science elective, or ROTC.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum (two courses must be 400 level or above).

Technical electives are to be chosen with the advice and approval of the faculty advisor and department head.

The engineering science requirements will be satisfied by the required courses in this curriculum.

Food engineering option

Freshman

Fall semester

| | | |
|---------------------------------------|---|----------|
| ENGL 100 | English Composition 1 | 3 |
| CHM 210 | Chemistry I | 4 |
| MATH 220 | Analytic Geometry and Calculus 1 .. | 4 |
| AGE 200 | Agricultural Engineering Analysis I | 1 |
| SPCH 105 | Public Speaking IA | 2 |
| Humanities or social science elective | ..... | 3 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 17 |

Spring semester

| | | |
|----------|--|----------|
| ENGL 120 | English Composition II* | 3 |
| or | | |
| Elective | ..... | 3 |
| CHM 230 | Chemistry II | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| ECON 110 | Economics I | 3 |
| AGE 220 | Agricultural Engineering Analysis II | 1 |
| PE 101 | Principles of Physical Fitness | 1 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 16 |

Sophomore

Fall semester

| | | |
|----------|--|----------|
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| PHYS 213 | Engineering Physics I | 5 |
| BIOL 198 | Principles of Biology | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 16 |

Spring semester

| | | |
|----------|---|----------|
| MATH 240 | Elementary Differential Equations | 4 |
| PHYS 214 | Engineering Physics II | 5 |
| CE 530 | Statics and Dynamics | 4 |
| CHE 314 | Introduction to Process Analysis .. | 3 |
| AGE 320 | Agricultural Engineering Analysis III | 1 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 17 |

Junior

Fall semester

| | | |
|--------------------|--|----------|
| CHE 520 | Chemical Engineering Thermodynamics I | 2 |
| BIOL 455 | General Microbiology | 4 |
| CHM 585 | Physical Chemistry I | 3 |
| BIOCH 521 | General Biochemistry | 3 |
| AGE 575 | Fundamentals of Agricultural Process Engineering | 3 |
| Technical elective | ..... | 1 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | <hr/> 16 |

Spring semester

| | | |
|---------|--|-----------|
| CHE 521 | Chemical Engineering Thermodynamics II | 3 |
| ME 571 | Fluid Mechanics | 3 |
| AGE 512 | Functional Analysis of Agricultural Machinery | 3 |
| AGE 500 | Properties of Biological Materials .. | 2 |
| AGE 625 | Thermal Processing Operations in Food Engineering | 2 |
| ASI 411 | Introduction to Food Chemistry | 3 |
| AGE 630 | Food Process Engineering Lab | 1 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | 17 |

Senior**Fall semester**

| | | |
|--|---|-----------|
| EECE 510 | Circuit Theory I | 3 |
| ENGL 415 | Written Communication for Engineers | 3 |
| CHE 550 | Chemical Reaction Engineering | 3 |
| AGE 510 | Environmental Design of Agricultural Buildings | 3 |
| AGE 536 | Agricultural Engineering Design I | 3 |
| Humanities or social science electives | ..... | 3 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | 18 |

Spring semester

| | | |
|---------------------------------------|---|-----------|
| AGE 520 | Energy Use and Control in Agricultural Systems | 3 |
| AGE 635 | Food Plant Design | 3 |
| AGE 581 | Professional Practice | 1 |
| CHE 626 | Bioseparation | 2 |
| Design technical elective | ..... | 2 |
| Humanities or social science elective | ..... | 7 |
| AGE 020 | Agricultural Engineering Assembly | 0 |
| | | 18 |

*English Composition II is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I. Elective is restricted to technical elective, humanities or social science elective, or ROTC.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum (two courses must be 400 level or above).

Technical electives are to be chosen with the advice and approval of the faculty advisor and department head.

The engineering science requirements will be satisfied by the required courses in this curriculum.

Courses in agricultural engineering**Undergraduate credit**

AGE 020. Agricultural Engineering Assembly. (0) I, II. Presentation of professional problems and practices by students, faculty, and professionals associated with the career of agricultural engineering. One hour lec. a month. AGE-020-0-0903

AGE 200. Agricultural Engineering Analysis I. (1) I. Engineering approach to problem solving, computer use in agricultural engineering, solving and plotting calculus problems on the computer, differential leveling, and topographic mapping. Three hours lab a week. Pr. or conc.: MATH 220. AGE-200-1-0903

AGE 220. Agricultural Engineering Analysis II. (1) II. Mathematical modeling for engineering analysis; concepts of systems, control space, and computer applications in agricultural engineering. Three hours lab a week. Pr.: AGE 200. Pr. or conc.: MATH 221. AGE-220-1-0903

AGE 320. Agricultural Engineering Analysis III. (1) II. Solving and plotting solutions of differential equations with agricultural engineering applications. Introduction to computer-aided graphics and design. Three hours lab a week. Pr.: AGE 220. Pr. or conc.: MATH 240. AGE-320-1-0903

AGE 499. Honors Research in Agricultural Engineering. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. AGE-499-4-0903

Undergraduate and graduate credit in minor field

AGE 500. Properties of Biological Materials. (2) II. Characterization of biological material properties that affect the design and analysis of material handling equipment and processes. Physical, electrical, thermal, mechanical, aerodynamic, hygroscopic, and rheological properties of grain and other agricultural products will be examined. One hour rec. and three hours lab a week. Pr.: PHYS 213. AGE-500-1-0903

AGE 510. Environmental Design of Agricultural Buildings. (3) I. Theory and application of psychrometrics, air dilution, and heat and mass transfer; study of animal's interaction with its environment; computer-aided design and analysis of environmental control systems for plants and animals. Two hours rec. and three hours lab a week. Pr.: AGE 320 or IE 372. Pr. or conc.: ME 513. AGE-510-1-0903

AGE 512. Functional Analysis of Agricultural Machinery. (3) II. Kinematics, power transmission, and basic hydraulics as applied to tillage, planting, and harvest machinery. Two hours rec. and three hours lab a week. Pr.: ME 512. AGE-512-1-0903

AGE 520. Energy Use and Control in Agricultural Systems. (3) II. Energy and material balances, process analysis and efficiency, fuel properties, electric motor and engine performance measurement, alternative energy sources, and energy system analysis. Two hours rec. and three hours lab a week. Pr. or conc.: ME 513. AGE-520-1-0903

AGE 530. Soil and Water Engineering. (3) II. Principles and measures for controlling storm water runoff and soil erosion; design of water handling structures for land drainage, flood protection, and irrigation; agricultural surveying. Two hours rec. and three hours lab a week. Pr.: AGE 551, AGRON 305; Pr. or conc.: ME 571. AGE-530-1-0903

AGE 536. Agricultural Engineering Design I. (3) I. Analysis and design of agricultural machines and equipment. Two hours rec. and three hours lab a week. Pr.: AGE 512. Pr. or conc.: CE 533. AGE-536-1-0903

AGE 551. Hydrology. (2) I, II. A study of the sources of supply and movement of underground and surface waters. Two hours rec. a week. Pr.: PHYS 113 or 213. Same as CE 551. AGE-551-0-0903

AGE 566. Design of Agricultural Structures. (3) II. Application of statics and strength of materials to the design and analysis of light-frame structures of wood, steel, and concrete; estimation of wind, snow, grain, and soil loads; stress analysis of beams, columns, frames, trusses, and foundations; computer-aided drafting and introduction to finite element analysis. Three hours rec. a week. Pr.: CE 533. AGE-566-0-0903

AGE 575. Fundamentals of Agricultural Process Engineering. (3) I. Application of basic science and engineering fundamentals for the analysis and design of agricultural processes. Two hours rec. and three hours lab a week. Pr. or conc.: CHE 314 or ME 571. AGE-575-1-0903

AGE 581. Professional Practice in Agricultural Engineering. (1) II. Professional attitudes and ethics. Postdegree career planning and social responsibilities. One hour rec. a week. Pr.: Senior standing. AGE-581-0-0903

Undergraduate and graduate credit

AGE 620. Problems in Agricultural Engineering. (Var.) I, II, S. Problems in the design, construction, or application of machinery or power in agriculture, structures, modern conveniences, and rural electrification. Pr.: Approval of instructor. AGE-620-3-0903

AGE 625. Thermal Processing Operations in Food Engineering. (2) II, in odd years. Analysis of thermal processing operations such as dehydration, drying, evaporation, canning, freezing, and freeze drying. Two hours rec. a week. Pr.: CHE 531 or AGE 575. AGE-625-0-0903

AGE 630. Food Process Engineering Laboratory. (1) II, in odd years. Laboratory studies of food processing unit operations and applications with emphasis on heat and mass transfer operations. Three hours lab a week. Pr.: AGE 575 or CHE 531. Pr. or conc.: AGE 625. AGE-630-1-0903

AGE 635. Food Plant Design. (3) II. Synthesis and design of different food processing plants such as cereal, dairy, fruit, and vegetable. Two hours rec. and three hours lab a week. Pr. or conc.: AGE 625. AGE-635-1-0903

AGE 636. Agricultural Engineering Design II. (Var.) II. Fabrication, evaluation, and refinement of a prototype machine or device designed in AGE 536. Pr.: AGE 536. AGE-636-1-0903

AGE 640. Design of Control Systems for Agricultural Machines and Processes. (3) II. Fundamentals of control engineering with primary emphasis on automatic controls for agricultural machinery and processes. Control system analysis and design. Computer-based applications. Two hours of rec. and three hours lab a week. Pr.: EECE 510 or 519 and MATH 240. AGE-640-1-0903

AGE 650. Agricultural Systems Engineering. (2) I. Development of plans and specifications for buildings, equipment, and controls for selected systems of agricultural production. Six hours lab a week. Pr.: AGE 536, 566. AGE-650-1-0903

AGE 680. Principles of Occupational Safety and Health Management. (3) II. Concepts of recognition, evaluation, and control of occupational hazards. Detection and identification of occupational hazards. Emphasis on theory and performance-related practice. Familiarization with specifications, standards, codes, and regulations. Three hours rec. a week. Pr.: IE 501 or MANGT 420. AGE-680-0-0903

AGE 700. Agricultural Process Engineering. (3) II. Theory, equipment, and design techniques in processing agricultural products. Two hours rec. and three hours lab a week. Pr.: AGE 575. AGE-700-1-0903

AGE 705. Irrigation and Drainage. (3) II. Design and operative problems involved in irrigation or drainage of agricultural land. Two hours rec. and three hours lab a week. Pr.: AGE 551 and AGRON 305. Pr. or conc.: ME 571. AGE-705-1-0903

AGE 710. Advanced Farm Power and Machinery. (3) I. Analytical study of design, construction, and operating characteristics of tractors and selected farm machines. Two hours rec. and three hours lab a week. Pr.: AGE 536. AGE-710-1-0903

AGE 780. Measurement Systems. (3) II. Theory and application of measurement systems with emphasis on environments and processes related to soils, plants, and animals. Two hours rec. and three hours lab a week. Pr.: EECE 510 or 519. AGE-780-1-0903

Graduate credit

AGE 810. Research in Agricultural Engineering. (Var.) I, II, S. The laboratories of the University are available for research in all areas of agricultural engineering. The results of such investigation may be incorporated in bulletins of the Agricultural Experiment Station. Pr.: Approval of department head. AGE-810-4-0903

AGE 811. Particle Technology. (3) I. Science and behavior of airborne particles or aerosols. Technology and methods for measuring, controlling, and utilizing aerosols in the agricultural and food industries. Specific topics include basic particle mechanics; principles of particle measurement; particle statistics; electrostatic precipitation; condensation; evaporation; dust generation; and filtration. Two hours rec. and three hours lab a week. Pr.: STAT 703 and PHYS 113 or 213. AGE-811-1-0903

AGE 815. Graduate Seminar in Agricultural Engineering. (1) I, II. Presentation and discussion of research philosophies, procedures, and results. One hour rec. a week. Required of all graduate students in agricultural engineering. Pr.: Graduate standing. AGE-815-0-0903

AGE 820. Topics In Agricultural Engineering. (Var.) On sufficient demand. A course reserved for study of current topics in agricultural engineering. Topics announced when offered. May be repeated up to a maximum of 9 credit hours. Pr.: Nine credit hours of graduate courses. AGE-820-3-0903

AGE 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. AGE-898-4-0903

AGE 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. AGE-899-4-0903

AGE 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. AGE-999-4-0903

Architectural Engineering/Construction Science

Robert E. Dahl, Head

Professors Bissey,* Burton,* Dahl,* Hodges,* Mingle,* and Jones;* Associate Professors Goddard, Knostman,* and Hayter;* Assistant Professors Goodman, Mayo, and Waters; Instructors Moser and Riblett; Emeriti: Professors Thorson* and Lindley;* Associate Professor Blackman.

Undergraduate study

Construction science and management

See the description following architectural engineering courses.

Architectural engineering

The architectural engineering program is planned for the student who is particularly interested in the engineering aspects of building design. The architectural engineer must be sympathetic with the practical, functional, and aesthetic possibilities of contemporary materials, and with mechanical, electrical, and structural systems. As an important member of the building design team, he must be able to create designs that will answer the economic, safety, and aesthetic requirements of a project. He must have a feeling of the total design.

Graduate study in architectural engineering

Major work is offered in programs of study leading to the master of science degree with specialization in mechanical and electrical systems design for buildings. A student, in addition to major studies, will generally develop strengths in mathematics, architecture, and structures by taking course work in those fields.

Students who pursue the M.S. program are generally B.S. graduates in architectural engineering from an accredited program. Students with undergraduate degrees in

other disciplines may apply but may need to take additional undergraduate courses. Additional requirements will be decided individually by the Graduate Faculty Committee of the Department of Architectural Engineering and Construction Science.

Curriculum in architectural engineering (ARE)

Bachelor of science in architectural engineering
162 hours required for graduation
Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology

Freshman

Fall semester

| | | |
|----------|--------------------------------------|-----------|
| ENVD 205 | Graphics I | 2 |
| ENGL 100 | English Composition I | 3 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| CHM 210 | Chemistry I | 4 |
| CNS 200 | History of Building and Construction | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 17 |

Spring semester

| | | |
|----------|--|-----------|
| ENVD 206 | Graphics II | 2 |
| CNS 320 | Construction Materials | 2 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| CHM 230 | Chemistry II | 4 |
| ENGL 120 | English Composition II* or | |
| | Humanities or social science electives | 3 |
| NE 385 | Engineering Computational Techniques | 2 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 17 |

Sophomore

Fall semester

| | | |
|----------|---------------------------------------|-----------|
| ART 190 | Drawing I | 2 |
| CNS 321 | Construction Techniques and Detailing | 3 |
| PHYS 213 | Engineering Physics I | 5 |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| SPCH 105 | Public Speaking I | 2 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 16 |

Spring semester

| | | |
|----------|--|-----------|
| CNS 325 | Construction Drawing | 3 |
| CE 333 | Statics | 3 |
| PHYS 214 | Engineering Physics II | 5 |
| MATH 240 | Elementary Differential Equations | 4 |
| ARE 310 | Computer Applications in Architectural Engineering | 1 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 16 |

Junior

Fall semester

| | | |
|----------|--------------------------------------|-----------|
| ME 512 | Dynamics | 3 |
| CE 533 | Mechanics of Materials | 3 |
| CE 534 | Mechanics of Materials Lab | 1 |
| ECON 110 | Economics I | 3 |
| ENGL 415 | Written Communications for Engineers | 3 |
| ARE 532 | Lighting Systems Design | 2 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 15 |

Spring semester

| | | |
|----------|-------------------------------------|-----------|
| ARE 537 | Acoustic Systems | 2 |
| ART 100 | Design I | 2 |
| CE 537 | Introduction to Structural Analysis | 4 |
| ARE 534 | Thermal Systems | 3 |
| CE 212 | Elementary Surveying Engineering | 3 |
| GEOL 100 | Introduction to Geology | 3 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 17 |

Senior

Fall semester

| | | |
|------------------------|------------------------------------|-----------|
| ARE 411 | Architectural Engineering Design I | 3 |
| ME 513 | Thermodynamics | 3 |
| EECE 519 | Electric Circuits and Control | 4 |
| ARE 524 | Theory of Structures II | 3 |
| Complementary elective | | 3 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 16 |

Spring semester

| | | |
|---------------------------------------|-------------------------------------|-----------|
| ARE 523 | Timber Structures | 2 |
| ARE 412 | Architectural Engineering Design II | 3 |
| ARE 528 | Theory of Structures III | 3 |
| ARE 533 | Building Electrical Systems | 3 |
| ME 571 | Fluid Mechanics | 3 |
| Humanities or social science elective | | 3 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 17 |

Fifth year

Fall semester

| | | |
|------------------------|-----------------------------------|-----------|
| Free elective | | 3 |
| ARE 536 | Sanitation Systems | 3 |
| CE 522 | Soil Mechanics I | 3 |
| ARE 540 | Building Mechanics Systems | 3 |
| Complementary elective | | 5 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 17 |

Spring semester

| | | |
|---------------------------------------|--------------------------------------|-----------|
| ARE 595 | Senior Project | 5 |
| ARE 539 | Architectural Engineering Management | 3 |
| Complementary elective | | 3 |
| Humanities or social science elective | | 3 |
| ARE 020 | Architectural Engineering Seminar | 0 |
| | | 14 |

*English Composition II is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum (two courses must be 400 level or above).

Electives are to be selected and approved after consultation with the student's faculty advisor.

Computer Applications in Architectural Engineering (ARE 310) is to be taken by the fourth semester.

Courses in architectural engineering

Undergraduate credit

ARE 020. Architectural Engineering Seminar. (0) I, II. Presentation of professional problems and practices by students, faculty, and professionals associated with the career of architectural engineering. One hour lec. a month. ARE-020-0-0904.

ARE 100. Architectural Engineering Orientation. (2) II. Introduction to architectural engineering; emphasis on relationship of architectural engineering to the building industry. Two hours lec. a week. ARE-100-0-0904.

ARE 310. Computer Applications in Architectural Engineering. (1) I, II. Applications of computer techniques to the solution of problems in architectural engineering. One hour rec. and one hour lab a week. Pr.: MATH 220 and NE 385. ARE-310-0-0904

ARE 411. Architectural Engineering Design I. (3) I. Principles and elements of design; synthesis of structural, mechanical, electrical, sanitary, and construction systems, considering interrelationship in performance and economics. Nine hours lab a week. Pr.: ART 100, 190, CNS 325. ARE-411-1-0904

ARE 412. Architectural Engineering Design II. (3) II. Continuation of Architectural Design I. Nine hours lab a week. Pr.: ARE 411. ARE-412-1-0904

ARE 499. Honors Research in Architectural Engineering. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. ARE-499-4-0904

Undergraduate and graduate credit in minor field

ARE 522. Theory of Structures I. (3) I, II. Bar stresses in trusses; solid and framed arches; mathematical and graphical solution of stresses and deflections in beams under static and moving loads. Six hours a week. Pr.: CE 331. ARE-522-1-0904

ARE 523. Timber Structures. (2) I, II. Analysis and design of timber structures using solid and laminated materials. Two hours rec. a week. Pr.: CE 537. ARE-523-0-0904

ARE 524. Theory of Structures II. (3) I. Analysis and design of metal structures; emphasis on buildings. Two hours rec. and three hours lab a week. Pr.: CE 537. ARE-524-1-0904

ARE 528. Theory of Structures III. (3) II. Design of reinforced concrete building frames; footings, columns, and floor systems, attention being given to costs and economical design. Two hours rec. and three hours lab a week. Pr.: CE 537. ARE-528-1-0904

ARE 532. Lighting Systems Design. (2) I. Study of human needs in lighting, lighting sources, lighting systems design and application. Two hours rec. a week. Pr.: PHYS 114 or 214. ARE-532-0-0904

ARE 533. Building Electrical Systems. (3) II. Study of basic design of building electrical systems including circuit design, power distribution and service equipment, communications systems, and special electrical systems. Three hours rec. a week. Pr.: EECE 519. ARE-533-0-0904

ARE 534. Thermal Systems. (3) I, II. Study of man's physiological needs, principles of heat transfer, principles of building thermal balance, comfort systems, and space-use relationships involving heating, ventilating, and cooling as integral parts of architectural engineering design. Three hours a week. Pr.: PHYS 214 and CNS 321. ARE-534-0-0904

ARE 535. Lighting Systems. (3) I, II. Design of building electrical systems including basic lighting, circuit design, and distribution with emphasis on the National Electrical Code. Three hours rec. a week. Pr.: CNS 321. Pr. or conc.: EECE 519. ARE-535-0-0904

ARE 536. Sanitation Systems. (3) I, II. Stream and water pollution, sewage disposal systems, building piping systems, space relationships, equipment requirements as related to architectural design, structural systems, construction materials, and techniques. Three hours a week. Pr.: PHYS 213 and CNS 321. ARE-536-0-0904

ARE 537. Acoustic Systems. (2) I, II. Hearing and the ear, sound generation, acoustical correction, noise reduction, and sound transmission all as integral parts of architectural design. Two hours a week. Pr.: PHYS 113 or 213. ARE-537-0-0904

ARE 539. Architectural Engineering Management. (3) I, II. General business and management procedures. Drawings, specifications, and conceptual estimating. Contracts, bonds, liability, arbitration, and insurance. Project financing. Pr.: ARE 412. ARE-539-0-0904

ARE 540. Building Mechanical Systems. (3) II. Study of heat gain using computers, pump laws, fan laws, various types of HVAC air systems, chilled water systems, heat pump systems, refrigeration, introduction to mechanical system controls. Pr.: ARE 534 or CNS 534. Three hours rec. a week. ARE-540-0-0904

ARE 595. Senior Project. (5) I, II. Student working individually with laboratory support will prepare and present a project of appropriate scope and complexity with emphasis on structural, mechanical, acoustical, and electrical requirements. Fifteen hours lab a week. Pr.: ARE 412, 523, 524, 528, 534, 535, 536, and 537. ARE-595-1-0904

ARE 596. Senior Project II. (2) II. Continuation of ARE 595. Pr.: ARE 595. ARE-596-1-0904

Undergraduate and graduate credit

ARE 620. Problems in Architectural Engineering. (Var.) I, II, S. A study of specific design problems under the direct supervision of a member of the architectural engineering faculty. Pr.: Approval of the department head. ARE-620-3-0904

ARE 634. Building Thermal System Design. (3) I, II. Design and specifications of selected thermal and mechanical systems for structures. The course uses all the modern techniques of thermal/mechanical system design for buildings. Two hours rec. and three hours lab a week. Pr.: ARE 534 or CNS 534. ARE-634-1-0904

ARE 635. Electrical System Design. (3) I, II. Complete design and specifications of electrical systems for a selected structure. The course uses the National Electrical Code in conjunction with all the modern techniques of electrical system design for buildings. Two hours rec. and three hours lab a week. Pr.: ARE 535 or CNS 535. ARE-635-1-0904

ARE 724. Advanced Sanitation Systems. (3) I. Water quality and treatment, pressure control, and hydraulics in domestic water and waste systems. Three hours rec. a week. Pr.: ARE 536 or CNS 536. ARE-724-0-0904

ARE 731. Advanced Lighting Design. (3) I. Design of all types of building lighting including exterior and site lighting. Calculations and layout utilizing zonal cavity, point by point, and computer-assisted lighting calculations methods. Three hours rec. a week. Pr.: ARE 635. ARE-731-0-0904

ARE 740. Environmental Control Systems in Buildings. (3) II. Electric, electronic, and pneumatic control systems to optimize energy usage and environmental comfort in buildings. Three hours rec. a week. Pr.: ARE 634 and 635. ARE-740-0-0904

ARE 742. Communications and Energy Management Systems Design. (3) II. Detailed design and analysis of special electrical systems for buildings including, but not limited to, energy management, fire alarm, and communication systems. Three hours rec. a week. Pr.: ARE 635. ARE-742-0-0904

ARE 780. Theory of Structures IV. (3) II. Continuation of Theory I, II, and III, with special emphasis on the complete problem of the structure as a whole. Three hours a week. Pr.: CE 537 or ARE 522 and 523, 524, and 528. ARE-780-0-0904

Graduate credit

ARE 834. Advanced Building Thermal Systems Design. (3) I. Applications of special requirements in heating, ventilating, and air conditioning systems design. Three hours rec. a week. Pr.: ARE 634. ARE-834-0-0904

ARE 885. Structural Systems Design. (3) I, II. A study of integrated structural, mechanical, and electrical systems; economic evaluation. Two hours rec. and three hours lab a week. Pr.: ARE 780. ARE-885-1-0904

ARE 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. ARE-898-4-0904

ARE 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. ARE-899-4-0904

Construction science and management

The construction science and management program prepares the student to be a professional constructor; a manager of personnel resources, financial resources, materials, and machines. The curriculum is an engineering-based management program designed to produce a technically competent manager of construction. The entering student should have a background in mathematics and physics.

The program prepares the graduate to execute the designs created by engineers and architects. Graduates may enter fields of general, heavy and highway, utility, mechanical, or electrical construction. Their education provides the fundamental engineering and management skills necessary for success in any of the above areas.

Constructors work in many settings. For example, as a principal in a small construction firm, a constructor may engage in many of the activities in management, whereas a constructor in a large firm may concentrate exclusively on only one or two of the activities. Most students in the program intend to enter building, heavy/highway, or utility construction fields. Other roles, such as construction education, will normally require an advanced degree and/or professional experience.

Through construction education, the student will attain a level of construction knowledge which would otherwise require decades of practical experience to develop. With this level of knowledge, graduates typically move rapidly into upper management positions in construction organizations.

The construction science and management program is accredited by the American Council for Construction Education (ACCE).

Curriculum in construction science and management (CNS)

Bachelor of science in construction science and management
133 hours required for graduation
Accredited by the American Council for Construction Education

Freshman

Fall semester

| | | |
|----------|--------------------------------------|----|
| CNS 200 | History of Building and Construction | 3 |
| | English Composition I | 3 |
| ENGL 100 | Analytic Geometry and Calculus I | 4 |
| MATH 220 | Graphics I | 2 |
| ENVD 205 | Public Speaking IA | 2 |
| SPCH 105 | Principles of Physical Fitness | 1 |
| PE 101 | Construction Seminar | 0 |
| CNS 016 | | 16 |

Spring semester

| | | |
|---|---|-----------|
| CE 212 | Elementary Surveying Engineering | 3 |
| ENVD 206 | Graphics II | 2 |
| ENGL 120 | English Composition II* | |
| | or | |
| Humanities or social science elective | | 3 |
| NE 385 | Engineering Computational Techniques | 2 |
| PHYS 113 | General Physics I | 4 |
| CNS 320 | Construction Materials | 2 |
| CNS 016 | Construction Seminar | 0 |
| | | 16 |

Sophomore**Fall semester**

| | | |
|----------|--|-----------|
| CNS 321 | Construction Techniques and Detailing | 3 |
| CE 231 | Statics A | 3 |
| CNS 250 | Site Construction | 3 |
| GEOL 100 | Introductory Geology | 3 |
| ECON 110 | Economics I | 3 |
| CNS 016 | Construction Seminar | 0 |
| | | 15 |

Spring semester

| | | |
|--|--|-----------|
| CNS 310 | Computer Applications in Construction Science | 1 |
| CNS 325 | Construction Drawing | 3 |
| CE 331 | Strength of Materials | 3 |
| CE 332 | Strength of Materials Lab | 1 |
| PHYS 114 | General Physics II | 4 |
| ACCTG 211 | Financial Accounting | 3 |
| Humanities or social science electives | | 3 |
| CNS 016 | Construction Seminar | 0 |
| | | 18 |

Junior**Fall semester**

| | | |
|---|---|-----------|
| ARE 522 | Theory of Structures I | 3 |
| ARE 537 | Acoustic Systems | 2 |
| CNS 535 | Electrical Service and Installation .. | 3 |
| CNS 540 | Construction Methods and Equipment | 3 |
| Humanities or social science elective | | 3 |
| Management elective | | 3 |
| CNS 016 | Construction Seminar | 0 |
| | | 17 |

Spring semester

| | | |
|---------------------------|--|-----------|
| CNS 523 | Timber Construction | 2 |
| CNS 534 | Heating and Air Conditioning | 3 |
| CNS 536 | Water Supply and Sanitation | 3 |
| ENGL 415 | Written Communication for Engineers | 3 |
| MANGT 390 | Business Law I | 3 |
| Management elective | | 3 |
| CNS 016 | Construction Seminar | 0 |
| | | 17 |

Senior**Fall semester**

| | | |
|--|---------------------------------|-----------|
| CNS 524 | Steel Construction | 3 |
| CNS 541 | Construction Estimating | 3 |
| CNS 542 | Construction Management I | 3 |
| Management or professional elective | | 3 |
| Management or professional elective | | 3 |
| Humanities or social science electives | | 3 |
| CNS 016 | Construction Seminar | 0 |
| | | 18 |

Spring semester

| | | |
|------------------------------|--|-----------|
| CNS 528 | Concrete and Masonry Construction | 3 |
| CNS 543 | Construction Management II | 3 |
| CE 322 | Soil and Foundation Construction .. | 3 |
| Professional electives | | 5 |
| Free electives | | 3 |
| CNS 016 | Construction Seminar | 0 |
| | | 17 |

*English Composition II is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum (two courses must be 400 level or above).

Management and professional electives are to be selected from approved list.

Technical Calculus I and II may be taken in lieu of Analytic Geometry and Calculus I and free elective.

Computer Applications in Construction Science (CNS 310) must be taken by the end of the fourth semester.

Courses in construction science and management

Undergraduate credit

CNS 016. Construction Seminar. (0) I, II. Presentation of professional problems and practices by students, faculty, contractors, architects, and various organizations associated with the building industry. One hour lec. a month. CNS-016-0-0904

CNS 200. History of Building and Construction. (3) I, II. An introduction to the art and science of building. Historical review from ancient to contemporary including related construction methods, equipment, and systems. CNS-200-0-0904

CNS 210. Introduction to Construction Programming. (3) I, II. Application of digital computer techniques to the solution of elementary problems in construction science and architecture. Pr.: MATH 150. Four hours a week. CNS-210-0-0904

CNS 250. Site Construction. (3) I, II. Study of site construction problems and procedures, site survey and investigations, review of site plans, construction layouts, earthwork calculations; computer applications. Pr.: ENVD 206, NE 385, CE 212. Four hours a week. CNS-250-1-0904

CNS 310. Computer Applications in Construction Science. (1) I, II. Applications of computer techniques to the solution of problems in construction science. One hour rec. and one hour lab a week. Pr.: MATH 211 or 220 and NE 385. CNS-310-0-0-0904

CNS 320. Construction Materials. (2) I, II. Study and analysis of construction materials, their properties, selection, and use. Two hours rec. a week. Pr.: ENVD 205. CNS-320-0-0904

CNS 321. Construction Techniques and Detailing. (3) I, II. Study of construction methods and procedures in the assembly of building materials. Nine hours lab a week. Pr.: ENVD 206, CNS 320. CNS-321-1-0904

CNS 325. Construction Drawings. (3) I, II. Production of a set of construction drawings. Emphasis on construction procedures. Introduction to shop drawings. Nine hours lab a week. Pr.: CNS 321. CNS-325-1-0904

CNS 499. Honors Research in Construction Science. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. CNS-499-4-0904

Undergraduate and graduate credit in minor field

CNS 523. Timber Construction. (2) I, II. Principles of design, fabrication, and erection of timber structures including both solid and laminated materials. Two hours rec. a week. Pr.: ARE 522. CNS-523-0-0904

CNS 524. Steel Construction. (3) I, II. Principles of design, fabrication, and erection of structural steel in conformance with codes. Two hours lec. and three hours lab a week. Pr.: ARE 522. CNS-524-0-0904

CNS 528. Concrete and Masonry Construction. (3) I, II. Principles of design, fabrication, and erection of concrete and masonry structures. Two hours lec. and three hours lab a week. Pr.: ARE 522. CNS-528-0-0904

CNS 534. Heating and Air Conditioning. (3) I, II. Principles of designing, applying, installing, and estimating heating and air conditioning systems for buildings. Three hours rec. a week. Pr.: PHYS 113 and CNS 321. CNS-534-0-0904

CNS 535. Electrical Service and Installation. (3) I, II. Basic design and construction of building electrical, lighting, and distribution systems with emphasis on the National Electrical Code and installation. Three hours rec. a week. Pr.: PHYS 114 and CNS 321. CNS-535-0-0904

CNS 536. Water Supply and Sanitation. (3) I, II. Principles and practices of sanitation and water supply in buildings including code requirements and estimating. Pr.: PHYS 113 and CNS 321. CNS-536-0-0904

CNS 540. Construction Methods and Equipment. (3) I, II. Practical problems encountered in the erection of buildings and use of construction equipment. Pr.: CNS 250 and 321. CNS-540-0-0904

CNS 541. Construction Estimating. (3) I, II. Principles, theories, and methods of building estimating. Nine hours lab a week. Pr.: CNS 325 and 540. CNS-541-1-0904

CNS 542. Construction Management I. (3) I, II. General business and management procedures of construction contracting; human relations and communications. Pr.: CNS 540. CNS-542-0-0904

CNS 543. Construction Management II. (3) I, II. Construction safety; project planning and scheduling techniques. Computer applications. Pr.: NE 385, CNS 541, and 542. CNS-543-0-0904

CNS 544. Problems in Construction Science. (Var.) I, II, S. A study of specific design problems under the direct supervision of a member of the construction science faculty. Pr.: Junior standing. CNS-544-3-0904

CNS 545. Construction Problems. (2) I. Analysis of form-work design for standard and unusual wall and floor shapes. Analysis of temporary construction structures. Study of concrete placement techniques, construction failures, advanced construction techniques, time-motion studies, and equipment management. Pr.: CNS 540, 523, 325. Pr. or conc.: CNS 524. CNS-545-0-0904

CNS 638. Mechanical and Electrical Estimating. (2) I, II. Techniques of mechanical and electrical building systems estimating. Procedures for evaluating relative costs of different systems. Two three-hour labs a week. Pr.: ARE 534 and 535 or CNS 534 and 535. CNS-638-1-0904

Chemical Engineering

L. T. Fan,* Head

Professors Akins,* Erickson,* Fan,* Glasgow,* Kyle,* Matthews,* and Walawender;* Associate Professor Schlup;* Assistant Professor Edgar; Adjunct Assistant Professor Huang;* Emeriti: Professors Bates and Honstead.

Undergraduate study

Chemical engineers contribute to society through the useful application of knowledge and understanding of chemistry, physics, and mathematics. Chemical engineers can expect to participate in many decisions crucial to the preservation and improvement of society, especially in energy and food production, resource manage-

ment, and the specification and design of pollution control processes.

The chemical engineering curriculum is best suited to highly motivated students with strong abilities in chemistry, physics, and mathematics. The first two years are devoted to a study of the pure sciences and the essential communication skills. In the last two years emphasis is placed upon the application of these sciences through the study of transport processes, separation techniques, thermodynamics, reaction engineering, process dynamics, and systems design.

Dual degree program

The Department of Chemical Engineering also offers a five-year dual degree program in chemistry/chemical engineering. The program may be pursued entirely at KSU, requiring a minimum of 150 credit hours, or a portion of the requirements may be completed at other colleges. In particular, a formal cooperative program exists between KSU and Pittsburg State University in which the student spends the first three years at PSU and the last two at KSU. Graduates of this program are especially well suited for work in the chemical industries or for graduate study in either field. Other dual degree programs also are available.

Chemical engineering options

While students must satisfy the engineering science requirements in selecting technical electives, they are encouraged to do so with their career goals in mind. If a student wishes to emphasize a particular area, such as biochemical, food, computer and systems, materials, energy, or environmental engineering, lists of recommended technical electives are available in the department office. The Secondary Majors section of this catalog describes opportunities for chemical engineering students interested in business administration, pre-medicine, pre-law, mathematics, physics, and chemistry. Students should consult with their academic advisor in selecting their technical electives.

Graduate study

Major work leading to the master of science and doctor of philosophy degrees in several areas is offered. Research in transport phenomena, reaction engineering, diffusional processes, thermodynamics, process dynamics, materials processing, optimization techniques, and process development is underway, and new fields of research are being developed. Support for this research comes from federal, state, and industrial sources. Laboratory space, equipment, and instruments are available for this research. The department has shop facilities in which unusual equipment is built and an instrument specialist to maintain and repair research equipment. A glassblower is available on the campus, and the College of

Engineering and the University computing centers are used extensively by graduate students.

Curriculum in chemical engineering (CHE)

Bachelor of science in chemical engineering
134 hours required for graduation
Accredited by the Engineering Accreditation
Commission of the Accreditation Board for Engineering
and Technology

Freshman

| Fall semester | |
|---------------|--|
| ENGL 100 | English Composition I* 3 |
| CHM 210 | Chemistry I 4 |
| MATH 220 | Analytic Geometry and Calculus I . . 4 |
| ECON 110 | Economics I 3 |
| SPCH 105 | Public Speaking IA 2 |
| PE 101 | Principles of Physical Fitness 1 |
| CHE 015 | Engineering Assembly 0 |
| | <hr/> 17 |

Spring semester

| | | |
|--------------------|--|----|
| ENGL 120 | English Composition II* | |
| | or | |
| Humanities or | social science electives | 3 |
| CHM 230 | Chemistry II | 4 |
| CHM 271 | Chemical Analysis | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| Elective | | 3 |
| CHE 015 | Engineering Assembly | 0 |
| | <hr/> | 18 |

Sophomore

| Fall semester | | |
|--------------------|--|----|
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| PHYS 213 | Engineering Physics I | 5 |
| CHM 531 | Organic Chemistry I | 3 |
| CHE 316 | Chemical Engineering Computational Techniques I | 1 |
| Elective | | 3 |
| CHE 015 | Engineering Assembly | 0 |
| | <hr/> | 16 |

Spring semester

| | | |
|----------|--|----|
| MATH 240 | Elementary Differential Equations | 4 |
| PHYS 214 | Engineering Physics II | 5 |
| CHM 550 | Organic Chemistry II | 3 |
| CHE 314 | Introduction to Process Analysis . . . 3 | |
| CHM 532 | Organic Chemistry Lab | 2 |
| CHE 015 | Engineering Assembly | 0 |
| | <hr/> | 17 |

Junior

| Fall semester | | |
|--------------------|--|----|
| CHM 585 | Physical Chemistry I | 3 |
| CHM 586 | Physical Chemistry I Lab | 2 |
| CHE 520 | Chemical Engineering Thermodynamics I | 2 |
| CHE 530 | Transport Phenomena I | 3 |
| Elective | | 6 |
| CHE 015 | Engineering Assembly | 0 |
| | <hr/> | 16 |

Spring semester

| | | |
|--------------------|---|----|
| CHM 595 | Physical Chemistry II | 3 |
| ENGL 415 | Written Communication for Engineers* | 3 |
| CHE 522 | Chemical Engineering Lab I | 2 |
| CHE 521 | Chemical Engineering Thermodynamics II | 3 |
| CHE 531 | Transport Phenomena II | 3 |
| Elective | | 3 |
| CHE 015 | Engineering Assembly | 0 |
| | <hr/> | 17 |

Senior

| Fall semester | | |
|--------------------|---|----|
| CHE 516 | Chemical Engineering Computational Techniques II | 1 |
| CHE 532 | Chemical Engineering Lab II | 2 |
| CHE 560 | Separational Process Design | 3 |
| CHE 550 | Chemical Reaction Engineering 3 | |
| CHE 570 | Chemical Engineering Systems Design I | 2 |
| Elective | | 6 |
| CHE 015 | Engineering Assembly | 0 |
| | <hr/> | 17 |

Spring semester

| | | |
|--------------------|---|----|
| CHE 542 | Chemical Engineering Lab III | 3 |
| CHE 561 | Chemical Process Dynamics and Control | 3 |
| CHE 571 | Chemical Engineering Systems Design II | 4 |
| Elective | | 6 |
| CHE 015 | Engineering Assembly | 0 |
| | <hr/> | 16 |

*English Composition II is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I.

Thirty hours of electives are required and they are to be selected in consultation with the student's advisor. Fifteen of these hours are to be selected from the approved list of humanities and social sciences (two courses must be 400 level or above). Nine hours must satisfy the engineering science requirements, and the remaining six hours are selected to enhance the student's professional development. All electives must have the approval of the department head and technical electives must meet the engineering science requirements.

Courses in chemical engineering Undergraduate credit

CHE 015. Engineering Assembly. (0) I, II. CHE-015-0-0906

CHE 314. Introduction to Process Analysis. (3) I, II, S. An introduction to the basic concepts of chemical engineering. Three hours rec. a week. Pr. or conc.: MATH 240 and CHE 316. CHE-314-0-0906

CHE 316. Chemical Engineering Computational Techniques I. (1) I, II, S. Introduction to the application of digital computers to chemical engineering problems. Three hours lab a week. Pr. or conc.: MATH 221. CHE-316-1-0906

CHE 350. Engineering Materials. (2) I, II. Structures of metals, ceramics, glasses, polymers, semiconductors, and composites. Mechanical, electrical, and magnetic properties. Multiphase equilibrium and modification of properties through changes in microstructure. Two hours rec. a week. Pr.: CHM 230. Pr. or conc.: PHYS 213. CHE-350-0-0913

CHE 352. Engineering Materials I. (3) I, II. Structure of metals, ceramics, glasses, polymers, semiconductors, and composites. Mechanical, electrical, and magnetic properties. Multiphase equilibrium and modification of properties through change in microstructure. Two hours rec. a week and three hours lab a week. Pr.: CHM 230. Pr. or conc.: PHYS 213. CHE-352-1-0913

CHE 356. Corrosion. (1) I, II. An introductory survey of corrosion mechanisms and prevention. Emphasis is on the corrosion of metals. One hour rec. a week. Pr.: CHE 350 or 352. CHE-356-0-0906

CHE 499. Honors Research in Chemical Engineering. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. CHE-499-4-0906

Undergraduate and graduate credit in minor field

CHE 516. Chemical Engineering Computational

Techniques II. (1) I. Application of digital computers to chemical engineering problems. Three hours of lab a week. Pr.: CHE 316. Pr. or conc.: CHE 550 and 560. CHE-516-1-0906

CHE 520. Ch.E. Thermodynamics I. (2) 1. A study of the first and second laws of thermodynamics, real gases, heat of solution and reaction. Two hours rec. a week. Pr. or conc.: CHE 314 and CHM 585. CHE-520-0-0906

CHE 521. Ch.E. Thermodynamics II. (3) II. A continuation of the study of the second law, thermodynamic analysis of processes, phase equilibrium, chemical reaction equilibrium. Three hours rec. a week. Pr.: CHE 520. CHE-521-0-0906

CHE 522. Chemical Engineering Laboratory I. (2) II. Laboratory experiments on momentum and heat transfer. Five hours lab a week. Pr.: CHE 520 and 530. CHE-522-1-0906

CHE 530. Transport Phenomena I. (3) I. A unified treatment of the basic principles of momentum, energy, and mass transport. Three hours rec. a week. Pr. or conc.: CHE 314. CHE-530-0-0906

CHE 531. Transport Phenomena II. (3) II. Continuation of Transport Phenomena I with special emphasis on mass transfer. Three hours rec. a week. Pr.: CHE 530. CHE-531-0-0906

CHE 532. Chemical Engineering Laboratory II. (2) I. Laboratory experiments on heat and mass transfer. Five hours lab a week. Pr.: CHE 521 and 531. CHE-532-1-0906

CHE 542. Chemical Engineering Laboratory III. (3) II. Laboratory experiments on classical unit operations, e.g., distillation, absorption, extraction, and on chemical kinetics and process dynamics. Eight hours lab a week. Pr.: CHE 550, 560, and 561. CHE-542-1-0906

CHE 550. Chemical Reaction Engineering. (3) I. Applied chemical kinetics and catalysis including the analysis and design of tubular, packed bed, stirred tank, and fluidized bed chemical reactors. Three hours rec. a week. Pr.: CHE 521 and 531. CHE-550-0-0906

CHE 560. Separational Process Design. (3) I. Development of the basic theory and design of separational processes such as distillation, gas absorption, liquid extraction, adsorption, and ion exchange. Three hours rec. a week. Pr.: CHE 521 and 531. CHE-560-0-0906

CHE 561. Chemical Process Dynamics and Control. (3) II. A study of the unsteady state behavior and control of chemical processes. Three hours rec. a week. Pr.: CHE 550. CHE-561-0-0906

CHE 570. Chemical Engineering Systems Design I. (2) I. Basic concepts of process economics with application to the design of chemical processes. Two hours rec. a week. Pr. or conc.: CHE 550 and 560. CHE-570-1-0906

CHE 571. Chemical Engineering Systems Design II. (4) II. Basic concepts of process optimization with application to the synthesis and design of chemical processing systems. Emphasis will be on the solution of comprehensive systems design problems. Two hours rec. and six hours lab a week. Pr.: CHE 550, 560, 561, and 570. CHE-571-1-0906

CHE 580. Problems in Chemical Engineering or Materials Science. (Var.) I, II, S. An introduction to chemical engineering research. Pr.: Approval of department head. CHE-580-4-0906

Undergraduate and graduate credit

CHE 626. Bioseparations. (2) II, in even years. Study of separations important in food and biochemical engineering such as leaching, extraction, expression, absorption, ion exchange, filtration, centrifugation, membrane separation, and chromatographic separations. Two hours rec. a week. Pr.: CHE 531 or AGE 575. CHE-626-0-0906

CHE 648. Processing of Composite Materials. (3) I, II. Principles of composite materials, including ceramic, metal, and polymer matrix composites; properties and processing of fibers; role of interfaces in composites; basic concepts in mechanics, failure, and testing of composite materials. Three hours lec. a week. Pr.: CHE 350 or 352. CHE-648-0-0913

CHE 650. Hazardous Waste Engineering Seminar. (1) I, II, S. Topics in hazardous materials management and control, waste reduction and minimization, hazardous substance tracking, and hazardous waste engineering. One hour rec. a week. Pr.: CHM 230. CHE-650-0-0906

CHE 653. Ceramic Materials. (3) I, II. Structure and bonding in glasses and ceramics; phase equilibria and transformation kinetics; defects and microstructure within ceramic materials; mechanical, thermal, optical, electrical, and magnetic properties of ceramics and glasses. Three hours rec. a week. Pr.: CHE 350 or 352. CHE-653-0-0913

CHE 661. Processing of Materials for Solid State Devices. (3) I, II. Structure, properties, and processing of materials for solid state devices. Crystal growth, epitaxy, oxidation, diffusion, lithography, and etching as applied to device fabrication. Three hours rec. a week. Pr.: CHE 350 or 352. CHE-661-0-0913

CHE 664. Electrochemical Engineering. (3) I, II. Thermodynamics, electrode kinetics, and transport phenomena of electrochemical systems. Three hours rec. a week. Pr.: CHE 521 and 531. CHE-664-1-0906

CHE 681. Engineering Materials II. (3) I, II, S. The structure and bonding in crystalline and amorphous materials; crystallography; thermodynamic stability in materials; equilibrium diagrams and the phase rule; rate theory and kinetics of solid-state transformations; mechanical behavior of engineering materials; dislocations; failure mechanisms. Three hours lec. a week. Pr.: CHE 350 or 352. CHE-681-0-0913

CHE 682. Surface Phenomena. (2) I, II, S. Principles and applications of interfacial phenomena, including capillarity, colloids, porosity, adsorption, and catalysis. Two hours rec. a week. Pr.: CHE 520. CHE-682-0-0906

CHE 715. Biochemical Engineering. (3) I. The analysis and design of biochemical processing systems with emphasis on fermentation kinetics, continuous fermentations, aeration, agitation, scale up, sterilization, and control. Three hours rec. a week. Pr. or conc.: CHE 550. CHE-715-0-0906

CHE 725. Biotransport Phenomena. (3) I, II. Principles of transport phenomena applied to biological and physiological processes. Membrane transport processes, circulatory system transport phenomena, transport and distribution of drugs. Pr.: CHE 530. CHE-725-0-0906

CHE 735. Chemical Engineering Analysis I. (3) I, II, S. The mathematical formulation of problems in chemical engineering using partial differential equations, vector and tensor notation. Solution of these problems by graphical, numerical, and transform methods. Three hours rec. a week. Pr.: CHE 530. CHE-735-0-0906

CHE 745. Analysis of Physiological Processes. (3) II. Principles of process and systems analysis applied to problems in biology and medicine. Analysis of mixing in-flow systems, principles and applications of tracer analysis, analysis of kinetic and adsorption processes. Pr.: CHE 550. CHE-745-0-0906

Graduate credit

CHE 802. Selected Topics in Materials Science. (Var.) I, II, S. Areas of current interest in materials including solidification, transformations, solutions, dislocations, creep, fracture, failure analysis, and failure prevention. Pr.: CHE 681. CHE-802-4-0913

CHE 805. Selected Topics in Biochemical Engineering. (3) II, S. Subjects of current interest in the broadest sense of biochemical engineering. These involve not only chemical engineering problems which contain biochemical, biological, or medical elements but also applications of chemical engineering principles and methodologies to biochemical, biological, medical, and ecological problems. Pr.: CHE 715. CHE-805-0-0906

CHE 810. Research in Chemical Engineering. (Var.) I, II, S. Original investigations in transport phenomena, unit operations, thermodynamics, process dynamics, applied chemical kinetics, and process development. The results of these investigations may be used for the master's thesis or the doctoral dissertation. CHE-810-4-0906

CHE 815. Advanced Chemical Engineering Thermodynamics. (3) I, II, S. Advanced topics in thermodynamics, with emphasis on chemical and physical equilibria and the estimation of thermodynamic properties. Three hours rec. a week. Pr.: Graduate standing in chemical engineering. CHE-815-0-0906

CHE 822. Advanced Chemical Reaction Engineering. (3) I, II, S. Theory of kinetics and catalysis in homogeneous and heterogeneous systems, with applications in chemical reactor design and process development. Three hours rec. a week. Pr.: CHE 550. CHE-822-0-0906

CHE 826. Advanced Unit Operations I. (3) I, II, S. Advanced study of mass transfer operations. Three hours rec. a week. Pr.: CHE 560. CHE-826-0-0906

CHE 832. Advanced Unit Operations II. (3) I, II, S. Advanced study of the operations involving mechanical separation of materials. Three hours rec. a week. Pr.: CHE 560. CHE-832-0-0906

CHE 850. Advanced Chemical Process Dynamics. (3) I, II, S. The dynamical behavior of chemical reaction systems and process equipment used in chemical plants. Control mechanisms for these systems. Three hours rec. a week. Pr.: Graduate standing in chemical engineering. CHE-850-0-0906

CHE 862. Advanced Transport Phenomena I. (3) I, II, S. Advanced treatment of momentum, energy, and mass transport, with emphasis on momentum transport in chemical engineering applications. Three hours rec. a week. Pr.: CHE 735. CHE-862-0-0906

CHE 867. Advanced Transport Phenomena II. (3) I, II, S. Advanced treatment of momentum, energy, and mass transport, with emphasis on energy and mass transport in chemical engineering applications. Three hours rec. a week. Pr.: CHE 862. CHE-867-0-0906

CHE 871. Advanced Process Design and Optimization. (3) I, II, S. Advanced problems in the optimal design and economic evaluation of plant equipment and processes for the chemical and allied industries. Three hours rec. a week. Pr.: CHE 571 and 735. CHE-871-0-0906

CHE 875. Graduate Seminar in Chemical Engineering. (1) I, II. Discussion of current advances and research in chemical engineering and related fields. CHE-875-0-0906

CHE 898. Master's Report. (Var.) I, II, S. Topics selected with approval of department head and major professor. CHE-898-4-0906

CHE 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of department head and major professor. CHE-899-4-0906

CHE 901. Selected Topics in Reaction Engineering. (3) I, II, S. Advanced study in this field of such topics as complex reactions, catalysis, dispersion effects, fast reactions, reactions in fluidized beds. Three hours rec. a week. Pr.: CHE 822 and one course in chemical engineering numbered 851 or higher. CHE-901-0-0906

CHE 910. Selected Topics in Transport Phenomena. (3) I, II, S. Subjects of current interest such as surface phenomena, turbulent transport, droplet mechanics, multicomponent systems. Three hours rec. a week. Pr.: CHE 867. CHE-910-0-0906

CHE 915. Selected Topics in Process Dynamics. (3) I, II, S. Study of the most recent methods for analysis of the dynamic behavior and control of complex systems and industrial processes. The use of Lyapunov theorems and the maximum principle are examples of the methods to be studied. Three hours rec. a week. Pr.: CHE 850 and one graduate course in chemical engineering numbered 851 or higher. CHE-915-0-0906

CHE 920. Selected Topics in Unit Operations. (3) I, II, S. Study of such topics as zone melting, foam fractionation, membrane permeation, thermal diffusion, and unsteady state operations. Three hours rec. a week. Pr.: CHE 826 or 832 and one course in chemical engineering numbered 851 or higher. CHE-920-0-0906

CHE 925. Selected Topics in Process Design and Optimization. (3) I, II, S. Study of advanced methods of process design and optimization, such as modern variational methods and dynamic programming. Applications to be chosen mainly from the chemical and allied industries to include stochastic as well as deterministic problems. Three hours rec. a week. Pr.: CHE 871. CHE-925-0-0906

CHE 930. Selected Topics in Thermodynamics. (3) I, II, S. Advanced study in this field of such topics as irreversible thermodynamics, solution theory, and surface phenomena. Three hours rec. a week. Pr.: CHE 815 and one course in chemical engineering numbered 851 or higher. CHE-930-0-0906

CHE 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of department head and major professor. CHE-999-4-0906

Civil Engineering

Robert R. Snell,* Head

Professors Best,* Cooper,* Hu,* Koelliker,* Mathews,* Russell,* Smith,* Snell,* Swartz,* and Williams,* Associate Professor Lin,* Assistant Professors Banks, Mok,* and Tracy,* Emeriti: Professors McCormick and Morse.

Undergraduate study

Civil engineering is the engineering of constructed facilities and systems. Because civil engineering is so broad in scope, it has become desirable for many civil engineers to develop specialties within the broad field. As a means of satisfying that desire for specialization the civil engineering department offers three options within the B.S. in civil engineering degree.

The general option allows the student to pursue a B.S. in civil engineering degree in a broad general program or, if a specific career objective has been identified, to concentrate on one or more areas within the general option. The following areas of concentration are available:

Hydraulics—design and construction of reservoirs, canal systems, and dams for flood control, irrigation, power, and water supply.

Soils and foundations—foundations for structures, earth embankments, retaining walls and bulkheads, and pavements for highways and airports.

Environmental—protection of public health and environmental quality through the planning and designing of facilities for water treatment and distribution; wastewater, solid and hazardous wastes collection, treatment, and disposal; and air pollution control.

Transportation—planning, design, and construction of highways, railways, airports, and urban mass transit systems.

Structures—design and construction of a wide variety of buildings and bridges, as well as the structural framing of aircraft, ships, and space vehicles.

Construction engineering option
This option allows the student to pursue a B.S. in civil engineering program while preparing specifically for employment in the construction industry.

Graduate study

Major work leading to the master of science and doctor of philosophy degrees is offered in the areas of specialization in structural analysis and design, soil mechanics and foundations, hydraulic engineering, sanitary/environmental engineering, highway and traffic engineering, and transportation planning. Laboratory facilities for advanced study and research are available in the areas of structures, soil mechanics, hydraulics, sanitary engineering, and transportation.

Curriculum in civil engineering (CE)

Bachelor of science in civil engineering
134 hours required for graduation
Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology

Freshman

Fall semester

| | | |
|----------|--------------------------------------|----------|
| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
| CHM 210 | Chemistry I | 4 |
| ENGL 100 | English Composition I* | 3 |
| ECON 110 | Economics I | 3 |
| ME 212 | Engineering Graphics I | 2 |
| PE 101 | Principles of Physical Fitness | 1 |
| | | <hr/> 17 |

Spring semester

| | | |
|-----------------|--|----------|
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| CHM 230 | Chemistry II | 4 |
| ENGL 120 | English Composition II* or | |
| Option elective | ..... | 3 |
| NE 385 | Engineering Computational Techniques | 2 |
| GEOL 100 | Introductory Geology | 3 |
| CE 015 | Engineering Assembly | 0 |
| | | <hr/> 16 |

Sophomore

Fall semester

| | | |
|-----------------|--|----------|
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| PHYS 213 | Engineering Physics I | 5 |
| Option elective | ..... | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| CE 212 | Elementary Surveying Engineering | 3 |
| CE 015 | Engineering Assembly | 0 |
| | | <hr/> 17 |

Spring semester

| | | |
|-----------------|--|----------|
| MATH 240 | Elementary Differential Equations | 4 |
| PHYS 214 | Engineering Physics II | 5 |
| CE 333 | Statics | 3 |
| Option elective | ..... | 4 |
| CE 380 | Computer Applications in Civil Engineering | 1 |
| CE 015 | Engineering Assembly | 0 |
| | | <hr/> 17 |

Junior

Fall semester

| | | |
|--------|----------------------------------|----------|
| CE 411 | Route Location and Design | 4 |
| ME 512 | Dynamics | 3 |
| ME 513 | Thermodynamics I | 3 |
| CE 551 | Hydrology | 2 |
| CE 553 | Hydrologic Methods Lab | 1 |
| CE 533 | Mechanics of Materials | 3 |
| CE 534 | Mechanics of Materials Lab | 1 |
| CE 015 | Engineering Assembly | 0 |
| | | <hr/> 17 |

Spring semester

| | | |
|----------|--|----------|
| CE 537 | Introduction to Structural Analysis | 4 |
| ME 571 | Fluid Mechanics | 3 |
| CE 522 | Soil Mechanics I | 3 |
| CE 563 | Environmental Engineering Fundamentals | 3 |
| ENGL 415 | Written Communication for Engineers* | 3 |
| CE 015 | Engineering Assembly | 0 |
| | | <hr/> 16 |

Senior

Fall semester

| | | |
|--|----------------------------|----------|
| CE 015 | Engineering Assembly | 0 |
| Option elective | ..... | 6 |
| Civil engineering electives | ..... | 6 |
| Humanities or social science electives | ..... | 6 |
| | | <hr/> 18 |

Spring semester

| | | |
|--|---------------------------------|----------|
| CE 015 | Engineering Assembly | 0 |
| CE 585 | Civil Engineering Project | 3 |
| Civil engineering elective | ..... | 3 |
| Humanities or social science electives | ..... | 7 |
| Option elective | ..... | 3 |
| | | <hr/> 16 |

*English Composition II is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum (two courses must be 400 level or above).

Option electives are to be selected in consultation with the student's faculty advisor to satisfy the requirements of the concentration the student has chosen. One course from either the engineering materials or circuits, fields, and electronics engineering science group is required.

Civil engineering electives are to be selected from the list approved by the department.

Civil engineering options

General

In the general option, the student may select a set of interrelated option and civil engineering electives which will enable the student to complete a broad general program or to concentrate on one or more areas within the general option. The areas of concentration available are structural analysis and design, soil mechanics and foundations, hydraulic engineering, sanitary/environmental engineering, and highway and traffic engineering.

Construction engineering

A student pursuing the construction engineering option within the Department of Civil Engineering can fulfill the requirements for a B.S. in civil engineering by following the outlined course curriculum listed for civil engineering as well as the following selection of option electives:

| | | |
|------------------------------------|--|-----|
| DEN 450 | Engineering Law | 3 |
| CE 641 | Civil Engineering Materials | 3 |
| Construction option elective | | 1-4 |
| CE 680 | Economics of Design and Construction | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| ACCTG 221 | Managerial Accounting | 3 |

Courses in civil engineering

Undergraduate credit

CE 015. Engineering Assembly. (0) I, II. CE-015-0-0908

CE 212. Elementary Surveying Engineering. (3) I, II. Coordinates, directions, distances, and elevation. Traverses. Boundary surveys. Leveling. National rectangular coordinate systems. Property descriptions: public land subdivision and metes and bounds. Topographic surveys. Surveying, planning, and estimating. One hour lec. and six hours lab a week. Pr.: MATH 150. CE-212-1-0908

CE 231. Statics A. (3) I, II. Composition and resolution of forces; equilibrium of force systems; application of the principles of statics to problems, including force analyses of simple structures. Centroids; moments of inertia. Three hours rec. a week. Pr.: PHYS 113 and MATH 220 or conc.: MATH 211. CE-231-0-0999

CE 322. Soil and Foundation Construction. (3) II. The origin, distribution, and predictable variation of soil; soil testing and mechanics as applied to practical problems; soil investigations; foundation types, application and construction; ground water, drainage, and dewatering; earth moving including stable cuts in embankments. Not open to engineering students. Two hours rec. and three hours lab a week. Pr. or conc.: GEOL 100. CE-322-0-0908

CE 331. Strength of Materials A. (3) I, II. Behavior of materials subjected to tension, compression, shear, and bending; design of beams and columns. Three hours rec. a week. Pr.: CE 231. CE-331-0-0999

CE 332. Strength of Materials A Laboratory. (1) I, II. Tests to determine the physical properties of various structural materials. Analysis and interpretation of test data. Three hours lab a week. Pr.: ENGL 120 or 100 with grade of A or B, and one course in graphics. Pr. or conc.: CE 331. CE-332-1-0999

CE 333. Statics. (3) I, II, S. Composition and resolution of forces; equilibrium of force systems; application of general laws of statics to engineering problems, including use of vector algebra, friction and force analyses of simple structures, cables, and machine elements; center of gravity; moments of inertia. Three hours rec. a week. Pr.: MATH 221 and PHYS 213. CE-333-0-0999

CE 380. Computer Applications In Civil Engineering. (1) I, II. Application of computer techniques to problems in civil engineering, including programming and software packages. One hour rec. and two hours lab a week. Pr.: MATH 221 and IE 372. CE-380-1-0908

CE 411. Route Location and Design. (4) I, II. Transportation systems; highway location and the geometric design of streets and highways considering the driver-vehicle-roadway system characteristics; curves and earthwork; surveying pertaining to the alignment of highways and railways. Two hours rec. and six hours lab a week. Pr.: CE 212, MATH 221, and PHYS 213. CE-411-I-0908

CE 499. Honors Research In Civil Engineering. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. CE-499-4-0904

Undergraduate and graduate credit in minor field

CE 522. Soil Mechanics I. (3) I, II. Identification, classification, and engineering properties of soils; theory and application of consolidation, compressibility, and strength of soils; ground water retention and movement; slope stability and lateral earth pressures; stress distribution in soil. Two hours rec. and three hours lab a week. Pr.: CE 533. CE-522-1-0908

CE 528. Foundation Engineering. (3) I. Prediction of soil variation; soil investigations; stress distribution and bearing capacity; dewatering analysis and procedures; retaining structures and lateral earth pressures; shallow foundations, pile foundations; underpinning and grouting. Two hours rec. and three hours lab a week. Pr.: CE 522. Pr. or conc.: CE 544. CE-528-1-0908

CE 530. Statics and Dynamics. (4) I, II. A shortened combined course in (1) statics, including a study of force systems, free-body diagrams, and problems in equilibrium, friction, centroids, and moments of inertia; and (2) dynamics, including a study of the kinematics and kinetics of particles and rigid bodies using the methods of force-mass acceleration, work-energy, and impulse-momentum. Four hours rec. a week. Pr.: MATH 222 and PHYS 213. CE-530-0-0999

CE 533. Mechanics of Materials. (3) I, II. Elementary theories of stress and strain, behavior of materials, and applications of these theories and their generalizations to the study of stress distribution, deformation, and instability in the simple structural forms which occur most frequently in engineering practice. Three hours rec. a week. Pr.: CE 333 or 530. Pr. or conc.: MATH 222. CE-533-0-0999

CE 534. Mechanics of Materials Laboratory. (1) I, II. Determination of selected mechanical properties of several engineering materials, including iron-carbon alloys, aluminum alloys, concrete, wood, and plastics; relationship between structure and mechanical properties of these materials; elementary problems in experimental stress analysis and structural behavior; test procedures, instrumentation, and interpretation of results. One hour lab instruction and two hours lab a week. Pr. or conc.: CE 533. CE-534-1-0999

CE 537. Introduction to Structural Analysis. (4) I, II. Elastic analysis of determinate and indeterminate beams, frames, and trusses; construction of shear and moment diagrams and influence lines; calculation of deflections using conjugate beam and virtual work; solution of indeterminate structures by consistent deformation, slope-deflection, moment distribution, and matrix stiffness method; with microcomputer applications. Four hours rec. a week. Pr.: CE 533. Pr. or conc.: CE 380. CE-537-0-0908

CE 542. Structural Engineering In Steel. (3) II. Introduction to design of steel structures. Theoretical, experimental, and practical bases for proportioning members and their connections. Two hours rec. and three hours lab a week. Pr.: CE 537. CE-542-1-0908

CE 544. Structural Engineering In Concrete. (3) I. A study of the theories of reinforced concrete and of its characteristics as a construction material; design of reinforced concrete structures. Two hours rec. and three hours lab a week. Pr.: CE 537. CE-544-1-0908

CE 551. Hydrology. (2) I, II. A study of the sources of supply and movement of underground and surface waters. Two hours rec. a week. Pr.: PHYS 113 or 213. Cross-listed with AE 551. CE-551-0-0908

CE 552. Hydraulic Engineering. (3) II. Applications of the principles of fluid mechanics to control and use of water; reservoir, dam, and spillway design; enclosed conduit and open-channel design; hydraulic machinery and hydro-power development; principles of fluid measurement; laboratory-flow and velocity metering, hydraulic models, pipe losses, open-channel flow. Two hours rec. and three hours lab a week. Pr.: ME 571. Pr. or conc.: CE 551. CE-552-1-0908

CE 553. Hydrologic Methods Laboratory. (1) I, II. Application of hydrologic methods in design; precipitation data analysis; evapotranspiration; streamgauging; hydrograph generation and flood routing; rainfall and flood frequency analysis; design of multipurpose reservoirs; ground water flow analysis and water well design. Three hours lab a week. Pr. or conc.: CE 551 and NE 385. CE-553-1-0908

CE 563. Environmental Engineering Fundamentals. (3) I, II. Basic physical, chemical, and biological concepts and their applications to the protection of the environment with emphasis on techniques used in water and wastewater treatment. Two hours rec. and three hours lab a week. Pr.: CHM 230. CE-563-1-0908

CE 565. Water and Wastewater Engineering. (3) II. Design of water supply and waste treatment control facilities, including collection, storage, treatment, and distribution systems. Two hours rec. and three hours lab a week. Pr.: CE 563 and PHYS 114 or 214. CE-565-1-0908

CE 570. Transportation Planning. (3) Intersession. Fundamentals of transportation planning. Historical development and current status of techniques used in travel demand forecasting; trip generation, trip distribution, mode choice, and traffic assignment. Current microcomputer models and applications. Pr.: CE 380 or equivalent and junior standing. CE-570-1-0908

CE 572. Highway Engineering and Management. (3) I. Applications of the principles of highway planning, design, and capacity analysis techniques to analyze, design, and maintain street and highway systems. Assessment of the impact of activity center development or redevelopment on the surrounding surface transportation system. Two hours rec. and three hours lab a week. Pr.: CE 411 and 522. CE-572-1-0908

CE 585. Civil Engineering Project. (1-3) I, II. A comprehensive civil engineering project. Requires integration of skills acquired in civil engineering elective courses. Students must prepare and present written and oral design reports. One hour rec. and two three-hour labs a week. Pr.: ENGL 415 and 6 hours of CE electives. Pr. or conc.: Six additional credit hours of CE electives. CE-585-2-0908

Undergraduate and graduate credit

CE 620. Geological Engineering. (3) II. Application of geology and civil engineering in the design of subsurface exploration programs; excavation and evaluation of construction materials; regional planning and environmental policy; rock slopes; foundations on rock. Legal liability and selected case studies will be included. Two hours rec. and three hours lab a week. Pr.: CE 528. Pr. or conc.: GEOL 530. CE-620-0-0908

CE 641. Civil Engineering Materials. (3) I. Properties and behavior of structural metals, timber, portland cement concrete, and bituminous concrete; standard specifications and methods of test; inspection and control; long-term protection and durability. Two hours rec. and three hours lab a week. Pr.: CE 534 and ENGL 415. Pr. or conc.: either CE 528 or 542 or 544. CE-641-1-0908

- CE 675. Traffic Engineering I.** (3) II. Driver, vehicle, and roadway characteristics; speed and volume studies; congestion and accident studies; signs, signals, and pavement marking as traffic control devices; parking studies, screenline and corridor analyses; highway and intersection capacity. Two hours rec. and three hours lab a week. Pr.: CE 572. CE-675-I-0908
- CE 680. Economics of Design and Construction.** (3) II. Selection of alternative engineering design and construction solutions through study of unit cost determination, cost estimating, and financing procedures. Introduction to construction scheduling. Three hours rec. a week. Pr.: Senior standing in engineering or graduate standing for nonengineering majors. CE-680-0-0908
- CE 686. Regional Planning Engineering.** (3) I. Engineering problems involved in regional planning; the design and location of streets and highways, water supply and sanitary facilities, drainage and public utilities; rights-of-way and easement. Two hours rec. and three hours lab a week. Pr.: Senior standing in engineering or graduate standing in regional and community planning. CE-686-I-0908
- CE 718. Engineering Photo Interpretation.** (3) II. Photo interpretation techniques, types of aerial photographic film and their uses; application in land use studies, land surveying, site selection, rainfall runoff and stream flow, location of construction materials, and in the determination of soil properties; other applications. Two hours rec. and three hours lab a week. Pr.: Senior standing and consent of instructor. CE-718-I-0908
- CE 722. Soil Mechanics II.** (3) I. Review of identification, classification, and engineering properties of soils; stress distribution in the soil; advanced study of strength and compressibility of soil, and of soil moisture and ground water movement. Three hours rec. a week. Pr.: CE 522. CE-722-0-0908
- CE 724. Advanced Soil Testing for Engineering Purposes.** (3) II. Physical characteristics and classification of soil materials; consolidation and compressibility tests; unconfined, direct, and triaxial shear tests. One hour rec. and six hours lab a week. Pr.: CE 522. CE-724-I-0908
- CE 728. Advanced Foundation Engineering.** (3) II. Advanced studies of soil investigations; analysis and design of retaining structures, shallow foundations, pile foundations, and dewatering systems; analysis and repair of failed structures; legal aspects of foundation engineering. Two hours rec. and three hours lab a week. Pr.: CE 544 and 528. CE-728-I-0908
- CE 730. Advanced Mechanics of Materials.** (3) I. Introduction to advanced problems in the elastic regime. Biaxial stress and strain, theories of failure, flexure, torsion, membrane theory of shells, beams on elastic foundations, thick cylinders and rotating disks, energy methods, and buckling. Three hours rec. a week. Pr.: CE 533 and MATH 240. CE-730-0-0999
- CE 732. Advanced Structural Analysis I.** (3) I. Classical methods of analysis of statically indeterminate structures; deflections and influence lines for indeterminate structures; analysis of space frames and trusses. Three hours rec. a week. Pr.: CE 537. CE-732-0-0908
- CE 733. Advanced Structural Analysis II.** (3) II. Application of matrix methods of analysis to complex structures; selected topics in structural analysis. Three hours rec. a week. Pr.: CE 537. CE-733-0-0908
- CE 735. Numerical Solutions in Structural Mechanics.** (3) I. In alternate years. Theory of finite element, finite difference, numerical integration and other numerical techniques, and application to problems in structural mechanics. Three hours rec. a week. Pr.: CE 537. CE-735-0-0908
- CE 736. Energy Methods in Engineering Mechanics.** (3) II. In alternate years. The principle of virtual work, minimum potential energy; theorem of complementary energy; Castigliano's theorems; application of statically determinate and indeterminate beams, curved beams, and frames; extension of energy principles of statics to dynamic problems. Three hours rec. a week. Pr.: CE 533. CE-736-0-0999
- CE 737. Elastic Stability.** (3) II. In alternate years. Bending of prismatic bars under simultaneous action of axial and lateral loads; buckling of centrally compressed bars; buckling of compressed rings and curved bars; lateral buckling of beams. Three hours rec. a week. Pr.: CE 533 and MATH 240. CE-737-0-0999
- CE 742. Advanced Steel Design.** (3) II. Plastic design of steel structures; stability problems in plastic design; design of complex steel structures. Three hours rec. a week. Pr.: CE 542. CE-742-0-0908
- CE 743. Advanced Reinforced Concrete Theory.** (3) II. Advanced theories and methods of design and analysis of reinforced concrete structures. Three hours rec. a week. Pr.: CE 544. CE-743-0-0908
- CE 744. Prestressed Concrete Design.** (3) I. The study of prestressing methods and their application to the design of concrete structures. Three hours rec. a week. Pr.: CE 544. CE-744-0-0908
- CE 751. Hydraulics of Open Channels.** (3) I. Properties of open-channel flow; types of open channels; conservation of mass, momentum, and energy; critical, uniform, and gradually varied flow; design of erodible channels; rapidly varied flow. Three hours rec. a week. Pr.: CE 552. CE-751-0-0908
- CE 752. Advanced Hydrology.** (3) II. Review of basic principles; point and regional rainfall and flood frequency analyses; hydrologic and hydraulic flood routing; drainage and flood control facilities design; hydrologic modeling and simulation; flood plain analysis and planning. Three hours rec. a week. Pr.: CE 551. CE-752-0-0908
- CE 761. Environmental Engineering Chemistry.** (3) I. Basic concepts of chemical reaction kinetics and equilibria, acid-base chemistry, complex formation, precipitation and dissolution processes, and applications to environmental engineering; organic compounds in the environment. Three hours rec. a week. Pr.: CE 563 or consent of instructor. CE-761-0-0908
- CE 762. Water Treatment Systems.** (3) II. Drinking water quality and health effects; in-depth study of physical and chemical principles in water treatment unit operations, and their application to plant design. Three hours rec. a week. Pr.: CE 565, 761, or consent of instructor. CE-762-0-0908
- CE 763. Water Supply and Wastewater Collection.** (3) II. Alternate years. Analysis and design of water distribution systems, pump stations, and storage systems; flow measurement devices; analysis and design of wastewater collection systems and pump stations. Three hours rec. a week. Pr.: CE 552, 565, or consent of instructor. CE-763-0-0908
- CE 766. Wastewater Engineering I: Biological Processes.** (3) I. Principles of biological treatment of wastewater and sludge; application to the design of facilities for organics and nutrient removal; sludge handling, treatment, and disposal. Three hours rec. a week. Pr.: CE 565 or permission of instructor. CE-766-0-0908
- CE 767. Wastewater Engineering II: Physical and Chemical Processes.** (3) II. In alternate years. Physical and chemical principles in the removal of suspended solids, organics, and nutrients using sedimentation, filtration, chemical precipitation, oxidation, adsorption, ion-exchange, and other processes. Three hours rec. a week. Pr.: CE 565, 761, or permission of instructor. CE-767-0-0908
- CE 771. Urban Transportation Analysis.** (3) II. Origin-destination surveys, land-use inventories, parking and transit studies; arterial street standards and operating characteristics, coordination of city planning. Two hours rec. and three hours lab a week. Pr.: CE 571 or consent of instructor. CE-771-I-0908
- CE 773. Airport Design.** (3) II. On sufficient demand. Problems encountered in planning, design, construction, and maintenance of large airports. Two hours rec. and three hours lab a week. Pr.: CE 571. CE-773-I-0908
- CE 774. Pavement Design.** (3) I. On sufficient demand. Methods of evaluating the load-carrying capacity of soil subgrade, subbase, and base courses; critical analysis of the methods of design for flexible and rigid pavements; methods of increasing the load-carrying capacity of highway and airport pavements. Two hours rec. and three hours lab a week. Pr.: CE 522. CE-774-I-0908
- CE 790. Problems in Civil Engineering.** (Var.) I, II, S. Pr.: Approval of instructor. CE-790-3-0908
- ### Graduate credit
- CE 791. Research in Civil Engineering.** (Var.) I, II, S. Original investigation or advanced study in some field related to the practice of civil engineering. Pr.: Approval of department head. CE-791-3-0908
- CE 822. Soil Mechanics of Embankments.** (3) I. Application of soil mechanics to cutting and filling operations for the construction of embankments, soil investigations, slope stability, stability and settlement of embankments, structures in embankments. Water control in and through embankments. Two hours rec. and three hours lab a week. Pr. or conc.: CE 722. CE-822-I-0908
- CE 823. Engineering Properties of Cohesive Soils.** (3) I. Mineralogy and structures of clay minerals; fabric and bonding of the clay particles; compressibility and strength characteristics of clays; moisture effects, retention, and movement through clay. Two hours rec. and three hours lab a week. Pr. or conc.: CE 722. CE-823-I-0908
- CE 835. Structural Dynamics.** (3) I. In alternate years. Analysis of structures subjected to dynamic loading. Three hours rec. a week. Pr.: CE 735. CE-835-0-0908
- CE 838. Theory of Plates and Shells.** (3) I. In alternate years. Equations for bending of thin plates, symmetrical bending of circular plates, simply supported rectangular plates; rectangular plates with various edge conditions, plates of various shapes. Membrane theory for cylindrical shells, shells of revolution, other shells. Introduction to bending theory of shells. Three hours rec. a week. Pr.: CE 730. CE-838-0-0999
- CE 849. Design of Shell Structures.** (3) II. In alternate years. Review of membrane theory and bending theory for cylindrical shells, shells of revolution, and folded plate shells. The design of reinforced concrete shell structures. Three hours rec. a week. Pr.: CE 838. CE-849-0-0908
- CE 854. Analysis of Groundwater Flow.** (3) II. Principles of flow through porous media; applications of flow theory to well analysis and design; groundwater resource evaluation and regional groundwater systems analysis. Three hours rec. a week. Pr.: CE 552. CE-854-0-0908
- CE 875. Traffic Engineering II.** (3) II. Theory of traffic flow; design of traffic control devices and signal systems; application of statistical methods to traffic engineering problems. Two hours rec. and three hours lab a week. Pr.: CE 675. Pr. or conc.: STAT 510. CE-875-I-0908
- CE 890. Graduate Seminar in Civil Engineering.** (0) I, II. Discussion of current advances and research in civil engineering. One hour seminar biweekly. Pr.: none. CE-890-4-0908
- CE 898. Master's Report.** (Var.) I, II, S. Topics selected with approval of major professor and department head. CE-898-4-0908
- CE 899. Master's Thesis.** (Var.) I, II, S. Topics selected with approval of major professor and department head. CE-899-4-0908

CE 916. Advanced Topics in Civil Engineering. (Var.) I, II, S. On sufficient demand. A course reserved for study of current topics in civil engineering. Topics announced when offered. Pr.: Eighteen hours graduate credit in areas approved by instructor. CE-916-0-0908

CE 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. CE-999-4-0908

Electrical and Computer Engineering

David L. Soldan, Head

Professors Carpenter,* S. Dyer,* Gallagher,* Hummels,* Johnson,* Lenhart,* Lucas,* Rathbone,* and Soldan,* Associate Professors Devore,* Dollar, R. Dyer,* Fowler,* Harms,* Pahwa,* and Rys;* Assistant Professors Chandra,* Gordon, and Morcos;* Instructor Wakabayashi; Emeriti: Professors Cottom, Haft, Hunt, Kirmser, Koepsel, and Ward.

Undergraduate study

Electrical and computer engineers are involved in the design of electrically oriented systems for a range of applications in modern society. These systems or circuits range from miniature microprocessors through energy conversion systems to giant communication networks and super computers. The electrical or computer engineer is involved in every phase of the transmission, conversion, and processing of energy and information for useful purposes both in industry and in our homes.

Opportunities exist for baccalaureate degree holders to continue education at advanced degree levels or to enter such fields as medicine, law, or business administration.

The first two years of the electrical engineering and the computer engineering curricula are primarily mathematics and physical sciences. These two years prepare the student for the advanced work to be undertaken in the junior and senior years. In the third year, the student begins the study of fundamental concepts of electrical analysis and modeling. Together with experimental studies and techniques, the modeling forms an important aspect of laboratory work. In the fourth and final year, the student's understanding is broadened by the introduction of various aspects of systems and electrical or computer engineering design.

In the last three semesters of the electrical engineering curriculum, students may choose technical electives for a broad or specialized field of study. Specialized areas include bioengineering, communication systems, control systems, computers and digital systems, signal processing, electrical power systems, circuits and electronics, and advanced degree preparation.

The computer engineering curriculum is a new program that has been developed from the computer engineering option in the electrical engineering curriculum. The curriculum leads to the bachelor of science in computer engineering. The new curriculum retains much of the traditional electrical engineering program, but has been adjusted to place increased emphasis on the computer and related computing equipment. The curriculum includes preparation in both computer hardware and software. Emphasis is on the design of computers and computing systems and the related applications.

Through the four years, the student is individually advised and counseled by the faculty. At various times during the year, engineers from industry are invited to the University to speak to the students on topics of current interest to the profession.

Graduate study

Major work is offered in programs of study leading to the master of science and doctor of philosophy degrees with specialization in signal processing, communications, bioengineering, computer engineering, instrumentation, control systems, electromagnetics, solid state electronics, and electric energy systems.

Special facilities available for graduate research include a computer and signal processing laboratory, an instrumentation and control laboratory, an automatic testing laboratory, a communications laboratory, a bioengineering laboratory, an energy systems laboratory, and an integrated circuits laboratory. Computing facilities include a range of mini- and microcomputers within the department as well as College of Engineering and University computing centers.

Students who pursue the M.S. program in electrical or computer engineering are generally B.S. graduates in electrical or computer engineering from an accredited program. However, students with undergraduate degrees from other disciplines wishing to enter the M.S. program are encouraged to apply. The need to take additional undergraduate courses will be decided on an individual basis by the Graduate Affairs Committee of the Department of Electrical and Computer Engineering.

Curriculum in electrical engineering (EE)

Bachelor of science in electrical engineering
135 hours required for graduation
Accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology

Freshman

Fall semester

| | | |
|----------|----------------------------------|-----------|
| ENGL 100 | English Composition I* | 3 |
| CHM 210 | Chemistry I | 4 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| SPCH 105 | Public Speaking IA | 2 |
| ECON 110 | Economics I | 3 |
| | | 16 |

Spring semester

| | | |
|----------|--|-----------|
| CHM 230 | Chemistry II | 4 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| CIS 211 | FORTRAN | 1 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| PE 101 | Principles of Physical Fitness | 1 |
| | Humanities or social science electives | 3 |
| | | 15 |

Sophomore

Fall semester

| | | |
|----------|--|-----------|
| PHYS 213 | Engineering Physics I | 5 |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| EECE 241 | Introduction to Computer Engineering | 3 |
| CHE 350 | Engineering Materials | 2 |
| | Humanities or social science electives | 3 |
| | | 17 |

Spring semester

| | | |
|----------|--|-----------|
| PHYS 214 | Engineering Physics II | 5 |
| MATH 240 | Elementary Differential Equations | 4 |
| CE 333 | Statics | 3 |
| EECE 510 | Circuit Theory I | 3 |
| | Humanities or social science electives | 3 |
| | | 18 |

Junior

Fall semester

| | | |
|----------|--|-----------|
| EECE 511 | Circuit Theory II | 3 |
| EECE 525 | Electronics I | 3 |
| EECE 501 | Electrical Engineering Lab I | 2 |
| ME 512 | Dynamics | 3 |
| STAT 510 | Introduction to Probabilities and Statistics | 3 |
| | Humanities or social science electives | 3 |
| | | 17 |

Spring semester

| | | |
|----------|--------------------------------------|-----------|
| EECE 526 | Electronics II | 3 |
| EECE 581 | Energy Conversion I | 3 |
| EECE 502 | Electrical Engineering Lab II | 2 |
| ENGL 415 | Written Communication for Engineers* | 3 |
| EECE 512 | Linear Systems | 3 |
| EECE 557 | Electromagnetic Theory I | 4 |
| | | 18 |

Senior

Fall semester

| | | |
|----------|-------------------------|-----------|
| ME 513 | Thermodynamics I | 3 |
| EECE 530 | Control Systems Design | 3 |
| | Option electives | 6 |
| | Complementary electives | 6 |
| | | 18 |

Spring semester

| | | |
|----------|--|-----------|
| EECE 590 | Seminar | 1 |
| | Option electives | 3 |
| | Complementary electives | 9 |
| | Humanities or social science electives | 3 |
| | | 16 |

*The prerequisite for ENGL 415 is satisfied with an A or B in ENGL 100. Otherwise the student must take

ENGL 120 which, if necessary, may be substituted for 3 credit hours of complementary electives.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum. (Two courses must be 400 level or above.)

Nine semester hours of option electives must be selected from electrical and computer engineering courses upon consultation with the student's faculty advisor.

Fifteen semester hours of complementary electives must be selected from an approved list of complementary electives upon consultation with the student's faculty advisor. The complementary electives may include a maximum of 6 semester hours from electrical and computer engineering courses (10 hours for honors students.)

In fulfillment of the 24 semester hours of option and complementary electives, at least one course must be selected from the approved list of senior-level design courses and one course from the approved list of senior-level laboratory courses.

Electrical engineering options

General

In the general option a set of specializations is possible. The student is expected to select a set of interrelated courses which will allow concentration in one area. Examples of such areas are communication systems, digital systems, circuits and electronics, instrumentation, solid state devices, microwaves, control systems, signal and image processing, and electrical power systems.

Bioengineering

A student pursuing the option of bioengineering within the Department of Electrical and Computer Engineering can fulfill the requirements for a B.S. in electrical engineering by following the outlined core curriculum listed for electrical engineering. A listing of courses that support the life science component of the bioengineering option follows:

| | | |
|-----------|------------------------------------|---|
| CHM 531 | Organic Chemistry I | 3 |
| CHM 532 | Organic Chemistry Lab | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 505 | Comparative Anatomy of Vertebrates | 4 |
| BIOL 526 | Human Physiology | 3 |
| AP 530 | Anatomy and Physiology | 4 |

The selected courses from the above list will be used as complementary electives in the electrical engineering curriculum. As a minimum, the student should select a physiology course and, if possible, additional electives in the chemistry area.

Computer engineering (CMPEN)

Bachelor of science in computer engineering
135 hours required for graduation

Freshman

| | | |
|----------------------|--------------------------------------|-----------|
| Fall semester | | |
| ENGL 100 | English Composition I* | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| CHM 210 | Chemistry I | 4 |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS 207 | PASCAL Language Lab | 2 |
| | | 16 |

Spring semester

| | | |
|---------------------------------------|--------------------------------------|-----------|
| SPCH 105 | Public Speaking IA | 2 |
| ECON 110 | Economics I | 3 |
| MATH 221 | Analytic Geometry and Calculus II | 4 |
| EECE 241 | Introduction to Computer Engineering | 3 |
| CIS 211 | FORTTRAN Lab | 1 |
| Humanities or social science elective | | 3 |
| | | 16 |

Sophomore

Fall semester

| | | |
|---------------------------------------|------------------------------------|-----------|
| PHYS 213 | Engineering Physics I | 5 |
| MATH 222 | Analytic Geometry and Calculus III | 4 |
| CIS 300 | Algorithms and Data Structures | 3 |
| EECE 444 | Computer Engineering Lab I | 1 |
| Humanities or social science elective | | 3 |
| | | 16 |

Spring semester

| | | |
|---------------------------------------|-----------------------------------|-----------|
| PHYS 214 | Engineering Physics II | 5 |
| MATH 240 | Elementary Differential Equations | 4 |
| MATH 510 | Discrete Mathematics | 3 |
| EECE 510 | Circuit Theory I | 3 |
| Humanities or social science elective | | 3 |
| | | 18 |

Junior

Fall semester

| | | |
|----------|---|-----------|
| CIS 500 | Analysis of Algorithmic and Data Structures | 3 |
| EECE 511 | Circuit Theory II | 3 |
| EECE 525 | Electronics I | 3 |
| STAT 510 | Introductory Probability and Statistics I | 3 |
| EECE 641 | Design of Digital Systems I | 3 |
| EECE 501 | Electrical Engineering Lab I | 2 |
| | | 17 |

Spring semester

| | | |
|---------------------------------------|-----------------------------------|-----------|
| EECE 512 | Linear Systems | 3 |
| EECE 557 | Electromagnetic Theory I | 4 |
| EECE 636 | Introduction to Computer Graphics | 3 |
| EECE 649 | Computer Design I | 3 |
| EECE 544 | Computer Engineering Lab II | 2 |
| Humanities or social science elective | | 3 |
| | | 18 |

Senior

Fall semester

| | | |
|---------------------------------------|--------------------------------------|-----------|
| CE 530 | Statics and Dynamics | 4 |
| EECE 645 | Digital Electronics | 3 |
| ENGL 415 | Written Communication for Engineers* | 3 |
| EECE 631 | Microcomputer Systems Design | 3 |
| Humanities or social science elective | | 3 |
| | | 16 |

Spring semester

| | | |
|-------------------------|------------------------|-----------|
| EECE 530 | Control Systems Design | 3 |
| EECE 590 | Seminar | 1 |
| CIS 520 | Operating Systems I | 3 |
| Complementary electives | | 11 |
| | | 18 |

*The prerequisite for ENGL 415 is satisfied with an A or B in ENGL 100. Otherwise the student must take ENGL 120 which, if necessary, may be substituted for 3 credit hours of complementary electives.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum. (Two courses must be 400 or above.)

Complementary electives must include an approved engineering science course in either engineering materials, thermodynamics, or flow and rate processes.

Courses in electrical and computer engineering

Undergraduate credit

EECE 241. Introduction to Computer Engineering. (3) I, II, S. Simple coding schemes, Boolean algebra fundamentals, elements of digital building blocks such as gates, flip-flops, shift registers; memories, etc., basic engineering aspects of computer architecture and elements of machine language. Three hours rec. a week. Pr. or conc.: CIS 200. EECE-241-0-0909

EECE 444. Computer Engineering Laboratory I. (1) I, II. Laboratory experience in design, construction, and debugging of simple digital systems and subsystems. Three hours lab a week. Pr.: EECE 241. EECE-444-1-0909

EECE 499. Honors Research in Electrical and Computer Engineering. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. EECE-499-4-0909

Undergraduate and graduate credit in minor field

EECE 501. Electrical Engineering Laboratory I. (2) I, II. Electrical engineering laboratory experiments on topics selected from and correlated with the concurrent or prerequisite courses. Three hours lab a week. Pr.: EECE 241 and 510. Pr. or conc.: EECE 511 and 525. EECE-501-1-0909

EECE 502. Electrical Engineering Laboratory II. (2) I, II. Continuation of Electrical Engineering Laboratory I. Three hours lab a week. Pr.: EECE 501, 511, and 525. Pr. or conc.: EECE 526. EECE-502-1-0909

EECE 510. Circuit Theory I. (3) I, II, S. An introduction to linear circuit theory; analysis of linear circuits containing resistance, inductance, and capacitance. Three hours rec. a week. Pr.: CIS 200, 211, MATH 222, and PHYS 213. EECE-510-0-0909

EECE 511. Circuit Theory II. (3) I, II, S. Analysis of electric circuits using differential equations, state equations, transform techniques and linear algebra. Three hours rec. a week. Pr.: PHYS 214, MATH 240, and EECE 510. EECE-511-0-0909

EECE 512. Linear Systems. (3) I, II. An introduction to linear system fundamental concepts and analytical methods. Analytical concepts presented are signal representation and classification, statistical parameters, convolution, Fourier analysis signal sampling, and discrete transforms. Three hours rec. a week. Pr.: EECE 511 and STAT 510. EECE-512-0-0909

EECE 519. Electric Circuits and Control. (4) I, II. Principles of direct-current circuits and machines, alternating-current circuits and machines, electronics, and application to instrumentation and control. Four hours rec. a week. Not open to EECE students. Pr.: PHYS 214. EECE-519-0-0909

EECE 525. Electronics I. (3) I, II. Fundamentals of electronic components, devices, and circuits. Three hours rec. a week. Pr.: EECE 510 or 519 or ET 530. EECE-525-0-0909

EECE 526. Electronics II. (3) I, II. Continuation of Electronics I. Three hours rec. a week. Pr.: EECE 511 and 525. EECE-526-0-0909

EECE 530. Control Systems Design. (3) I, II. Modeling, analysis, and design of control systems. Three hours rec. a week. Pr.: EECE 512. EECE-530-0-0909

EECE 544. Computer Engineering Laboratory II. (2) I, II. Practical aspects of digital systems design, including the design and operation of small computer systems. Three hours lab a week. Pr.: EECE 444 and 501. Pr. or conc.: EECE 557 and 649. EECE-544-1-0909

EECE 557. Electromagnetic Theory I. (4) I, II. Vector analysis, electrostatics, magnetostatics, Faraday's Law, Maxwell's Equations, transmission lines, and applications. Four hours rec. a week. Pr.: PHYS 214 and EECE 510. EECE-557-0-0909

EECE 581. Energy Conversion I. (3) I, II. Energy conversion principles and their application to electric energy converters operating in the static and the dynamic mode. Three hours rec. a week. Pr.: EECE 510. Pr. or conc.: EECE 557. EECE-581-0-0909

EECE 589. Circuits and Machines Lab. (2) I, II. Practical aspects of electrical circuits, transformers, and electrical motors and generators. One hour lec. and two hours lab a week. Not open to EECE students. Pr.: EECE 519. EECE-589-1-0909

EECE 590. Seminar. (1) I, II. Preparation and oral presentation of a written technical report. One hour rec. a week. Pr.: ENGL 415. EECE-590-0-0909

Undergraduate and graduate credit

EECE 603. Advanced Electrical Engineering Laboratory. (2) I, II. A project-oriented laboratory in which a small group of students works with a faculty member in a special area of interest. Projects usually involve design, measurement methods, or experimental work. May be repeated once. Pr.: EECE 502. EECE-603-1-0909

EECE 624. Power Electronics. (3) I. Theory and application of semiconductor devices to the control and conversion of electric power, control of DC and AC machines, design of electronic power circuits such as inverters, controlled rectifiers, and choppers using diodes, diacs, thyristors, triacs, and power transistors. Three hours rec. a week. Pr.: EECE 581 and 512. Pr. or conc.: EECE 526. EECE-624-0-0909

EECE 625. Integrated Circuits Engineering. (3) II. An introduction to the major processes used in the design and fabrication of integrated circuits. Two hours rec. and three hours lab a week. Pr.: Consent of instructor. EECE-625-1-0909

EECE 627. Communication Electronics. (3) I. An introduction to analog communication systems. Includes amplitude modulation (AM) and frequency modulation (FM) by analog signals and the determination of signal-to-noise ratio in AM and FM systems. Design of simple oscillators, modulators, mixers, and detectors. Three hours rec. a week. Pr. or conc.: EECE 512. EECE-627-0-0909

EECE 628. Electronic Instrumentation. (3) I, II. Applications of electronics in the design of analog and digital systems for the measurement of physical variables and in the transduction of these variables into a useful form for both recording and control. Two hours rec. and three hours lab a week. Pr.: EECE 502 and 526. EECE-628-1-0909

EECE 631. Microcomputer Systems Design. (3) I, II. Engineering application of microcomputers to instrumentation, control, and communications. Two hours rec. and three hours lab a week. Pr.: EECE 241, 525 or equiv., and CIS 200. EECE-631-1-0909

EECE 632. Engineering Applications of Microcomputer Systems. (3) I. Elements of digital building blocks and number systems. Computer systems organization, memories, microcomputer fundamentals. Applications of microcomputer systems. Not available for students with credit for EECE 241. Two hours rec. and three hours lab a week. Pr.: PHYS 214; high-level programming language. EECE-632-1-0909

EECE 636. Introduction to Computer Graphics. (3) I, II. An introduction to the hardware and software aspects of graphics generation. Programming assignments will provide practical experience in implementing and using standard graphics primitives and user interfaces. Three hours rec. a week. Pr.: CIS 300. Same as CIS 636. EECE-636-0-0909

EECE 641. Design of Digital Systems I. (3) I, II. Design of combinational and sequential circuits, computer subsystems, and peripheral interfaces. Emphasis is placed on nonideal digital device phenomena, electromagnetic interference, radio frequency interference, shielding, and timing. Three hours rec. a week. Pr.: EECE 444 and 510, CIS 200. EECE-641-0-0909

EECE 642. Design of Digital Systems II. (3) On sufficient demand. Hardware aspects pertaining to special purpose counters, computer input-output devices, A-D and D-A conversion, magnetic memory devices and systems, clocks, and interfacing. Three hours rec. a week. Pr.: EECE 645 and 641. EECE-642-0-0909

EECE 645. Digital Electronics. (3) I, II. The characteristics and performance of the major contemporary digital logic families. Three hours rec. a week. Pr.: EECE 525 and 557. EECE-645-0-0909

EECE 646. Fault Diagnosis in Digital Systems. (3) On sufficient demand. Hazards, fault detection in combinatorial circuits, and sequential machines using path-sensitizing and fault-matrix methods, state table analysis, etc.; system reliability through logical redundancy. Three hours rec. a week. Pr. or conc.: EECE 641. EECE-646-0-0909

EECE 647. Digital Filtering. (3) I. Difference equation characterization of digital filters, transient and steady-state analysis of digital filters using the Z-transform, spectral analysis of digital signals, design and implementation of digital filters. Three hours rec. a week. Pr.: EECE 512. EECE-647-0-0909

EECE 649. Computer Design I. (3) I, II. Basic concepts of computer design. Arithmetic and logic unit design for fixed and floating point operations. Hardwired and microprogrammed control design with emphasis placed on instruction sets and addressing modes. Memory system design including virtual memory organization, caches, and associative memories. I/O design methods, interrupt mechanisms, DMA and I/O processors are covered. Three hours rec. a week. Pr.: EECE 641. EECE-649-0-0909

EECE 659. Wave Guides, Antennas, and Propagation. (3) On sufficient demand. Applications of Maxwell's equations to boundary value problems, guided transmission, cavities, radiation, and propagation. Three hours rec. a week. Pr.: EECE 557. EECE-659-0-0909

EECE 661. Digital Communication Systems. (3) II. An introduction to digital communication systems including modulation, transmission, demodulation, and random noise. Principles of optimum digital receiver design and evaluation of receiver performance are included. Three hours rec. a week. Pr.: EECE 512. EECE-661-0-0909

EECE 662. Design of Communication Circuits. (3) I, II. The design and performance testing of common communication circuits. Topics include tuned amplifiers, impedance matching, oscillators, filters, transmission lines, and phase locked loops. Two hours rec. and three hours lab a week. Pr.: EECE 526 and 502. EECE-662-1-0909

EECE 663. Digital Error Control Coding. (3) II. An introduction to the subject of error-correcting and error-detecting codes, both block and convolutional. Emphasis is placed on practical means of encoding and decoding the most commonly used codes such as Hamming, BCH, and Reed-Solomon codes. Three hours rec. a week. Pr.: EECE 241, STAT 510, and CIS 211. EECE-663-0-0909

EECE 670. Engineering Applications of Machine Intelligence. (3) II. Study concepts and applications of machine intelligence in functional models of engineering systems. Develop, as a term project, an expert system simulation/model for an engineering system that runs on a personal computer and develop the supporting documentation. Two hours rec. and three hours lab a week. Pr.: CIS 535. EECE-670-1-0909

EECE 681. Wind Engineering. (3) II. Wind characteristics, turbine performance, synchronous and asynchronous electrical loads, siting, economics, open-air testing, rectifiers, and inverters. Three hours rec. a week. Pr.: ME 512; and EECE 525 or 519. EECE-681-0-0909

EECE 682. Energy Conversion II. (3) On sufficient demand. Continuation of EECE 581. Three hours rec. a week. Pr.: EECE 581. EECE-682-0-0909

EECE 685. Modeling, Computer Simulation, and Design of Electric Power Systems. (3) I. A comprehensive study of modeling of the electric power system components and computer simulation of interconnected power systems in steady state. Vector-matrix descriptions are emphasized. Three hours rec. a week. Pr. or conc.: EECE 581. EECE-685-0-0909

EECE 686. Fault Analysis and Protection of Electric Power Systems. (3) II. Analysis of symmetrical and unsymmetrical faults on power systems using symmetrical components technique. Study of protective relaying for protection of power systems against faults. Vector-matrix descriptions and computer solutions are emphasized. Three hours rec. a week. Pr.: EECE 685. EECE-686-0-0909

EECE 690. Problems in Electrical and Computer Engineering. (Var.) I, II, S. EECE-690-3-0909

EECE 695. Solid-State Engineering. (3) I. Elastic, thermal, electric, and magnetic properties of crystals and metals; conduction in metals and semiconductors; solid state devices. Three hours rec. a week. Pr.: EECE 525, 557, and CHE 350. EECE-695-0-0909

EECE 696. VLSI Circuit Design. (3) I. Study of silicon NMOS and CMOS technologies in contemporary very large scale integrated circuits. The complete design of the circuit and lithographic masks on the Computer Aided Design (CAD) station. Two hours rec. and three hours lab a week. Pr.: EECE 241 and 525. EECE-696-1-0909

EECE 730. Control Systems Analysis and Design. (3) II. Use of classical analysis techniques for control system compensation. State space control theory fundamentals are presented in addition to an introductory treatment of several major systems areas. Three hours rec. a week. Pr.: EECE 530 or ME 640. Same as ME 730. EECE-730-0-0909

EECE 731. Advanced Microcomputer System Design. (3) II. Design and engineering applications of 16 and 32 bit microprocessors. Utilization of peripheral and co-processor chips. Two hours rec. and three hours lab a week. Pr.: EECE 631. EECE-731-1-0909

EECE 736. Discrete-Time and Computer-Control Systems. (3) I. Analysis and design of discrete-time, sampled-data, and computer-control systems using discrete-state equations and Z-transforms. Three hours rec. a week. Pr.: EECE 526, 530, and 581. EECE-736-0-0909

EECE 741. Computer Design II. (3) II. Study of alternate computer hardware structures. Engineering trade-offs in implementation of alternative instruction sets and computing structures, including bit-slice implementations. Simulation of hardware structures. Three hours rec. a week. Pr.: EECE 649. EECE-741-0-0909

EECE 747. Digital Signal Processing Laboratory. (3) II. Digitization of analog signals; demonstration of aliasing problems; spectral analysis of digital signals using Fourier and other signal representation techniques; digital filtering problems; applications related to biomedical and speech data. Two hours lec. and three hours lab a week. Pr.: EECE 512. Pr. or conc.: EECE 647. EECE-747-1-0909

EECE 758. Electromagnetic Theory II. (3) On sufficient demand. Continuation of EECE 557. Three hours rec. a week. Pr.: EECE 557. EECE-758-0-0909

EECE 771. Control Theory Applied to Bioengineering. (3) II. Development of mathematical models used in the study and analysis of physiological control systems providing techniques for varying pertinent biological parameters. Three hours rec. a week. Pr. or conc.: EECE 530 or ME 640, and a basic physiology course. EECE-771-0-0909

EECE 772. Theory and Techniques of Bioinstrumentation. (3) I. Theoretical aspects of biological signals, electrodes, transducers, and processing equipment with emphasis on the acquisition and recording of the responses to electrical potentials, pressure, and flow measurements. Three hours rec. a week. Pr.: EECE 771 or consent of instructor. EECE-772-0-0909

EECE 773. Bioinstrumentation Laboratory. (1) I. Practical experience with and evaluations of laboratory and clinical techniques related to electrodes, transducers, and monitoring equipment. Emphasis is on instrumentation for the respiratory, cardiovascular, and nervous systems. Three hours lab a week. Pr.: Conc. enrollment in EECE 772 and AP 773. EECE-773-1-0909

EECE 791. Matrix Methods Applied to Electrical Engineering. (3) On sufficient demand. Applications of matrices and linear vector spaces to electrical systems. Three hours rec. a week. Pr.: EECE 512. EECE-791-0-0909

Graduate credit

EECE 828. Advanced Topics in Instrumentation. (3) On sufficient demand. Selected topics related to transducer design and characterization, noise reduction in measurement systems, special purpose data acquisition systems. Three hours rec. a week. Pr.: EECE 628. EECE-828-0-0909

EECE 830. Advanced Systems Theory. (3) II. State space description and analysis of continuous and discrete time dynamic systems including optimal control solutions. Both linear and nonlinear systems are considered. Three hours rec. a week. Pr.: EECE 530 or ME 640. EECE-830-0-0909

EECE 840. Computer Engineering Methods for Analysis, Simulation, and Design. (3) I. Computer-aided and numerical techniques applicable to problems in electrical and computer engineering. Emphasis is on implementation of these techniques on the computer. Three hours rec. a week. Pr.: EECE 512. EECE-840-0-0909

EECE 841. Advanced Topics in Computer Engineering. (3) On sufficient demand. Selected topics related to modern developments in computer system design. Special hardware features in computer system design. Special hardware features and structures appearing in larger computer systems or networks. Methods for describing computing hardware. Three hours rec. a week. Pr.: EECE 741. EECE-841-0-0909

EECE 855. Advanced Topics in Electromagnetic Theory. (3) On sufficient demand. Mathematical development of electromagnetic wave theory. Three hours rec. a week. Pr.: EECE 758. EECE-855-0-0909

EECE 861. Noise Theory. (3) I. Study of noise phenomena and measurement; the representation of noise by statistical parameters, the noise factor of undesired noise sources, and the measurement applications of noise generators. Three hours rec. a week. Pr.: EECE 512. EECE-861-0-0909

EECE 863. Signal Detection Theory. (3) I. A study of optimum signal detection principles for analog and digital communication over the linear additive noise channel. Includes series representations for random signals and the derivation of minimum mean square error (MMSE) receivers for AM and FM and maximum likelihood (ML) receivers for FSK, MSK, and M-Ary PSK. Three hours rec. a week. Pr.: EECE 861. EECE-863-0-0909

EECE 865. Information Theory. (3) II. Information as a measure of uncertainty, zero-memory and Markov sources, coding of information sources, channels and mutual information, reliable transmission via unreliable channels, error correcting codes. Three hours rec. a week. Pr.: EECE 661. EECE-865-0-0909

EECE 866. Transform Processing of Digital Signals. (3) II. Orthogonal transforms in digital signal processing with emphasis on one- and two-dimensional signals, generalized Wiener filtering, feature selection in pattern recognition, and elements of adaptive filtering techniques. Three hours rec. a week. Pr.: EECE 861. EECE-866-0-0909

EECE 867. Digital Image Processing. (3) I. Basic concepts and techniques of image formation, representation, analysis, restorations, enhancement, coding, segmentation, and description. Object recognition using shape descriptors and syntactic techniques. Image processing applications in remote sensing, computer vision, and medical diagnosis. Three hours rec. a week. Pr.: EECE 512. EECE-867-9-0909

EECE 868. Advanced Digital Filtering. (3) II. Advanced treatment of the theory, design, and implementation of digital filters; use of digital filters to process random signals. Three hours rec. a week. Pr.: EECE 647 and 861. EECE-868-0-0909

EECE 881. Advanced Topics in Electric Energy Systems. (3) On sufficient demand. Subjects of current interest such as computer methods, distribution and transmission systems, systems planning and economics, extra high voltage transmission, exotic power sources. May be repeated. Three hours rec. a week. Pr.: EECE 686. EECE-881-0-0909

EECE 890. Advanced Electrical Theory. (Var.) I, II. For advanced study in specialized areas by M.S. students. Pr.: M.S. student. EECE-890-3-0909

EECE 897. Research in Electrical Engineering. (Var.) I, II, S. Special research problems in electrical engineering. Pr.: Consent of instructor. EECE-897-4-0909

EECE 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. EECE-898-4-0909

EECE 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. EECE-899-4-0909

EECE 931. Advanced Topics in Control Theory. (3) On sufficient demand. Study of advanced topics in optimal, time-varying, and stochastic control theory, or other recent developments in the control systems area. May be repeated. Three hours rec. a week. Pr.: EECE 830. EECE-931-0-0909

EECE 962. Advanced Topics in Communications. (3) On sufficient demand. Selected topics related to the design and performance analysis of communication systems. Topics may include advanced modulation techniques, optimum receiver design, nonlinear channels, multipath analysis, diversity systems, and others. Three hours rec. a week. Pr.: EECE 861. EECE-962-0-0909

EECE 967. Advanced Topics in Digital Signal Processing. (3) On sufficient demand. Selected topics related to adaptive digital filtering techniques; special purpose hardware for digital filtering; two-dimensional signal processing and classification. Three hours rec. a week. Pr.: EECE 866 or 868. EECE-967-0-0909

EECE 971. Advanced Topics in Bioengineering. (3) On sufficient demand. Study of complex physiological system simulation and analysis techniques, modern experimental and clinical electronic bioinstrumentation systems. Topics selected according to graduate student's interests. May be repeated. Three hours rec. a week. Pr.: EECE 771 or 772. EECE-971-0-0909

EECE 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. EECE-999-4-0909

Engineering Technology

John M. Ulrich, Head

Professors Hoppe and Ulrich; Associate Professors Dawes, Delker, DeVault, and Pacey; Assistant Professors Hague and Hightower.

Area coordinators

Electronic engineering technology
J. DeVault

Mechanical engineering technology
J. Ulrich

Nuclear reactor technology
R. Hightower

Engineering technology is a rapidly growing program which offers excellent career opportunities to young men and women. As members of the engineering team graduates work with engineers, scientists, and craftsmen in coordinated efforts relating to the design, development, and manufacture of products and systems which are needed by society.

While the primary responsibility of the engineer is the creation of new designs, the technologist is involved more in routine design and development; liaison and supervision of craftsmen and technicians; technical sales and service.

The emphasis of the technology program is less theoretical than that for the engineering student. There are more lab courses with an emphasis on hardware and applications.

All areas of specialization are accredited by the Technology Accreditation Commission of the Accreditation Board of Engineering and Technology, except nuclear reactor technology.

Engineering technology (ET)

Bachelor of science in engineering technology
126 semester hours required for graduation

Core courses (64 hours)

| | |
|---------------------------------|--|
| Communications (11) | |
| ENGL 100 | English Composition I 3 |
| ENGL 120 | English Composition II 3 |
| ENGL 415 | Written Communication for Engineers 3 |
| SPCH 105 | Public Speaking IA 2 |
| Physical science (12) | |
| CHM 210 | Chemistry I 4 |
| PHYS 113 | General Physics I 4 |
| PHYS 114 | General Physics II 4 |
| Mathematics and statistics (15) | |
| MATH 100 | College Algebra 3 |
| MATH 150 | Plane Trigonometry 3 |
| MATH 210 | Technical Calculus I 3 |
| MATH 211 | Technical Calculus II 3 |
| STAT 320 | Elements of Statistics 3 |
| Engineering technology (10) | |
| ME 212 | Engineering Graphics I 2 |
| NE 385 | Engineering Computational Techniques 2 |

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|----------|---|----|
| ET 415 | Computer Applications in Engineering Technology | 2 |
| ET 431 | Electrical Circuit Technology I | 4 |
| PE 101 | Principles of Physical Fitness | 1 |
| ECON 110 | Economics I | 3 |
| | Humanities or social science electives | 12 |

Electronic engineering technology

This program is designed to provide the essential background for a career in one of the many areas of the electrical and electronic industries, including liaison and supervision of craftsmen and technicians, routine design and development, production, quality control maintenance, and technical sales.

Area of specialization (62 hours)

| | | |
|-----------------------|-------------------------------------|-------|
| Required courses (43) | | |
| 1E 241 | Production Processes | 3 |
| ET 410 | Properties of Engineering Materials | 2 |
| ET 430 | Electronic Fabrication Lab | 1 |
| ET 436 | Digital Logic Systems I | 4 |
| ET 531 | Electrical Circuit Technology II | 4 |
| ET 533 | Electronic Devices and Systems | 4 |
| ET 536 | Digital Logic Systems II | 4 |
| ET 537 | Electronic Measurements | 4 |
| ET 538 | Digital Peripherals and Interfacing | 4 |
| ET 539 | Electronic Communications | 4 |
| ET 541 | Electronic Design Lab | 2 |
| ET 542 | Electric Motors and Controls | 4 |
| ME 560 | Engineering Economics | 3 |
| | Technical electives | 15-10 |
| | Management electives | 3-8 |
| | Free elective | 1 |

Mechanical engineering technology

Continued industrial growth has resulted in an increasing need for technically trained personnel. The mechanical engineering technologist, a vital member of the engineering team, applies practical approaches to problems in many technical areas.

Area of specialization (62 hours)

| | | |
|-----------------------|--|---|
| Required courses (49) | | |
| CE 231 | Statics A | 3 |
| CE 331 | Strength of Materials A | 3 |
| CE 332 | Strength of Materials A Lab | 1 |
| ET 410 | Properties of Engineering Materials | 2 |
| ET 411 | Properties of Engineering Materials Lab | 1 |
| ET 512 | Mechanics of Fluids | 3 |
| ET 514 | Energy Conversion Technology | 3 |
| ET 532 | Instrumentation and Measurement Technology | 3 |
| ET 534 | Automatic Control Technology | 3 |
| ET 540 | Industrial Microprocessing | 3 |
| ET 560 | Kinematics and Mechanisms | 3 |
| ET 561 | Machine Design | 3 |
| ET 562 | Mechanical Design Lab I | 2 |
| ET 563 | Mechanical Design Lab II | 2 |
| ET 569 | Mechanical Equipment Lab | 2 |
| 1E 241 | Production Processes | 3 |
| ME 217 | Engineering Graphics II | 3 |
| ET 511 | Dynamics A | 3 |
| ME 560 | Engineering Economics | 3 |
| | Technical electives | 6 |
| | Management electives | 6 |
| | Free electives | 1 |

Nuclear reactor technology

This program provides the education necessary for careers associated with assisting engineers in the design, construction, inspection, maintenance, monitoring, and management of nuclear reactor power generation facilities. Primary employment positions are senior reactor operators and shift technical advisors. Other employment opportunities include similar responsibilities in medical and industrial facilities where radioactive materials are used.

Area of specialization (62 hours)

| | | |
|-----------------------|--------------------------------------|----|
| Required courses (48) | | |
| CE 231 | Statics A | 3 |
| CE 331 | Strength of Materials A | 3 |
| CHM 230 | Chemistry II | 4 |
| ET 410 | Properties of Engineering Materials | 2 |
| ET 436 | Digital Logic Systems I | 4 |
| ET 480 | Materials of Nuclear Reactor Systems | 2 |
| ET 481 | Nuclear Reactor Technology I | 3 |
| ET 482 | Nuclear Reactor Technology Analysis | 3 |
| ET 512 | Mechanics of Fluids | 3 |
| ET 514 | Energy Conversion Technology | 3 |
| ET 534 | Automatic Control Technology | 3 |
| ET 537 | Electronic Measurements | 4 |
| ET 583 | Nuclear Reactor Technology II | 3 |
| ET 584 | Radiation Detection and Monitoring | 3 |
| ET 585 | Nuclear Reactor Thermal Technology | 3 |
| ET 586 | Radiation Protection Technology | 2 |
| | Technical electives | 10 |
| | Management electives | 3 |
| | Free elective | 1 |

Courses in engineering technology

Undergraduate credit

ET 410. Properties of Engineering Materials. (2) I, II. Engineering requirements of materials: mechanical, thermal, electrical, and biological properties and behavior of materials. Two hours rec. a week. Pr.: CHM 110 or 210, PHYS 113. ET-410-0-0925

ET 411. Properties of Engineering Materials Lab. (1) I, II. Laboratory experiments supplementing ET 410. Pr. or conc.: ET 410. ET-411-1-0925

ET 415. Computer Applications in Engineering Technology. (2) I, II. Applications of computer techniques to the solution of problems in engineering technology. Includes software package and programming applications. One hour lec. and one hour rec. a week. Pr.: MATH 100 and 150, or CIS 200 with a language lab. ET-415-1-0925

ET 430. Electronic Fabrication Laboratory. (1) I, II. Laboratory experience in the layout, fabrication, and assembly of electronic circuits. Project-oriented with an emphasis on printed circuit boards. Three hours lab a week. Pr. or conc.: PHYS 114. ET-430-1-0925

ET 431. Electrical Circuit Technology I. (4) I, II. DC and AC steady-state circuit analysis. Study of resistance, capacitance, and inductance. Basic magnetic circuits. Polyphase steady-state circuits. Brief study of AC machinery with emphasis on selection and applications. Three hours lec. and three hours lab a week. Pr.: ET 415. Pr. or conc.: PHYS 114 and MATH 211. ET-431-1-0925

ET 436. Digital Logic Systems I. (4) II. Study of logic gates, combinational and sequential logic, Boolean algebra, Karnaugh maps, arithmetic systems, and multiplexing. Three hours rec. and three hours lab a week. Pr.: NE 385. ET-436-1-0925

ET 440. Introduction to Food Engineering Technology. (3) I. Material and energy balances with application to food processing. Fluid flow and heat transfer in food processing. Thermodynamic properties and laws. Conc. enrollment in ET 441 is urged. Three hours rec. a week. Pr.: PHYS 113 or 115, BIOCH 120 or CHM 190, MATH 210 or 205. ET-440-0-0925

ET 441. Introduction to Food Engineering Technology Lab. (1) I. Laboratory experiments supplementing ET 440. Three hours lab a week. Pr. or conc.: ET 440. ET-441-1-0925

ET 480. Materials of Nuclear Reactor Systems. (2) On sufficient demand. The properties and behavior of fuel and nonfuel materials used in nuclear reactor systems are considered. Selected nuclear fuel cycle topics are covered. Two hours rec. a week. Pr.: ET 410. ET-480-0-0925

ET 481. Nuclear Reactor Technology I. (3) On sufficient demand. Introduction to nuclear and neutron physics, including: interaction of neutrons, gamma rays, and beta and alpha particles with matter; production of neutrons and the neutron life cycle; basic neutron diffusion principles; and the nuclear fuel cycle. Three hours rec. a week. Pr.: PHYS 114, STAT 320. ET-481-0-0925

ET 482. Nuclear Reactor Technology Analysis. (3) I. Applied numerical analysis emphasizing solutions of elementary differential equations with a very strong emphasis on applications in nuclear reactor technology. Three hours rec. a week. Pr.: MATH 211 or equiv. ET-482-0-0925

ET 498. Problems in Engineering Technology. Credit arranged. I, II, S. Pr.: Approval of instructor. ET-498-3-0925.

ET 499. Honors Research in Engineering Technology. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. ET-499-4-0925

Undergraduate and graduate credit in minor field

Courses in engineering technology may not be taken for graduate credit by students in the College of Engineering.

ET 511. Dynamics A. (3) I. A study of kinematics and kinetics of particles and rigid bodies. Includes kinematic relations and dynamic principles. Emphasis will be placed on the application of dynamic equations. Computer solutions of dynamic problems will be included. Three hours rec. a week. Pr.: CE 231, MATH 211. ET-511-0-0925

ET 512. Mechanics of Fluids. (3) I. Fluid properties, fluid statics. Fluid dynamics of high and low viscosity fluids including pipe flow, open-channel flow, flow about immersed objects, fluid machinery, and flow measurements. Three hours rec. a week. Pr.: PHYS 113. ET-512-0-0925

ET 514. Energy Conversion Technology. (3) II. Introduction to energy conversion technology, energy, and power; thermodynamics, power cycles, and refrigeration. Three hours rec. a week. Pr.: CHM 110 or 210, and PHYS 113. ET-514-0-0925

ET 531. Electrical Circuit Technology II. (4) II. Circuit analysis of power supplies, operational amplifiers, filters and oscillators including S-plane introduction, Fourier analysis, and transient response. Three hours rec. and three hours lab a week. Pr.: ET 533 and 537. Pr. or conc.: ENGL 415. ET-531-3-0925

ET 532. Instrumentation and Measurement Technology. (3) II. Principles and application of instrumentation and measurement equipment. Two hours rec. and three hours lab a week. Pr.: ET 431. ET-532-1-0925

ET 533. Electronic Devices and Systems. (4) I. Essential amplifier characteristics, elements, and analysis, including small signal and large signal units, device limitations, circuit configurations, and frequency response. Three hours rec. and three hours lab a week. Pr.: ET 431. ET-533-1-0925

ET 534. Automatic Control Technology. (3) I. Application-oriented control systems technology including basic systems dynamics, regulatory, servo, computer control, and system specifications. Two hours rec. and three hours lab a week. Pr.: ET 431. ET-534-1-0925

ET 536. Digital Logic Systems II. (4) I. Practical aspects of digital system design involving integrated and discrete circuit switching behavior, system interfacing, I/O devices, and A-D and D-A conversion, memory devices, and system debugging. Three hours lec. and one three-hour lab a week. Pr.: ET 436. ET-536-1-0925

ET 537. Electronic Measurements. (4) I. Operation and application of basic electronic measuring instruments including meters, oscilloscopes, potentiometers, bridges, spectrum analyzers, etc. Three hours rec. and three hours lab a week. Pr.: ET 431. ET-537-1-0925

ET 538. Peripherals and Interfacing. (4) II. Hardware fundamentals of digital peripherals, such as mass memory and display devices, including communication standards. The emphasis will be on interfacing. Three hours rec. and three hours lab a week. Pr.: ET 533, 536, and 537. ET-538-1-0925

ET 539. Electronic Communications. (4) I. Fundamental communication theory and circuitry including AM, FM, DSBSC, SSBSC, TDM, and pulse techniques. Generation, recovery, bandwidth, and applications are discussed. Three hours rec. and three hours lab a week. Pr. or conc.: ET 531. ET-539-1-0925

ET 540. Industrial Microprocessing. (3) I. Introduction to Boolean algebra and digital logic circuits. Elements of microcomputers; memory elements, central processing unit, tri-stating, memory maps, buses. Machine and assembly language programming. Principles of machine control and A/D and D/A interfacing. Two hours rec. and three hours lab a week. Pr.: ET 431 or equiv. For engineering technology majors and nonengineering majors only. ET-540-1-0925

ET 541. Electronic Design Laboratory. (2) I, II. Applications of the principles of the design process in executing design projects. Project will be developed by the instructor. Six hours of lab a week. Pr.: ET 430, 531, and 536. ET-541-1-0925

ET 542. Electric Motors and Controls. (4) II. Essential characteristics of shunt, series, synchronous, induction, and stepper motors. Application-oriented control systems including the basic dynamics of both time continuous and discrete variable types. Three hours rec. and three hours lab a week. Pr.: ET 531 and 536. ET-542-1-0925

ET 543. Optical Electronics. (3) I. Basic optical electronics including photometry, illumination, and radiance as they apply to electronic photoemitters, detectors, and light communication devices. Three hours rec. a week. Pr.: ET 533. ET-543-0-0925

ET 560. Kinematics and Mechanisms. (3) II. Plane motion analysis and elementary synthesis of fourbar linkages and cams, gears, and gear trains. Two hours rec. and three hours lab a week. Pr.: ET 511. ET-560-1-0925

ET 561. Machine Design. (3) I. Applications of statics, strength of materials, and kinematics to the design of machine components. Materials selection and fatigue loading are considered. Three hours rec. a week. Pr.: ET 560 and CE 331. ET-561-0-0925

ET 562. Mechanical Design Lab I. (2) I. Application of the principles of the design process in solving design projects. Projects will be obtained from industry or developed by instructor. Six hours lab a week. Pr.: ME 217. Pr. or conc.: ET 561. ET-562-1-0925

ET 563. Mechanical Design Lab II. (2) II. Continuation of Mechanical Design Lab I project with completion of detail design and drawings. Possibly building and testing components designed. Six hours lab a week. Pr.: ET 562. ET-563-1-0925

ET 569. Mechanical Equipment Laboratory. (2) I, II. Experiments using a variety of mechanical devices and systems to demonstrate fundamental concepts in mechanics, fluid mechanics, thermodynamics, and heat transfer. Six hours lab a week. Pr.: ET 512, 514, and 532. ET-569-1-0925

ET 583. Nuclear Reactor Technology II. (3) On sufficient demand. Theory of diffusion and slowing down of neutrons with application to subcritical and critical reactors; introduction to the time behavior of reactor systems. Three hours rec. a week. Pr.: ET 481. ET-583-0-0925

ET 584. Radiation Detection and Monitoring. (3) On sufficient demand. Principles of operation of detectors used in the measurement and monitoring of ionizing radiation. Three hours rec. a week. Pr.: ET 480. ET-584-0-0925

ET 585. Nuclear Reactor Thermal Technology. (3) On sufficient demand. Introduction to conduction, convection, and radiation heat transfer as applied to reactor cores and systems. Consideration of nuclear reactor safety and power reactor systems. Three hours rec. a week. Pr.: ET 481. ET-585-0-0925

ET 586. Radiation Protection Technology. (2) On sufficient demand. A study of radiation protection environmental effects of radiation and an introduction to nuclear reactor shielding. Two hours rec. a week. Pr.: ET 584. ET-586-0-0925

ET 640. Food Processing Operations. (5) II. A study of food processing unit operations and their applications with emphasis on heat and mass transfer operations such as drying, sterilization, freezing and thawing, extraction, and adsorption. Four hours rec. and three hours lab a week. Pr.: ET 440. ET-640-1-0925

Industrial Engineering

R. Michael Harnett,* Head

Professors D. Grosh,* Harnett,* Hwang,* Konz,* Lee,* and Tillman;* Associate Professors L. Grosh,* Willems, and Wilson; Assistant Professors Kramer and McCright;* Emeritus: Professor Hansen; Adjunct Professors Amos and Galitzer.*

Undergraduate study

The curriculum in industrial engineering emphasizes the design, improvement, and installation of integrated systems of people, materials, and equipment. Studies in mathematical, physical, and social sciences are united with a modern approach to principles of engineering analysis and design to specify, predict, and evaluate the results of any industrial system. In addition, strong consideration is given to the economic and human factors involved in industrial operations. With the advent of the inexpensive microprocessor, computer-aided manufacturing has become a major thrust in manufacturing. This area has provided a new frontier for industrial engineering, and there is currently a manufacturing option in the industrial engineering curriculum.

The use of newly developed techniques and fresh interpretations of more traditional approaches to industry's problems helps to keep the course and curriculum offerings current.

Graduate study

Major work is offered leading to the degrees master of science and doctor of philosophy with special emphasis on modern quantitative solution of industrial problems. Course work and research may be conducted in human factors, operations research, manufacturing engineering, and engineering management.

Ergonomics

Ergonomics (human factors) is the study of work. The basic sciences of physics, psychology, and physiology are applied in job design to fit the machine to the man rather than to fit the man to the machine. Subtopics include inspection, heat stress, cold stress, illumination, noise, toxicology, biomechanics, and workstation design.

Operations research

The study of operations research deals with building decision models, which may be mathematical, computer simulation, or statistical, with which a business concern or organization optimizes its decision making within a set of constraints. More recent work in multiple objective and multiple attribute decision making is stressed.

Manufacturing engineering

Manufacturing engineering treats the efficient use of machine tools and processes in the manufacture of discrete parts. Emphasis is on modern techniques such as CAD/CAM and computer control of machine tools as well as the use of the computer to collect and analyze data for control of the shop floor. The interface between the machine tool, a handling device such as a robot, and the part are essential parts of this program.

Engineering management

The program blends the basic engineering background with accounting, marketing, finance, operations research, and the behavioral sciences. This degree is of particular interest to engineers who do not have a B.S. in industrial engineering and want to broaden their backgrounds in management. Several strong supporting minors are available in the College of Engineering and College of Arts and Sciences.

Prerequisite to graduate work in these fields is the completion of an undergraduate curriculum in engineering or science that satisfies the major areas required in the undergraduate industrial engineering curriculum at Kansas State University.

Undergraduate students from other scientific disciplines such as mathematics, chemistry, physics, and computer science

are encouraged to consider the possibility of a graduate degree in industrial engineering.

Facilities and equipment for advanced study and research are extensive. Majors in the department have access to the University mainframe computing system through conveniently located remote-computing laboratories. In addition there are general purpose microcomputer laboratories in Durland Hall with PCs, workstations, and AI processors.

Industrial engineering (IE)

Bachelor of science in industrial engineering
133 hours required for graduation
Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology

Freshman

| | |
|---------------------------------------|---------------------------------------|
| Fall semester | |
| MATH 220 | Analytic Geometry and Calculus I .. 4 |
| CHM 210 | Chemistry I .. 4 |
| ECON 110 | Economics I .. 3 |
| ENGL 100 | English Composition I* .. 3 |
| Humanities or social science elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>17</u> |

Spring semester

| | |
|---------------------------------------|---|
| MATH 221 | Analytic Geometry and Calculus II .. 4 |
| CHM 230 | Chemistry II .. 4 |
| NE 385 | Engineering Computational Techniques .. 2 |
| ME 212 | Engineering Graphics I .. 2 |
| PE 101 | Principles of Physical Fitness .. 1 |
| Humanities or social science elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>16</u> |

Sophomore

| | |
|----------------------|---|
| Fall semester | |
| MATH 222 | Analytic Geometry and Calculus III .. 4 |
| PHYS 213 | Engineering Physics I .. 5 |
| ACCTG 211 | Financial Accounting .. 3 |
| IE 201 | Introduction to Industrial Engineering .. 3 |
| Literature elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>18</u> |

Spring semester

| | |
|---------------------|--|
| MATH 240 | Elementary Differential Equations .. 4 |
| PHYS 214 | Engineering Physics II .. 5 |
| IE 242 | Introduction to Manufacturing Engineering .. 3 |
| IE 373 | Computer Applications in Industrial Engineering .. 2 |
| Restricted elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>17</u> |

Junior

| | |
|----------------------|---|
| Fall semester | |
| STAT 510 | Introduction to Probability and Statistics I .. 3 |
| IE 530 | Industrial Project Evaluation .. 3 |
| IE 551 | Industrial Ergonomics .. 3 |
| EECE 519 | Electric Circuits and Controls .. 4 |
| ENGL 415 | Written Communication for Engineers* .. 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>16</u> |

Spring semester

| | |
|----------|--|
| STAT 511 | Introduction to Probability and Statistics II .. 3 |
| IE 541 | Statistical Quality Control .. 3 |
| IE 560 | Introduction to Operations Research I .. 3 |

| | |
|----------|-------------------------------|
| CE 530 | Statics and Dynamics .. 4 |
| SPCH 421 | Technical Speaking .. 3 |
| IE 050 | Industrial Plant Studies .. 0 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>16</u> |

Senior

| | |
|---------------------------------------|--|
| Fall semester | |
| IE 501 | Industrial Management .. 3 |
| IE 553 | Production Planning and Inventory Control .. 3 |
| IE design elective | 4 |
| IE elective | 3 |
| Humanities or social science elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>17</u> |

Spring semester

| | |
|---------------------------------------|--|
| IE 554 | Industrial Facilities Layout and Design .. 3 |
| CHE 352 | Engineering Materials I .. 3 |
| IE electives | 6 |
| Humanities or social science elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>16</u> |

*The prerequisite for ENGL 415 is satisfied with an A or B in ENGL 100. Otherwise the student must take ENGL 120, which, if necessary, may be taken for 3 hours of restricted elective.

Humanities and social science electives are to be selected from the catalog list, need not be taken at the time shown in the curriculum, and must include two courses at or above the 400 level.

Literature elective must be ENGL 310, 320, 340, 262, or 272.

Restricted elective must be selected from engineering, mathematics, computer science, economics, statistics, and business administration courses or ENGL 120, if necessary.

IE design elective must be either IE 573 or 580.

Industrial engineering elective is any course in industrial engineering below 800.

Manufacturing systems engineering option

The Department of Industrial Engineering has a baccalaureate option accredited as manufacturing systems engineering that should be of particular interest to those students preparing for a career in manufacturing.

Inherent in this program is the basic background of industrial engineering with an emphasis in manufacturing, particularly in computer-integrated manufacturing. Graduates of this program will have a strong background in the use of computers in integrating all phases of a manufacturing enterprise as well as the impact of other recent developments such as robots and lasers. The first two years are the same as the basic industrial engineering program.

133 hours required for graduation

Freshman

| | |
|---------------------------------------|---------------------------------------|
| Fall semester | |
| MATH 220 | Analytic Geometry and Calculus I .. 4 |
| CHM 210 | Chemistry I .. 4 |
| ECON 110 | Economics I .. 3 |
| ENGL 100 | English Composition I* .. 3 |
| Humanities or social science elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>17</u> |

Spring semester

| | |
|---------------------------------------|---|
| MATH 221 | Analytic Geometry and Calculus II .. 4 |
| CHM 230 | Chemistry II .. 4 |
| NE 385 | Engineering Computational Techniques .. 2 |
| ME 212 | Engineering Graphics I .. 2 |
| PE 101 | Principles of Physical Fitness .. 1 |
| Humanities or social science elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>16</u> |

Sophomore

| | |
|----------------------|---|
| Fall semester | |
| MATH 222 | Analytic Geometry and Calculus III .. 4 |
| PHYS 213 | Engineering Physics I .. 5 |
| ACCTG 211 | Financial Accounting .. 3 |
| IE 201 | Introduction to Industrial Engineering .. 3 |
| Literature elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>18</u> |

Spring Semester

| | |
|---------------------|--|
| MATH 240 | Elementary Differential Equations .. 4 |
| PHYS 214 | Engineering Physics II .. 5 |
| IE 242 | Introduction to Manufacturing Engineering .. 3 |
| IE 373 | Computer Applications in Industrial Engineering .. 2 |
| Restricted elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>17</u> |

Junior

| | |
|----------------------|---|
| Fall semester | |
| STAT 510 | Introduction to Probability and Statistics I .. 3 |
| IE 530 | Industrial Project Evaluation .. 3 |
| IE 551 | Industrial Ergonomics .. 3 |
| EECE 519 | Electric Circuits and Controls .. 4 |
| ENGL 415 | Written Communication for Engineers* .. 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>16</u> |

Spring semester

| | |
|----------|--|
| STAT 511 | Introduction to Probability and Statistics II .. 3 |
| IE 541 | Statistical Quality Control .. 3 |
| IE 552 | Production Process Engineering .. 3 |
| CE 530 | Statics and Dynamics .. 4 |
| SPCH 421 | Technical Speaking .. 3 |
| IE 050 | Industrial Plant Studies .. 0 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>16</u> |

Senior

| | |
|---------------------------------------|--|
| Fall semester | |
| IE 501 | Industrial Management .. 3 |
| IE 553 | Production Planning and Inventory Control .. 3 |
| IE 560 | Introduction to Operations Research I .. 3 |
| IE 580 | Manufacturing Systems Design and Analysis .. 4 |
| Humanities or social science elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>17</u> |

Spring semester

| | |
|---------------------------------------|--|
| IE 550 | Tool Engineering .. 3 |
| IE 554 | Industrial Facilities Layout and Design .. 3 |
| CE 533 | Mechanics of Materials .. 3 |
| CHE 352 | Engineering Materials I .. 3 |
| Humanities or social science elective | 3 |
| IE 015 | Engineering Assembly .. 0 |
| | <u>16</u> |

*The prerequisite for ENGL 415 is satisfied with an A or B in ENGL 100. Otherwise the student must take ENGL 120, which, if necessary, may be taken for 3 hours of restricted elective.

Humanities and social science electives are to be selected from the catalog list, need not be taken at the time shown in the curriculum, and must include two courses at or above the 400 level.

Literature elective must be ENGL 310, 320, 340, 262, or 272.

Restricted elective must be selected from engineering, mathematics, computer science, economics, statistics, and business administration courses or ENGL 120, if necessary.

Major electives approved list:

| | | |
|----------|---|---|
| STAT 511 | Introductory Probability and Statistics II | 3 |
| IE 605 | Advanced Industrial Management II | 3 |
| IE 550 | Tool Engineering | 3 |
| IE 552 | Production Process Engineering | 3 |
| IE 562 | Computer-Aided Manufacturing ... | 3 |
| IE 660 | Introduction to Operations Research II | 3 |
| IE 573 | Industrial Simulation | 4 |
| IE 580 | Manufacturing Systems Design and Analyses | 4 |
| IE 621 | Numerical Control of Machine Tools | 3 |
| IE 625 | Work Environments | 3 |
| IE 671 | Automated Factory Concepts | 3 |
| IE 672 | Robotic Applications | 3 |
| IE 685 | Principles of Manufacturing Information Systems | 3 |

Courses in industrial engineering

Undergraduate credit

IE 015. Engineering Assembly. (0) I, II. Assemblies are held once a month with presentations by practicing industrial engineers. Through this interaction students learn about various companies, their products, and operation. Required every semester. IE-015-0-0913

IE 050. Industrial Plant Studies. (0) II. Trip to industrial centers for study of facilities of special interest to industrial engineering students. Pr.: Junior standing in industrial engineering. IE-050-2-0913

IE 201. Introduction to Industrial Engineering. (3) I. Introduction to the major functions of industrial engineers with emphasis on the analysis, design, and control of production systems. Two hours lec. and three hours lab a week. Pr.: NE 385. IE-201-1-0913

IE 241. Production Processes. (3) I, II. A survey of basic manufacturing processes used in modern industry. Topics include measurement, metal machining, welding, casting, hot and cold press forming processes, heat treatment, powdered metals, plastics, and an introduction to automation. Hands-on experience in measurement, machining, welding, and casting. Two hours rec. and four hours lab a week. Not for industrial engineering majors. Pr.: ME 212. IE-241-1-0913

IE 242. Introduction to Manufacturing Engineering. (3) I, II. A survey of basic manufacturing processes, including: measurement, casting, metal machining, welding, hot and cold press forming processes, heat treatment, powdered metals and plastic molding; and including hands-on experience. An introduction to design of manufacturing processes. Two hours rec. and four hours lab a week. Pr.: ME 212. IE-242-1-0913

IE 372. Computers and Data Processing. (2) I, II, S. An introduction to computer programming using FORTRAN and computer solutions to engineering problems. Two hours rec. a week. IE-372-1-0913

IE 373. Computer Applications in Industrial Engineering. (2) II. Use of operating system, file storage in mainframe as well as microcomputers; applications software in engineering economy, mathematical programming, statistical analysis, and management reporting systems. One hour lec. and three hours lab a week. Pr.: NE 385 or a previous course in computers. IE-373-1-0913

IE 499. Honors Research in Industrial Engineering. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. IE-499-4-0913

Undergraduate and graduate credit in minor field

IE 501. Introduction to Industrial Management. (3) I, II. Basic functions in an industrial organization and their interrelationships; management considerations involving product, process, plant, and personnel. Three hours lec. a week. Pr. or conc.: ENGL 415. IE-501-0-0913

IE 530. Industrial Project Evaluation. (3) II. The evaluation of industrial project alternatives by the construction and analysis of mathematical models. Basic concepts, with an emphasis on constrained and unconstrained deterministic and probabilistic evaluation methodology, data analysis, and replacement theory. Three hours rec. a week. Pr.: MATH 222 and IE 373. IE-530-0-0913

IE 541. Statistical Quality Control. (3) II. Frequency distributions, normal, binomial, and Poisson distributions. Control charts on means, fraction defective, and number of defects. Dodge-Romig and Military Standard Sampling Plans. Three hours rec. a week. Pr.: STAT 510 or equiv. IE-541-0-0913

IE 550. Tool Engineering. (3) II. A survey of the function of tooling and the tool-making process as applied to production of goods. Topics range through the mechanics of material removal, machinability of materials, work holders, dies, fixtures, and tool material selection; the mechanics of the tool material involved and design problems. Two hours rec. and three hours lab a week. Pr.: IE 242. IE-550-1-0913

IE 551. Industrial Ergonomics. (3) I. Process analysis and charting; principles of motion economy and ergonomics; work stations and environments; biomechanics; micromotion analysis; and an introduction to standard data systems. Two hours rec. and three hours lab a week. Pr.: IE 242 or consent of instructor. IE-551-1-0913

IE 552. Production Process Engineering. (3) II. Advanced production techniques, an introduction to production machinery and controls, including numerical control processes. Two hours rec. and three hours lab a week. Pr.: NE 385 and EECE 519. IE-552-0-0913

IE 553. Production Planning and Inventory Control. (3) I. Principles, techniques, and applications of production planning and control and inventory control. Three hours rec. and two hours lab a week. Pr.: IE 373 and MATH 222. IE-553-0-0913

IE 554. Industrial Facilities Layout and Design. (3) II. Comprehensive design of an industrial production system; integration of the undergraduate industrial engineering courses. Two hours rec. and four hours lab a week. Pr.: IE 551. IE-554-1-0913

IE 560. Introduction to Operations Research I. (3) I, II. A study of the methods of operations research including model formulation and optimization. Topics include: assignment/transportation problems, linear programming, network flows, simulation. Three hours lec. a week. Pr.: IE 373 and MATH 222. Pr. or conc.: STAT 510. IE-560-0-0913

IE 562. Computer-Aided Manufacturing. (3) I. Concepts in CAM, integrated control of machine tools, and transport devices with production control. Concepts of CAM and automated assembly in a small lot production environment. Two hours lec. and three hours lab a week. Pr.: IE 242 and 552. IE-562-1-0913

IE 573. Industrial Simulation. (4) I. Computer simulation modeling of industrial systems emphasizing the design, verification, and validation of the models and the use of the model as a systems design tool. Three hours rec. and two hours lab a week. Pr.: IE 560. Conc.: STAT 511. IE-573-1-0913

IE 575. Quantitative Techniques in Industrial Engineering. (3) I, II. Problem formulation and conceptual models; application of finite mathematics and other techniques to problems of industrial engineering and management. Three hours rec. a week. Pr.: MATH 222. IE-575-0-0913

IE 580. Manufacturing Systems Design and Analysis. (4) I. Comprehensive design and analysis of a manufacturing system; integration of the undergraduate industrial engineering and manufacturing engineering option courses. Two hours rec. and four hours lab a week. Pr. or conc.: IE 551 and IE 553. IE-580-1-0913

Undergraduate and graduate credit

IE 601. Introduction to Systems Management. (3) I, II. Taught off campus at Fort Leavenworth only. A general introduction to the formulation and mathematical solution of management and business problems. Includes the formulation of business and management problems and their solutions, using optimization theory, finite mathematics, and statistical techniques. Three hours rec. a week. Pr.: MATH 222 and consent of instructor. IE-601-0-0913

IE 603. Topics in Industrial Engineering. (Var.) I, II, S. Case studies of industrial firms and recent developments in the fields of industrial engineering and management. Pr.: IE 501, 560, or consent of instructor. IE-603-0-0913

IE 605. Advanced Industrial Management. (3) II. Managing groups of employees in engineering settings; theory of organization design; design engineering and technological organizations; professionalism and ethical considerations in engineering. Three hours lec. a week. Pr.: IE 501. IE-605-0-0913

IE 610. Occupational Safety Engineering. (3) II. An overview of factors affecting safety in organizations, emphasizing analysis techniques and design strategies. Topics include occupational safety, accidents, fire protection, industrial hygiene, hazardous waste, toxicology, radiation safety, product liability, and federal standards. A project involving a hazard analysis and the design of solutions for a field location is required. Three hours lec. a week. Pr.: PHYS 214. IE-610-0-0913

IE 621. Numerical Control of Machine Tools. (3) I. Translation of information on engineering drawings through programming to tape preparation; application of computer programs to simplify control operations. Two hours rec. and three hours lab a week. Pr.: IE 242 and NE 385. IE-621-1-0913

IE 625. Work Environments. (3) II. Basic structure and performance of the human, viewed as a component in information processing and control systems. Effect of visual, auditory, toxic, and thermal environments. Two hours rec. and two hours lab a week. Pr.: Senior standing in engineering. IE-625-0-0913

IE 651. Standard Data Systems. (3) I. Taught off campus at Fort Leavenworth only. Microscopic and macroscopic standard data systems; commercial versions; company-developed plans; programmed standard data systems. Three hours rec. a week. Pr.: NE 385. IE-651-0-0913

IE 652. Ergonomics. (3) I, II. The design process, work analysis techniques, principles of work organization, work station, and hand tools. Facilities management. Lighting, noise, and industrial hygiene. Time determination. Work standards. Taught at Fort Leavenworth only. Three hours rec. a week. Pr.: MATH 222 and consent of instructor. IE-652-0-0913

IE 660. Introduction to Operations Research II. (3) II. Continuation of IE 560. Topics include decision theory, Markov processes, queueing theory, nonlinear programming, dynamic programming. Three hours lec. a week. Pr.: IE 560. IE-660-0-0913

IE 671. Topics In Automated Factory Concepts. (3) II. Introduction to concepts of automation, automatic transfer lines, and CAD/CAM. Emphasis on robots and their role in automated factories. Concepts of group technology, computer-aided process planning. Automated material-handling equipment for automated factories. Three hours lec. a week. Pr.: IE 553 and IE 573. IE-671-0-0913

IE 672. Robotic Applications. (3) II. History, development of the work environment for robots, their application and implementation. Concepts of control and sensory feedback in robots are covered. Three hours lec a week. Pr.: IE 242 and NE 385. IE-672-1-0913

IE 685. Principles of Manufacturing Information Systems. (3) I. Introduction to the theory and concepts of information for manufacturing. Design of manufacturing systems such as MRP, SFRS, CAD/CAM, etc. Concerns of integration and man-machine interface in manufacturing systems. Three hours lec. a week. Pr.: IE 242, IE 553. IE-685-0-0913

IE 751. Applied Decision Theory. (3) I, II. Bayes' theorem, Bayesian estimators, utility, loss function and risk, minimax strategies, elementary game theory. Three hours rec. a week. Pr.: STAT 511 or equiv. IE-751-0-0913

Graduate credit

IE 801. Problems In Industrial Engineering. (Var.) I, II, S. Pr.: Graduate standing. IE-801-3-0913

IE 805. Engineering Administration. (3) I. Engineering administration: organization; factors in decision making. Three hours rec. a week. Pr.: IE 501. IE-805-1-0913

IE 806. Engineering Project Management. (3) II. Planning, scheduling, and controlling engineering projects. Includes determination of appropriate project team, cost/benefit analysis, PERT and CPM scheduling techniques, reporting, and use of computerized project-management tools. Three hours lec. a week. Pr.: IE 501 and 530. IE-806-0-0913

IE 811. Advanced Production and Inventory Control. (3) I. Analytical and mathematical methods of making decisions on production, inventories, human resources, and shipping in modern industrial plants. Three hours rec. a week. Pr.: IE 553 or consent of instructor. IE-811-0-0913

IE 830. Applied Fuzzy Set Theory. (3) I. The emphasis will be on application. Topics covered are elementary fuzzy set theory, fuzzy measure, possibility theory, fuzzy linear programming and other fuzzy optimization techniques, fuzzy linguistics and expert systems, fuzzy production and inventory control, and fuzzy operations research models. Three hours rec. a week. Pr.: STAT 510. IE-830-0-0913

IE 842. Reliability Theory I. (3) I. The mathematics of reliability theory. The hazard function. Calculation of the failure density and mean life for series, parallel systems, and various types of standby systems. Hypotheses tests on mean life. Life testing with censoring. Three hours rec. a week. Pr.: STAT 511 or equiv. IE-842-0-0913

IE 843. Reliability Theory II. (3) II. Maintenance and repair models, availability, using Laplace transforms and Markovian analysis. Basics of Bayesian decision theory with applications to reliability theory. Three hours rec. a week. Pr.: IE 842. IE-843-0-0913

IE 850. Ergonomics (Human Factors) Engineering I. (3) I. The design and analysis of applied experimental research on human behavior as applied to engineering systems. An experimental project. Two hours rec, and three hours lab a week. Pr.: STAT 702 or 703. IE-850-0-0913

IE 865. Simulation of Industrial and Management Systems. (3) II. Simulating industrial management systems on computers using Monte Carlo techniques and simulation languages. Numerical methods related to simulation. Three hours rec. a week. Pr. or conc.: STAT 511 or consent of instructor. IE-865-0-0913

IE 872. Industrial Forecasting Techniques and Applications. (3) I. The problems of model construction for industrial forecasting. The application of least squares, regression, exponential smoothing, and adaptive fitting in solving industrial engineering problems. Three hours rec. a week. Pr.: STAT 511 or 705. IE-872-0-0913

IE 873. Industrial Systems Analysis. (Var.) II. Analysis and synthesis of automatic control systems with application to machines and processes and industrial management systems. A study of optimal control, stability, and sensibility of industrial management systems. Pr. or conc.: IE 660. IE-873-0-0913

IE 874. Operations Research I. (3) II, S. A study of the methods of operations research including formulation of models and derivation of solutions by various optimization techniques. Introduction to deterministic models and techniques, including optimization techniques, sequencing and replacement, linear programming, geometric programming, and dynamic programming. Three hours rec. a week. Pr. or conc.: IE 660. IE-874-0-0913

IE 881. Linear Programming. (3) II. Development of the theory of linear programming and related topics including simplex method, duality theory, integer programming, transportation methods, and stochastic linear programming. Application to industrial problems and the use of computer solutions are emphasized. Three hours rec. a week. Pr.: IE 560. IE-881-0-0913

IE 892. Graduate Seminar In Industrial Engineering. (1) I, II. Maximum total: 3 credit hours. Presentation and discussion of papers on industrial engineering subjects. One two-hour seminar a week. IE-892-0-0913

IE 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. IE-898-4-0913

IE 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. IE-899-4-0913

IE 950. Human Factors. (3) II. The design and analysis of experimental research on human behavior as applied to systems with emphasis on nonphysical tasks. An experimental project. Three hours rec. a week. Pr.: STAT 702 or 703. IE-950-0-0913

IE 971. Industrial Queueing Processes. (3) I, II. Introduction to the queueing process and theory of queues; analysis of single and multistation queues; application to production, materials handling, inventory, and maintenance systems. Three hours rec. a week. Pr.: STAT 510. IE-971-0-0913

IE 975. Operations Research II. (3) I. A continuation of IE 874. Introduction to stochastic models and techniques including queueing theory, simulation, nonlinear programming, calculus of variations, maximum principle, and forecasting. Three hours rec. a week. Pr.: IE 874 and STAT 770. IE-975-0-0913

IE 976. Scheduling Theory. (3) I, II. Project scheduling, assembly line balancing, shop scheduling, basic structure, measures of performance, combinatorial and statistical aspects. Various approaches to the analysis of shop scheduling. Three hours rec. a week. Pr.: Consent of instructor. IE-976-0-0913

IE 982. Nonlinear Programming. (3) I, II. Study of nonlinear models and their solution. Topics covered are nonlinear programming including Kuhn-Tucker theory, quadratic programming, separable programming, geometric programming, gradient and search methods, quasi-linearization, and invariant imbedding. Three hours rec. a week. Pr.: STAT 510. IE-982-0-0913

IE 983. Dynamic Programming. (3) I, II. A study of the optimization of multistage decision processes based on the application of the principle of optimality. Stochastic and deterministic models are developed. Three hours rec. a week. Pr.: STAT 510. IE-983-0-0913

IE 990. Advanced Topics In Operations Research. (Var., 6 maximum) I, II, S. Study of topics related to operations research not covered in other courses. Selected according to the interests and needs of graduate students. May be repeated. Pr.: Consent of instructor. IE-990-0-0913

IE 991. Multiple Criteria Decision Making. (3) I, II. Decision processes for problems involving multiple conflicting criteria; multiple attribute decision making; multiple objective decision making, and group decision making under multiple criteria. Various methods/approaches for different problems are discussed. Three hours rec. a week. Pr.: IE 560 and 874. IE-991-0-0913

IE 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. IE-999-0913

Mechanical Engineering

Allen C. Cogley,* Head

Professors Appl,* Azer,* Ball,* Cogley,* Gorton,* Gowdy,* Huang,* Jones,* Kipp,* Miller,* Thompson,* Turnquist,* and Walker;* Associate Professors Beck,* Eggeman,* Fenton,* and Swenson;* Assistant Professors Krishnaswami* and White;* Emeriti: Professors Brainard, Crank, Duncan, Lindholm, Messenheimer, Nesmith, Pauli, Rohles, and Wood.

Undergraduate study

Mechanical engineering is a broad profession that traditionally comprises three primary subfields: energy, mechanisms and machinery, and controls. The work done by mechanical engineers includes the design, construction, and use of systems for the conversion of energy available from natural sources (water, fossil fuels, nuclear fuels, solar radiation) to other forms of useful energy (for transportation, heat, light, power); design and production of machines to lighten the burden of servile human work and to do work otherwise beyond human capability; processing of materials into useful products; and creative planning, development, and operation of systems using energy, machines, and resources.

The curriculum includes engineering science courses in the sophomore and junior years and engineering application courses in the junior and senior years. Laboratory courses and humanistic and social science electives are found throughout the curriculum.

The entire curriculum serves as preparation for the senior design laboratory, where a team of three to five students is assigned to work on a realistic engineering problem supplied by an industrial sponsor. This brief internship gives the new mechanical engineering graduate the experience and confidence to move quickly into a productive and satisfying career.

Because of the broad and fundamental nature of the undergraduate curriculum, mechanical engineering provides an excellent background for careers in such fields as law, medicine, social services, urban design, and business management.

Individual programs

The electives in the curriculum provide the opportunity for students to develop skills of individual interest. Students with clear career objectives may be permitted to substitute appropriate courses for some of the required courses. For example, students interested in the aerospace industry can choose elective courses in propulsion, aerodynamics, aircraft stability and control, and composite materials. A special interest in automobiles may prompt students to choose elective courses in internal combustion engines, machine vibrations, composite materials, and thermodynamic analysis. The combinations are extensive.

Graduate study

Major work is offered leading to the master of science and doctor of philosophy degrees. Prerequisite to major graduate work in the field of mechanical engineering is the completion of a four-year curriculum substantially equivalent to that required of undergraduates in mechanical engineering at Kansas State University. In addition to major studies, a student, particularly at the doctorate level, is expected to develop strength in the physical sciences and mathematics by taking course work in those fields deemed appropriate by his or her supervisory committee.

Advanced work and research are offered in heat transfer, thermodynamics, air conditioning, energy conversion, automatic control, fluid and gas dynamics, environmental engineering, computer-aided engineering, engineering design, kinematics, and vibrations. Laboratory facilities and basic instrumentation are available for experimental work in these areas. Graduate students also have access to a variety of computers and the various engineering laboratories and shops.

Many research and teaching assistantships and fellowships are available to graduate students.

Curriculum in mechanical engineering (ME)

Bachelor of science in mechanical engineering
135 hours required for graduation
Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology

Freshman

| Fall semester | |
|---------------|--|
| CHM 210 | Chemistry I 4 |
| ENGL 100 | English Composition I* 3 |
| MATH 220 | Analytic Geometry and Calculus I . . . 4 |
| SPCH 105 | Public Speaking IA 2 |

| | |
|---|-----------|
| Humanities or social science elective | 3 |
| ME 015 Mechanical Engineering Seminar . . | 0 |
| | 16 |

Spring semester

| | |
|---|--|
| CHM 230 | Chemistry II 4 |
| Humanities or social science elective | 3 |
| MATH 221 | Analytic Geometry and Calculus II 4 |
| ME 212 | Engineering Graphics I 2 |
| ECON 110 | Economics I 3 |
| ME 015 | Mechanical Engineering Seminar . . 0 |
| | 16 |

Sophomore

Fall semester

| | |
|----------|---|
| MATH 222 | Analytic Geometry and Calculus III 4 |
| PHYS 213 | Engineering Physics I 5 |
| IE 241 | Production Processes 3 |
| NE 385 | Engineering Computational Techniques 2 |
| IE 372 | Computers and Data Processing . . . 2 |
| ME 217 | Engineering Graphics II 3 |
| ME 015 | Mechanical Engineering Seminar . . 0 |
| | 17 |

Spring semester

| | |
|----------|--|
| MATH 240 | Elementary Differential Equations 4 |
| PHYS 214 | Engineering Physics II 5 |
| CHE 352 | Engineering Materials I 3 |
| CE 333 | Statics 3 |
| ME 400 | Computer Applications in Mechanical Engineering 2 |
| ME 015 | Mechanical Engineering Seminar . . 0 |
| | 17 |

Junior

Fall semester

| | |
|----------|---|
| CE 533 | Mechanics of Materials 3 |
| EECE 519 | Electric Circuits and Control 4 |
| ME 512 | Dynamics 3 |
| ME 513 | Thermodynamics I 3 |
| ENGL 415 | Written Communication for Engineers* 3 |
| PE 101 | Principles of Physical Fitness 1 |
| ME 015 | Mechanical Engineering Seminar . . 0 |
| | 17 |

Spring semester

| | |
|---|--|
| EECE 589 | Circuits and Machines Lab 2 |
| ME 523 | Thermodynamics II 3 |
| ME 533 | Machine Design I 3 |
| ME 535 | Mechanical Engineering Lab I 3 |
| ME 571 | Fluid Mechanics 3 |
| Humanities or social science elective | 3 |
| ME 015 | Mechanical Engineering Seminar . . 0 |
| | 17 |

Senior

Fall semester

| | |
|---|---|
| ME 573 | Heat Transfer 3 |
| ME 583 | Mechanical Engineering Lab II 2 |
| ME 560 | Engineering Economics 3 |
| Technical electives | 6 |
| Humanities or social science elective | 3 |
| ME 015 | Mechanical Engineering Seminar . . 0 |
| | 17 |

Spring semester

| | |
|---|--|
| ME 563 | Machine Design II 3 |
| ME 575 | Mechanical Engineering Design Lab 3 |
| Technical electives | 9 |
| Humanities or social science elective | 3 |
| ME 015 | Mechanical Engineering Seminar . . 0 |
| | 18 |

*English Composition II is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum (two courses must be 400 level or above).

Of the 15 semester hours of technical electives shown above, one course must be chosen from approved course lists in each of the following areas: machine design/solid mechanics; thermal sciences; automatic controls. Electives must be selected to ensure that a minimum of 16 design and 15 humanities and social science credits are included in the program of study. All electives are to be chosen with the advice and approval of the faculty advisor and department head.

Courses in mechanical engineering Undergraduate credit

ME 015. Mechanical Engineering Seminar. (0) I, II. A monthly assembly of all undergraduates enrolled in the mechanical engineering curriculum for the purpose of exchanging information regarding academic, technical, social, ethical, and professional matters between students, faculty, and practicing professionals. One hour of lec. a month. ME-0-015-0919

ME 212. Engineering Graphics I. (2) I, II. Technical sketching, study of basic principles of projective geometry, multiview drawings, pictorials, reading and interpreting drawings, and creative or conceptual design on computers. Three hours lab and one hour rec. a week. Pr.: Plane geometry. ME-212-I-0910

ME 217. Engineering Graphics II. (3) I, II. Advanced study and application of projective geometry principles, functional design, detail and assembly layouts, design of charts and graphs, and conceptual design on computers. Five hours lab and one hour rec. a week. Pr.: ME 212. ME-217-I-0910

ME 220. Graphics A. (2) I. Technical sketching, pictorials, projection systems and the creation, reading and interpreting of multiview drawings, computer graphics. For non-engineering majors. Three hours lab and one hour rec. a week. Pr.: Plane Geometry. ME-220-0-0910

ME 390. Topics in Mechanical Engineering. (Var.) I, II, S. Topics selected in consultation with instructor. Intended for interdisciplinary studies or innovative studies in mechanical engineering. Pr.: Consent of instructor. ME-390-0-0910

ME 400. Computer Applications in Mechanical Engineering. (2) I, II. The development and application of computer techniques to the problems of design and analysis in mechanical engineering, including computer programming. Two hours rec. a week. Pr.: MATH 221 and NE 385. ME-400-0-0910

ME 499. Honors Research in Mechanical Engineering. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. ME-499-4-0910

Undergraduate and graduate credit in minor field

ME 512. Dynamics. (3) I, II, S. Vector treatment of kinematics, Newton's Laws, work and energy, impulse and momentum, with applications to problems of particle and rigid body motion. Three hours rec. a week. Pr.: CE 333 and MATH 222. ME-512-0-0910

ME 513. Thermodynamics I. (3) I, II, S. Properties of the pure substance. The first and second laws of thermodynamics. Three hours rec. a week. Pr.: PHYS 213; MATH 222. ME-513-0-0910

ME 523. Thermodynamics II. (3) I, II. Continuation of Thermodynamics I. Gas mixtures, psychrometry, generalized thermodynamic relations and reactive systems. Three hours rec. a week. Pr.: ME 513. ME-523-0-0910

ME 533. Machine Design I. (3) I, II. Displacement, velocity, and acceleration analysis of machine elements—cams, gears, and other mechanisms. A brief introduction to dynamics of machines. Three hours rec. a week. Pr.: ME 512. ME-533-0-0910

ME 535. Mechanical Engineering Laboratory I. (3) I, II. Theory and application of mechanical engineering measurements, instrumentation, and computer-based data acquisition. One hour rec. and six hours lab a week. Pr.: ME 400, 513, and EECE 519. ME-535-1-0910

ME 560. Engineering Economics. (3) I, II. Economic analysis of problems as applied in engineering. Three hours rec. a week. Pr.: ECON 110, junior standing in engineering. ME-560-0-0910

ME 563. Machine Design II. (3) I, II. Design and analysis of machine elements, such as shafting, springs, screws, belts, brakes, clutches, gears, and bearings, with emphasis on strength, rigidity, and wear qualities. Three hours rec. a week. Pr.: CE 533 and ME 533. ME-563-0-0910

ME 571. Fluid Mechanics. (3) I, II, S. Physical properties; fluid statics; dynamics of ideal and real fluids (for incompressible and compressible flow); impulse and momentum; laws of similitude; dimensional analysis; flow in pipes; flow in open channels; flow about immersed objects. Three hours rec. a week. Pr.: ME 512. Pr. or conc.: ME 513. ME-571-0-0910

ME 573. Heat Transfer. (3) I, II. Fundamentals of conduction, convection, and radiation; principles of heat exchanger design and dimensional analysis. Three hours rec. a week. Pr.: ME 571, MATH 240. ME-573-0-0910

ME 575. Mechanical Engineering Design Laboratory. (3) I, II. Application of the principles of the design process in the solution of engineering industrial-type problems with direct involvement of industry. Six hours lab a week. Pr. or conc.: ME 573 and 563. ME-575-1-0910

ME 583. Mechanical Engineering Laboratory II. (2) I, II. Planning and executing experimental studies on mechanical and thermal systems; analysis of experimental results; oral and written reports. Six hours lab a week. Pr.: ME 535 and 571. Pr. or conc.: ME 573. ME-583-1-0910

Undergraduate and graduate credit

ME 620. Internal Combustion Engines. (3) I. Analysis of cycles, design, and performance characteristics. Three hours rec. a week. Pr.: ME 523. ME-620-0-0910

ME 622. Environmental Engineering I. (3) II. Psychrometry; heating-cooling system design; refrigeration basics. Three hours rec. a week. Pr. or conc.: ME 573. ME-622-0-0910

ME 628. Aerodynamics. (3) I. A general introduction to aerodynamics including the analysis of lift, drag, thrust, and aircraft performance for subsonic aircraft. Three hours rec. a week. Pr.: ME 571 and MATH 240. ME-628-1-0910

ME 631. Aircraft and Missile Propulsion. (3) II. Mechanics and thermodynamics of aircraft and missile propulsion systems; combustion; air-breathing jet engines; rockets; applied compressible flow; propellants; performance and design of propulsion systems. Three hours rec. a week. Pr.: ME 523, 571, and MATH 240. ME-631-0-0910

ME 633. Thermodynamics of Modern Power Cycles. (3) I. The first and second law analysis of modern steam cycles for both fossil-fuel and nuclear-fuel installations. Cycle efficiency and factors affecting performance, such as cycle design, load factor, and auxiliaries. Thermal pollution resulting from steam cycles. Three hours rec. a week. Pr.: ME 513. ME-633-0-0913

ME 635. Dynamics of Flight—Stability and Control. (3) II. Stability and control of aircraft and missiles. Development of the general equations of unsteady motion for six-degree-of-freedom machines. Stability derivatives solution and analysis of the linearized problem. Longitudinal and lateral normal modes. Pr.: ME 512. Pr. or conc.: ME 628 or consent of instructor. ME-635-0-0910

ME 640. Automatic Controls. (3) I. Analysis of the dynamic behavior of mechanical, thermal, fluid, and electrical elements using basic physical laws. Transient and frequency response characteristics, stability and sensitivity analysis. Design of automatic control systems. Three hours rec. a week. Pr.: ME 535, ME-640-0-0910

ME 645. Fluid Control Systems. (3) II. Study of hydraulic, pneumatic, and fluidic control systems and their application in industry. Analysis and modeling of system components including pumps, valves, and actuators. Design techniques for both feedback and nonfeedback systems. Laboratory demonstrations. Three hours rec. a week. Pr.: ME 535. ME-645-1-0910

ME 650. Introduction to Computer-Aided Design. (3) I. Scope of computer-aided design, computer-aided design workstations, interactive programming, numerical methods and computer graphics in computer-aided design, applications to design problems, introduction to finite elements, and optimal design. Pr.: ME 400 and senior standing in engineering. ME-650-0-0910

ME 651. Introduction to Composites. (3) II. The analysis and behavior of a laminate. Design, fabrication, and testing of elements made of various composite materials. Two hours rec. and three hours lab a week. Pr.: CE 533 and senior standing in engineering. ME-651-0-0910

ME 656. Machine Vibrations I. (3) I, II. A general consideration of free and forced vibration in machines for various degrees of freedom; critical speed; vibration isolation. Three hours rec. a week. Pr.: ME 512 and MATH 240. ME-656-0-0910

ME 699. Problems in Mechanical Engineering. (Var.) I, II, S. Pr.: Approval of department head. ME-699-3-0910

ME 716. Intermediate Dynamics. (3) II, in even years. General vector principles of the dynamics of particles and rigid bodies; applications to orbital calculations, gyroynamics, and rocket performance; introduction to the energy methods of advanced dynamics. Three hours rec. a week. Pr.: ME 512 and MATH 240. ME-716-0-0910

ME 720. Intermediate Fluid Mechanics. (3) I. A continuation of ME 571 in the study of general topics in fluid mechanics including viscous flow, compressible flow, turbulence, and boundary layer theory. Numerous applications utilizing computational fluid dynamics. Three hours rec. a week. Pr.: ME 571, MATH 240. ME-720-0-0910

ME 721. Thermal Systems Design. (3) II, in odd years. Thermal systems design including economics, simulation, and optimization. Includes heating, ventilating, and air conditioning (HVAC) design and control. Pr.: ME 573. ME-721-0-0910

ME 722. Environmental Engineering II. (3) I, in even years. Characteristics of air conditioning compressors, condensers, evaporators; system characteristics; air conditioning system controls; refrigeration systems; acoustics. Three hours rec. a week. Pr.: ME 622. ME-722-0-0910

ME 730. Control Systems Analysis and Design. (3) II. Use of classical analysis techniques for control system compensation. State space-control theory fundamentals are presented in addition to an introductory treatment of several major systems areas. Pr.: EECE 530 or ME 712. Same as EECE 730. ME-730-0-0910

ME 732. Robotic System Analysis. (3) I, in even years. Modeling and static position and dynamic motion of a serial link manipulator. Forward and inverse kinematics, differential motion, path description and generation, dynamic and static forces, dynamic formulations, and feedback control of joint actuators. Project work includes robot computer software development and lab exercises. Pr.: ME 512. Pr. or conc.: ME 640. ME-732-0-0910

ME 735. Geometric Modeling. (3) II, in even years. Geometric aspects of computer graphics. Two- and three-dimensional homogeneous transformations; hidden line and surface removal; space curves and surfaces, including Bezier and B-spline methods; solid modeling; applications and current topics. Same as CIS 735. Pr.: ME 650 or CIS 636 or EECE 636. ME-735-0-0910

ME 736. Applied Elasticity. (3) I. Analysis of stress and strain at a point in an elastic medium; two-dimensional problems in rectangular and polar coordinates; torsion of bars; energy principles; numerical methods. Three hours rec. a week. Pr.: CE 533. ME-736-0-0910

ME 738. Experimental Stress Analysis. (3) II, in odd years. Experimental methods of investigating stress distributions. Photoelastic models, photoelastic coatings, brittle coatings, and resistance strain gauges applied to static and dynamic problems. Two hours rec. and three hours lab a week. Pr. or conc.: CE 533. ME-738-1-0910

ME 756. Machine Vibrations II. (3) I, in even years. Advanced consideration of systems having free and forced vibrations, with particular reference to several degrees of freedom, distributed mass, generalized coordinates, and non-linear forms. Three hours rec. a week. Pr.: ME 656. ME-756-0-0910

ME 757. Kinematics. (3) I, in odd years. Geometry of constrained motion applied to joint paths, specific input-output relations, function generators, kinematic synthesis. Three hours rec. a week. Pr.: ME 533. ME-757-0-0910

ME 760. Engineering Analysis I. (3) I. Methods of analysis employed in the solution of problems selected from various branches of engineering. Emphasis is on discrete systems. Three hours rec. a week. Pr.: MATH 240 and senior standing. ME-760-0-0920

ME 762. Finite Elements. (3) II. The modeling of lumped parameter systems. Element formulation, assembly, and solution are covered in detail. Standard element families, solution methods, energy techniques, display of results using computer graphics, and applications in heat transfer, fluid, and structural mechanics. The student will develop a complete finite element program. Pr.: ME 400. Pr. or conc.: ME 573 or graduate standing. ME-762-0-0910

ME 773. Intermediate Heat Transfer. (3) II. Conduction, convection, and radiation, mass transfer, phase change, heat exchangers, introductory numerical methods. Three hours rec. a week. Pr.: ME 573. ME-773-0-0910

ME 775. Optimal Mechanical Design. (3) II, in odd years. The philosophy of optimal design; unconstrained minimization for single variable and multivariable cases; linear and quadratic programming; constrained nonlinear optimization; applications to design of structures, mechanisms, dynamic systems, components, control systems, etc. Pr.: ME 400, MATH 240, and senior standing in engineering. ME-775-0-0910

Graduate credit

ME 811. Thermodynamic Analysis. (3) II. Basic considerations of the three laws of equilibrium thermodynamics. Availability analysis with applications including multicomponent systems. Three hours rec. a week. Pr. ME 523, 571, and MATH 240. ME-811-0-0910

ME 815. Gas Dynamics. (3) II. Compressible fluid mechanics including subsonic and supersonic flow, steady and unsteady motions, and shock wave phenomena. Numerical computations and analytical methods for external and internal flow fields. Applications are emphasized. Pr.: MATH 240, ME 523, 571, and 720. ME-815-0-0910

ME 818. Introduction to the Theory of Continuous Media. (3) II, in odd years. Analysis of strain, motion, and stress; fundamental laws; constitutive equations; applications to fluid, elastic, and plastic media. Three hours rec. a week. Pr.: ME 512, MATH 240, and ME 736 or 773. ME-818-0-0910

ME 831. Boundary Layer Theory. (3) II, in even years. The development and solution of various laminar boundary layer problems involving momentum, heat, and mass transfer for a compressible viscous fluid. Three hours rec. a week. Pr.: ME 573. ME-831-0-0910

ME 836. Introduction to Fracture Mechanics. (3) II, in even years. Introduces fracture mechanics concepts and applications. Topics include the asymptotic solution for stress at a crack tip, energy balance and crack propagation, computing stress intensity factors, fatigue crack growth, fracture of concrete, applications, and current topics. Three hours rec. a week. Pr.: ME 736 or CE 730. ME-836-0-0910

ME 846. Random Vibration. (3) I, in odd years. Theory of random processes and application to random vibration of mechanical systems. Three hours rec. a week. Pr.: ME 656. ME-846-0-0910

ME 860. Engineering Analysis II. (3) II. Continuation of Engineering Analysis I. Emphasis placed on continuous systems. Three hours rec. a week. Pr.: ME 760 or consent of instructor. ME-860-0-0910

ME 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. ME-898-4-0910

ME 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. ME-899-4-0910

ME 913. Thermodynamics and Transport Properties. (3) I, in odd years. Comprehensive study of the laws of thermodynamics. Use of kinetic theory and statistical thermodynamics for prediction of thermodynamic properties, thermodynamic equilibrium, transport properties, irreversible processes fluctuations. Three hours rec. a week. Pr.: ME 811. ME-913-0-0910

ME 920. Advanced Topics in Thermal and Fluid Mechanics. (Var.) On sufficient demand. Topics may include combustion, direct energy conversion, modeling, and design of internal combustion engines, non-equilibrium multiphase and multicomponent systems, refrigeration, cryogenics, stability, and turbulence. Pr.: ME 720 or 773 or 913. ME-920-0-0910

ME 921. Thermal Systems Analysis. (3) II, in odd years. Advanced study of steady-state and dynamic simulation of thermal systems; thermal systems optimization. Thermodynamic availability and probabilistics in thermal system design. Three hours rec. a week. Pr.: ME 721. ME-921-0-0910

ME 935. Heat Conduction in Solids. (3) I. General differential equation of heat conduction and methods of solution for two-dimensional steady-state transient heat flow, periodic heat flow, and internal heat sources. Three hours rec. a week. Pr.: ME 573. ME-935-0-0910

ME 940. Advanced Topics in Solid Mechanics and Machine Design. (Var.) On sufficient demand. Topics may include advanced elasticity, plasticity, tribology, probabilistic machine design, robotics, advanced and computational dynamics, and nonlinear mechanics. Pr.: ME 736 or 716 or 846. ME-940-0-0910

ME 942. Convection Heat Transfer. (3) II, in odd years. Energy and momentum equations in convective heat transfer, laminar and turbulent thermal boundary layers, steady and nonsteady convection problems. Three hours rec. a week. Pr.: ME 573. ME-942-0-0910

ME 943. Radiation Heat Transfer. (3) I, in even years. Basic theories of thermal radiation, shape factors; exact and approximate solutions of integral equations for radiation heat transfer between solid surfaces with absorbing or nonabsorbing medium. Three hours rec. a week. Pr.: ME 573. ME-943-0-0910

ME 947. Boiling Heat Transfer. (3) I, in alternate years. Principles of boiling heat transfer and thermal hydraulics of two-phase flow; computational methods; design and analysis applications. Three hours rec. a week. Pr.: NE 847 or ME 942. Same as NE 947. ME-947-0-0910

ME 999. Dissertation Research in Mechanical Engineering. Ph.D. level. (Var.) I, II, S. Pr.: Approval of department head and major professor. ME-999-4-0910

Nuclear Engineering

N. Dean Eckhoff,* Head

Professors Donnert,* Eckhoff,* Faw,* Merklin,* Shultis,* and Simons;* Assistant Professors Hightower and Wang.*

Undergraduate study

The curriculum leading to the B.S. in nuclear engineering prepares students for professional positions in industry, government, and private practice. Through technical electives, the student may organize a program suited to particular needs and interests. The student may elect a program leading to specialized engineering practice or to postgraduate study in engineering, science, medicine, or law.

Graduate study

Major work is offered leading to the degrees master of science in nuclear engineering and doctor of philosophy in engineering.

Applicants for graduate status are expected to hold the bachelor's degree with adequate preparation in mathematics and physical sciences. Programs of study will be arranged with a proper balance of subject matter from other fields to meet the needs of individual students.

Laboratory facilities

Facilities include 250-kilowatt TRIGA Mark II reactor with pulsing capability to 250,000 kilowatts. Co-60 sources; neutron activation analysis laboratory with multi-channel analyzers, gamma-ray spectrometers, high-speed printers, plotters, and magnetic tape recorders; nuclear instrumentation laboratory with lab stations containing digital logic systems, instrumentation modules for pulse analysis and systems timing, dual-beam oscilloscopes, pulse and wave form generators; radioisotope application laboratory with instructional equipment for radiation detection and analysis; and thermoluminescent dosimeter systems; a radiation standards laboratory; shock-tube laboratory with instrumentation for studies of combustion kinetics, molecular rate processes, and transient thermal and hydraulic phenomena; combustion laboratory with a flat flame diagnostic system; an analytical laboratory with gas chromatographs, atomic absorption spectrometers, a Cary-14 spectrophotometer, a DU-spectrophotometer, a spinning band distillation column, a mass spectrometer, and a zone refiner; applied optics laboratory with high-power argon ion laser and associated apparatus used in Doppler velocimetry, Raman scattering, and holographic interferometry studies of heat, mass, and momentum transport phenomena. Other: graphite diffusion assembly, gamma irradiator, digital microcomputers, and analog computers.

Curriculum in nuclear engineering (NE)

Bachelor of science in nuclear engineering
132 hours required for graduation
Accredited by the Engineering Accreditation
Commission of the Accreditation Board for Engineering and Technology

Freshman

| Fall semester | |
|---------------|--|
| NE 110 | Nuclear Engineering Concepts 2 |
| ENGL 100 | English Composition I 3 |
| CHM 210 | Chemistry I 4 |
| MATH 220 | Analytic Geometry and Calculus I . . . 4 |
| PE 101 | Principles of Physical Fitness 1 |
| ECON 110 | Economics I 3 |
| | 17 |

Spring semester

| | |
|---------------------------------------|--|
| NE 385 | Engineering Computational Techniques 2 |
| CHM 230 | Chemistry II 4 |
| MATH 221 | Analytic Geometry and Calculus II 4 |
| SPCH 105 | Public Speaking IA 2 |
| Humanities or social science elective | 3 |
| | 15 |

Sophomore

| Fall semester | |
|---------------------------------------|--|
| CHE 350 | Engineering Materials 2 |
| PHYS 213 | Engineering Physics I 5 |
| MATH 222 | Analytic Geometry and Calculus III 4 |
| NE 415 | Introduction to Engineering Analysis 3 |
| Humanities or social science elective | 3 |
| | 17 |

Spring semester

| | |
|---------------------------------------|--|
| PHYS 214 | Engineering Physics II 5 |
| NE 500 | Applied Engineering Analysis 3 |
| CE 530 | Statics and Dynamics 4 |
| Humanities or social science elective | 5 |
| | 17 |

Junior

| Fall semester | |
|--------------------|---|
| NE 515 | Nuclear Engineering Materials 3 |
| EECE 519 | Electric Circuits and Control 4 |
| ME 513 | Thermodynamics I 3 |
| NE 505 | Elements of Nuclear Engineering . . . 3 |
| Technical elective | 3 |
| | 16 |

Spring semester

| | |
|---------------------------------------|---|
| NE 512 | Principles of Radiation Detection . . . 3 |
| NE 520 | Neutron and Particle Interactions I 2 |
| ME 571 | Fluid Mechanics 3 |
| NE 602 | Radiation Protection Engineering I 3 |
| Technical elective | 3 |
| Humanities or social science elective | 2 |
| | 16 |

Senior

| Fall semester | |
|---------------------|--|
| ENGL 415 | Written Communication for Engineers* 3 |
| NE 630 | Applied Reactor Theory 3 |
| NE 647 | Thermal Hydraulics Laboratory 1 |
| NE 693 | Radiation Shielding Design 3 |
| ME 573 | Heat Transfer 3 |
| Technical electives | 4 |
| | 17 |

*English Composition II is optional if prerequisites for Written Communication for Engineers (ENGL 415) are met from English Composition I. If necessary, English Composition II may be substituted for 3 hours of technical electives.

Humanities and social science electives are to be selected from the approved list and need not be taken in the order listed in the curriculum (two courses must be 400 level or above).

A technical elective program of study is chosen in consultation with the student's advisor and presented for approval to the department faculty.

Courses in nuclear engineering

Undergraduate credit

NE 110. Nuclear Engineering Concepts. (2) I. A survey of nuclear engineering that acquaints students with the technical and professional activities and responsibilities of nuclear engineers. Two hours lec. a week. NE-110-0-0920

NE 385. Engineering Computational Techniques. (2) I, II. Application of digital computer methods to the solution of engineering problems. Two hours lec. a week. Pr.: MATH 220. NE-385-0-0920

NE 415. Introduction to Engineering Analysis. (3) I. Introduction to analytical, statistical, and numerical analysis, including computer programming, as applied to engineering. Three hours rec. a week. Pr.: MATH 211 or 221. NE-415-0-0920

NE 499. Honors Research in Nuclear Engineering. (Var.) I, II. Individual research problem selected with approval of faculty advisor. Open to students in the College of Engineering honors program. A report is presented orally and in writing during the last semester. NE-499-4-0920

Undergraduate and graduate credit in minor field

NE 500. Applied Engineering Analysis. (3) II. Methods and applications of analytical, statistical, and numerical analysis in engineering, including computer programming. Three hours rec. a week. Pr.: NE 415. NE-500-0-0920

NE 501. Introduction to Nuclear Engineering. (3) I, II, S. An overview course to acquaint non-nuclear engineers with introductory aspects of nuclear engineering. Three hours rec. a week. Pr.: Junior standing in engineering or physical sciences. NE-501-0-0920

NE 505. Elements of Nuclear Engineering. (3) I. Introduction to radioactive decay, neutron reactions and interactions, radiation interaction with matter, and reactor physics. Three hours lec. a week. Pr.: MATH 221 and PHYS 213. NE-505-0-0920

NE 512. Principles of Radiation Detection. (3) II. Operating principles and general properties of devices used in the detection and characterization of ionizing radiation. Two hours rec. and three hours lab a week. Pr.: NE 505. NE-512-1-0920

NE 515. Nuclear Engineering Materials. (3) I. An investigation of the nuclear properties, metallurgy, the processing of nuclear materials, and the behavior of fuels and components in a radiation environment. Three hours lec. a week. Pr.: NE 505 and CHE 352. NE-515-0-0920

NE 520. Neutron and Particle Interactions I. (2) II. Neutron interactions and associated cross sections of importance to nuclear reactor theory; fission and its application to reactor design; energetics of multiple neutron scattering and neutron thermalization. Two hours rec. a week. Pr.: NE 505. NE-520-0-0920

Undergraduate and graduate credit

NE 602. Radiation Protection Engineering I. (3) II. Basic principles and concepts of radiation protection. Analysis of radioactive-decay systematics, dose and risk concepts, description of natural and other sources of ionizing radiation, basic procedures of external and internal dose evaluation, waste storage and disposal. Three hours lec. a week. Pr.: NE 500 and 505. Pr. or conc.: NE 512. NE-602-0-0920

NE 620. Problems in Nuclear Engineering. (Var.) I, II, S. Specific studies in current and advanced problems in various phases of nuclear engineering. Pr.: Consult head of department. NE-620-3-0920

NE 630. Applied Reactor Theory. (3) I. Theory of diffusion and slowing down of neutrons with application to critical and subcritical nuclear reactors. Measurement of various reactor physics parameters. Three hours rec. a week. Pr.: NE 520. NE-630-0-0920

NE 635. Plasma Physics. (3) I. Fundamental properties of plasmas; motion of ions and electrons in electromagnetic fields; plasmas as magneto-hydrodynamic fluids; plasma waves; diffusion phenomena in plasmas; electric resistivity of plasmas; equilibrium and plasma stability; kinetic theory of plasmas. Three hours rec. a week. Same as PHYS 635. Pr.: PHYS 532 or EECE 557, and PHYS 621. NE-635-0-0920

NE 647. Thermal Hydraulics Laboratory. (1) I. A laboratory introduction to the fluid mechanics and heat transfer mechanisms in reactor cooling. Three hours lab a week. Pr. or conc.: ME 571. NE-647-1-0920

NE 648. Reactor Operations Laboratory. (2) II. Licensing, nuclear safety, and reactor operations. Measurement of nuclear reactor parameters. One hour lec. and three hours lab a week. Pr.: NE 512 and 630. NE-648-1-0920

NE 675. Neutron and Particle Interactions II. (2) II. Engineering approach to the quantum mechanics of the interaction of neutrons and other nuclear radiations with matter; theoretical methods for the evaluation of nuclear reaction cross sections required for engineering applications. Two hours rec. a week. Pr.: NE 500 and 520. NE-675-0-0920

NE 693. Radiation Shielding Design. (3) I. Sources of radiation, kernel concepts, and application of diffusion and ray theory to shielding calculations and design, with applications principally in stationary nuclear reactor shielding. Three hours rec. a week. Pr.: NE 602. Pr. or conc.: NE 630. NE-693-0-0920

NE 694. Nuclear Reactor Thermal Design. (3) II. Application of thermal-hydraulic principles to the design and analysis of nuclear power plants, with special emphasis on safety systems. Three hours rec. a week. Pr.: NE 630 and ME 573. NE-694-0-0920

NE 696. Nuclear Systems Design. (3) II. Application of the principles of nuclear reactor kinetics and simulation, linear stability of reactor systems, and noise analysis to nuclear reactor systems. Three hours rec. a week. Pr.: NE 630. NE-696-0-0920

NE 697. Nuclear Engineering Design. (2) II. Individually prepared report on the solution of a design problem. Regulations and economics of nuclear power facilities. Two hours rec. a week. Pr.: NE 630. NE-697-0-0920

NE 750. Direct Energy Conversion. (3) II. Principles and analysis of direct conversion phenomena, with special emphasis on direct conversion of nuclear energy including thermoelectric, thermoionic, photovoltaic, magneto-hydrodynamic, and electrochemical processes. Three hours rec. a week. Pr.: NE 647. NE-750-0-0920

NE 761. Radiation Measurement Systems. (4) I. Principles of systems used to measure radiation. Applications to radiation monitoring, dosimetry, and spectroscopy. Three hours rec. and three hours lab a week. Pr.: NE 512. NE-761-0-0920

NE 762. Nuclear Instrumentation. (4) II. Design and analysis of nuclear instrumentation. Application to nuclear reactor control, radiation dosimetry, and nuclear spectroscopy. Three hours rec. and three hours lab a week. Pr.: EE 510 or 519, and NE 512. NE-762-1-0920

NE 772. Radiation Effects on Materials I. (3) I. General theory of radiation damage to solids. Specific effects of radiation on nuclear reactor components and materials of construction. Applications to nuclear reactor design. Three hours rec. a week. Pr.: NE 520. NE-772-0-0920

NE 774. Radiation Effects on Materials II. (3) II. General theory of radiation effects on liquids and gases. Principles of radiation chemistry, photochemistry, and biophysics. Medical, agricultural, and industrial applications. Three hours rec. a week. Pr.: NE 520 or CHM 595. NE-774-0-0920

NE 799. Special Topics in Nuclear Engineering. (Var.) On sufficient demand. Topical material of importance in nuclear engineering, such as controlled thermonuclear reactions, numerical analysis, Monte Carlo methods in radiation transport, effects of nuclear explosions, etc. Pr.: Consent of head of department. NE-799-3-0920

Graduate credit

NE 806. Neutronics. (3) I. Particle transport, theories of diffusion, numerical analysis of diffusion, transient core analysis. Three hours rec. a week. Pr.: NE 630. NE-806-0-0920

NE 810. Graduate Problems in Nuclear Engineering. (Var.) I, II, S. Specific studies in advanced problems in various phases of nuclear engineering. Pr.: Graduate standing and consent of head of department. NE-810-4-0920

NE 847. Nuclear Power Engineering. (3) II. Advanced techniques in thermal-hydraulic analysis as applied to nuclear power reactors, including computational methods used for conduction and convection heat transfer. Three hours rec. a week. Pr.: ME 573 or equiv. NE-847-0-0920

NE 851. Nuclear Engineering Laboratory. (2) I, S. On demand. Design of experiments for the TRIGA nuclear reactor. Six hours lab a week. Pr.: NE 630 and 648. NE-851-1-0920

NE 860. Advanced Topics in Nuclear Engineering. (Var.) I, II, S. A presentation of various special topics covering advanced nuclear engineering specialties. Pr.: Graduate standing and consent of head of department. NE-860-0-0920

NE 890. Nuclear Engineering Colloquium. (1) I, II. Presentation and discussion of progress reports on research, special problems, and outstanding publications in nuclear engineering and related fields. Pr.: Graduate standing in nuclear engineering. NE-890-0-0920

NE 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. NE-899-4-0920

NE 947. Boiling Heat Transfer. (3) I. Alternate years. Principles of boiling heat transfer and thermal hydraulics of two-phase flow; computational methods; design and analysis applications. Three hours rec. a week. Pr.: NE 847 or ME 942 or equiv. Same as ME 947. NE-947-0-0920

NE 998. Selected Advanced Topics in Nuclear Engineering. (Var.) II, on sufficient demand. Current topics of interest in nuclear engineering at an advanced level, such as controlled thermonuclear reactions, numerical analysis, Monte Carlo methods in radiation transport, etc. Pr.: Consent of department head. NE-998-3-0920

NE 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. NE-999-4-0920

Human Ecology

Barbara S. Stowe, Dean

Virginia M. Moxley, Associate Dean for Academic Affairs

Jean Sego, Assistant to the Dean for Academic Programs and Records

Karen Pence, Assistant to the Dean for Advising

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119 Justin Hall

532-5500

The College of Human Ecology provides the context for the study of people, their near environments, and especially the interaction between the two. Emphasis is placed on the design and management of environments and services which enhance human productivity and well-being.

Professional objectives are met through programs in four departments: Clothing, Textiles, and Interior Design; Foods and Nutrition; Hotel, Restaurant, Institution Management and Dietetics; and Human Development and Family Studies. Students may also enroll in general human ecology programs which prepare them for careers in cooperative extension, home economics education, or mass communications.

The bachelor of science degree is offered in each area of specialization and in general human ecology. The master of science degree is offered by each department. Two doctoral programs lead to the Ph.D.

The College of Human Ecology offers activities and experiences which enhance professional study. These include field study (see department descriptions, below), participation in professional organizations and activities, and career placement.

All programs of study are accredited by professional agencies.

Degree programs

All undergraduate programs of study lead to a bachelor of science degree. The programs are listed on the chart and described on the following pages.

Entering students who are undecided about a specific major may enroll in general human ecology. The program provides an opportunity for students to consider the many alternatives available before they choose a college major. Students who enroll in general human ecology will work with special advisors to select courses that will enable them ultimately to enter the degree program of their choice.

General Requirements

Bachelor of science degree

Each degree offered by the College of Human Ecology includes a minimum of 37 hours in general education; professional and supporting courses in a specific option, including a minimum of 33 hours from departments within the college; and unrestricted electives as needed to total 125-131 hours.

The curricula for all programs consist of the following: general education, including courses from communications, the humanities, social, biological, and physical sciences, quantitative studies, and physical education; an area of specialization in a specific field of human ecology; supporting courses; at least 6 hours from two areas in the College of Human Ecology outside the professional area, as defined by the degree program; and unrestricted electives from any of the KSU departments.

Basic curriculum requirements are listed below. See specific program descriptions for details.

General education courses (37 hours minimum)

| | | |
|-----------------------|-----------------------------------|---|
| Communications (8-9) | | |
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| or | | |
| SPCH 106 | Public Speaking I | 3 |
| Social science (9) | | |
| ECON 110 | Economics I | 3 |
| Two of the following: | | |
| HDFS 110 | Introduction to Human Development | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |

| | | |
|---|--|---|
| Humanities (6) | | |
| Electives* | | 6 |
| Sciences (7) | | |
| Biological and physical sciences electives* | | 7 |
| (One course must be taken from each area; one course must include a laboratory) | | |

| | | |
|---|--------------------------------|---|
| Quantitative studies (6) | | |
| MATH 100 | College Algebra | 3 |
| or | | |
| A college-level calculus course | | 3 |
| Any 3-hour introductory statistics course | | 3 |
| or | | |
| Any 3-hour computing literacy course | | 3 |
| PE 101 | Principles of Physical Fitness | 1 |

Human ecology courses 6
At least 6 hours representing two different areas in the College of Human Ecology, outside the professional area as defined by the degree program.**

Professional and supporting courses (46-86 hours)
(See specific option/program.)

Unrestricted electives (0-22 hours)
(See specific option/program.)

Total hours for graduation 125-131

*Check with your advisor and/or the College of Human Ecology Dean's Office for a listing of categories of courses applicable toward the general education requirements for human ecology programs.

**This does not apply to B.S. in human ecology or B.S. in human ecology and mass communications, since the professional areas contain courses from at least three departments.

Transfer programs

Careful planning enables a student to transfer courses from another college or university which will apply toward specific degree requirements at KSU. A student who plans to transfer should contact the College of Human Ecology Dean's Office to verify the transferability of courses and plan the transfer program as soon as possible.

Some two-plus-two articulated programs are available for selected programs at some Kansas community colleges.

The courses listed below may be transferred to the College of Human Ecology, although not all courses are required for every program. A list of required courses for each program is available from the college dean's office.

| Courses required in all human ecology programs: | Credit hours* |
|--|---------------|
| English composition | 6 |
| Public speaking | 2-3 |
| General psychology and/or sociology | 3 |
| Macroeconomics | 3 |
| College algebra or college-level calculus (see specific program) | 3 |
| Introductory statistics and/or computing literacy | 3 |
| Transferable courses; some may apply as electives if not required for specific program: | |
| American government or political science | 3 |
| Sociology and/or psychology | 3-6 |
| Civilization or world history | 3 |
| Approved literature or modern language | 6 |
| Design I | 2 |
| Drawing I | 2 |
| General chemistry | 5 |
| Organic chemistry | 5 |
| Biology (with lab) | 4 |
| Human growth and development (life span)** | 3 |
| Food preparation and meal management | 4-6 |
| Nutrition*** | 3 |
| Family relations**** | 3 |
| Child development**** | 3 |
| Textiles (with lab)**** | 3 |

*Credit hours given above apply to courses at KSU. Some transfer courses have more or fewer hours; substitutions or adjustments usually can be made for the difference in credit hours. A maximum of one-half of the hours required for the degree may be transferred from a two-year college; 125 to 131 hours are required for graduation from the KSU College of Human Ecology. See list of required courses for major area of interest.

**Students planning for degrees in clothing and textiles, interior design, foods and nutrition, dietetics, or hotel and restaurant management should take HDFS 110 after transferring to KSU.

***Students planning for degrees in foods and nutrition, dietetics, or certification in home economics education should take FN 502, Principles of Nutrition, after transferring to KSU.

****Must be offered through a human ecology/home economics department for students preparing for certification in home economics education.

| Programs | Degrees | Departments/areas |
|---|--|---|
| Apparel and textile marketing | Bachelor of science in clothing and textiles | Clothing, textiles, and interior design |
| Apparel design | Bachelor of science in clothing and textiles | Clothing, textiles, and interior design |
| Community health and nutrition | Bachelor of science in foods and nutrition | Foods and nutrition |
| Consumer affairs | Bachelor of science in consumer and family economics | Human development and family studies |
| Dietetics Coordinated program in dietetics General dietetics | Bachelor of science in dietetics | Hotel, restaurant, institution management and dietetics |
| Early childhood education | Bachelor of science in human development and family studies | Human development and family studies |
| Family life and human development Community services Family studies (pre-law) Life span human development Human development and family studies and social work* | Bachelor of science in human development and family studies | Human development and family studies |
| Food science | Bachelor of science in foods and nutrition | Foods and nutrition |
| General human ecology | Bachelor of science in human ecology | General human ecology |
| Home economics education certification | Bachelor of science in human ecology | General human ecology |
| Hotel and restaurant management | Bachelor of science in hotel and restaurant management | Hotel, restaurant, institution management and dietetics |
| Human ecology and mass communications | Bachelor of science in human ecology and mass communications | General human ecology |
| Housing and equipment | Bachelor of science in consumer and family economics | Clothing, textiles, and interior design |
| Interior design | Bachelor of science in interior design | Clothing, textiles, and interior design |
| Nutrition and exercise sciences | Bachelor of science in foods and nutrition* | Foods and nutrition |
| Nutritional sciences (pre-medical, pre-dental, and medically related fields) | Bachelor of science in foods and nutrition | Foods and nutrition |
| Textiles | Bachelor of science in clothing and textiles | Clothing, textiles, and interior design |

*Dual degrees are awarded through the College of Arts and Sciences.

Program Options

Honors programs Undergraduate

Students with outstanding academic records are invited to participate in the human ecology honors program. High school students are selected according to their scores on the American College Test. Transfer and upper-class students with a 3.5 cumulative grade point average also are eligible. Advisors help honor students plan individual programs of study which include honors courses, seminars, and independent study.

Dual degree programs Kansas State University

Students interested in combining two degree programs must complete a minimum of 150 hours and satisfy all requirements for both degrees. Students may earn dual degrees within the College of Human Ecology, or they may combine their degree in human ecology with a degree from a different college. Contact the dean's office for more information.

The College of Human Ecology participates in the intercollegiate programs in American ethnic studies, international studies, women's studies and gerontology, described in the Secondary Majors section of this catalog.

Manhattan Christian College

The College of Human Ecology cooperates with Manhattan Christian College to provide dual degrees for students wishing to supplement their Christian service or other programs with a College of Human Ecology professional program. Students interested in dual degrees should contact the College of Human Ecology Dean's Office and Manhattan Christian College's office of the vice president for academic affairs. Joint advising is arranged for the dual degree students. With careful planning, beginning the first semester, most students can complete two degrees in five years, including study during the summers.

Graduate study

Excellent opportunities for graduate study are available for the student who wishes to continue beyond the bachelor of science degree. All departments in the college offer the master of science degree. Two doctoral degree programs are available: the Ph.D. in foods and nutrition; and the Ph.D. in human ecology, an interdepartmental degree with areas of emphasis in textiles and apparel, marriage and family therapy, family life education and consultation, life span human development, or institution management.

Graduate research and teaching assistantships are available to qualified students. Application forms and additional information can be obtained from the dean, College of Human Ecology, 119 Justin Hall, Manhattan, Kansas 66506-1401.

Placement

The College of Human Ecology cooperates with the Career Planning and Placement Center to help students locate employment opportunities in their chosen fields.

Field study opportunities

Each department in the college offers field study experience for interested and qualified students. Students earn University credit while gaining pre-professional experience. University faculty and professionals in the field provide guidance and supervision during the field experience. The length of time devoted to a field study experience varies from one or two weeks to a complete semester. Some programs provide students with a salary while completing field experiences.

Organizations and activities

Students participate in a wide range of professional activities sponsored by local and national organizations. Most subject areas within the college have a student organization to enhance the personal and professional development of members. Student associations funded by the Human Ecology College Council are:

- American Society of Interior Designers, Student Chapter
- Apparel and Textile Marketing Association
- Apparel Design Collective
- Foods and Nutrition Association
- Home Economics Education Association
- Human Development and Family Studies Association
- Human Ecology Association
- KSU Hospitality Management Society
- KSU Student Chapter of the American Association of Textile Chemists and Colorists
- Student Dietetic Association

Undergraduate students may be elected or appointed to serve as members of the Human Ecology College Council, the official college student governing body. All

students may participate in the College of Human Ecology Open House, which is held as a part of All-University Open House.

The KSU Student Human Ecology Association, an affiliate of the American Home Economics Association, is open to all students in the college.

The College of Human Ecology Ambassadors are a select group of students who serve as hosts for the college and promote college programs. CHE Ambassadors must meet scholarship requirements and participate in a training program to qualify for the CHE Ambassador program.

Qualified students are invited to join the Phi Upsilon Omicron and Omicron Nu honor societies.

Family Center

Stephan Bollman, Director

The Family Center provides applied educational experiences for graduate and undergraduate students of the College of Human Ecology while offering educational outreach programs for individuals and families of Kansas.

The center offers educational programs and consultation for individuals and families. These services are provided by students who are supervised by College of Human Ecology faculty. Specific programs are offered in marriage and family therapy, family life education, parent education, family financial counseling, and nutritional education and consultation.

Located north of Justin Hall on Campus Creek Road, the center is easily available to the students, faculty, and community.

Clothing, Textiles, and Interior Design

Mary Don Peterson, Head

Professors Burke, McCullough,* Reagan,* and Stowe; Associate Professors Boschetti,* Corbin, Peterson,* and White;* Assistant Professors Annis,* Huck,* Minshall,* Munson,* Potnis, and Villasi;* Instructors Cannon, Hedrick, McComas, and Schlageck; Emeriti: Professors Brockman,* Slinkman, and Tucker; Associate Professors Hill,* H. Howe,* and J. Howe; Assistant Professors Craigie* and Newby.

The Department of Clothing, Textiles, and Interior Design focuses on meeting human needs through the analysis, design, production, and evaluation of components in the near environment.

Undergraduate study

Programs leading to a bachelor of science degree are: apparel and textile marketing, apparel design, housing and equipment, interior design, and textiles. Students are encouraged to participate in field experiences to further understanding of their chosen professions.

Facilities include well-equipped studios and laboratories for interior design, housing, household equipment, apparel design and construction, and textile analysis. An extensive historic textile and costume collection, housed in a climate-controlled storage facility in Justin Hall, is available for study.

Students in all programs participate in field trips and study tours to production and design centers across the country. Student chapters of two professional organizations, the American Society of Interior Designers (ASID) and the American Association of Textile Chemists and Colorists (AATCC), offer students opportunities for leadership and involvement.

Graduate study

Programs leading to the master of science degree are offered in functional and protective apparel, apparel and textile marketing, historic textiles and costume, interior design, preservation of historic interiors, social/psychological aspects of clothing, textile conservation, and textile science. Individual programs of study are planned to meet the personal and professional needs of each student.

The Department of Clothing, Textiles, and Interior Design participates in the graduate program for the Ph.D. in human ecology with a specialization in textiles and apparel.

Undergraduate programs

Apparel and textile marketing

Bachelor of science in clothing and textiles

The apparel and textile marketing program prepares students for careers in the production, distribution, and marketing of apparel and textile products. Professional courses are supplemented with study in business, including marketing, accounting, and management. During the junior or senior year, students complete an eight-week supervised field experience in textile production, retail, or manufacturing.

General education courses (41-47 hours)

| | | |
|-----------|---|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking 1A | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| ECON 110 | Economics I | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| ECON 120 | Economics II | 3 |
| | Approved economics course at 500 level or above | 3 |
| | (if STAT 350 and 351 are not taken) | |
| HIST 102 | Western Civilization: The Modern Era | 3 |

Biological science elective 3-4
 CHM 110 General Chemistry 5
 STAT 350 Business and Economics
 Statistics I 3
and
 STAT 351 Business and Economics
 Statistics II 3
 (if approved economics course at
 500 level or above is not taken)
 MATH 100 College Algebra 3
 CIS 200 Fundamentals of Computer
 Programming 2
and
 CIS 206 BASIC Language Lab 2
or
 CIS 110 Introduction to Personal
 Computers 3
or
 HDFS 120 Microcomputers in Human
 Services 3
 PE 101 Principles of Physical Fitness 1
Professional courses (44-45 hours)
 CT 155 Fundamentals of Apparel
 Evaluation 3
 CT 220 Fundamentals of Apparel Design
 and Production 3
 CT 230 Apparel and Textile Marketing 3
 CT 260 Textiles 3
 CT 330 Clothing and Society 3
 CT 395 Visual Merchandising 3
 CT 430 Professional Development of
 Apparel and Textile Marketing 1
 CT 435 Apparel and Textile Promotion 3
 CT 450 Apparel and Textile Marketing
 Field Experience 5
or
 MKTG 541 Retailing 3
and
 MKTG 542 Sales Management 3
 CT 520 Textile Merchandise Profit Analysis 3
 CT 536 Merchandising Concepts 4
 CT 545 Textile and Apparel Industry 3
 CT 570 Textiles for Merchandising 3
 CT 631 History of Costume from 1780 to
 Present 3
 CT 650 Clothing and Textile Study Tour 1
Supporting courses (26 hours)
 HDFS 110 Introduction to Human
 Development 3
 HDFS 400 Family Economics 3
 ART 100 Design I 2
 ACCTG 211 Financial Accounting 3
 MANGT 420 Management Concepts 3
 MKTG 400 Marketing 3
 MANGT 531 Personnel and Wage
 Administration 3
or
 PSYCH 560 Industrial Psychology 3
 JMC 320 Principles of Advertising 3
or
 JMC 512 Introduction to Public Relations 3
 MKTG 450 Consumer Behavior 3
or
 PSYCH 545 Consumer Psychology 3
Unrestricted electives 7-14
Total for graduation 125

Apparel design

Bachelor of science in clothing and textiles

The apparel design program provides students with the basic skills and competence required to enter the apparel industry, including garment design, fashion illustration, and pattern theory and development. The course work emphasizes commercial and industrial applications of design, and incorporates technology used in industry such as computer-aided apparel

design. Students have access to the historic textile and costume collection for research and special projects.

General education courses (44-47 hours)

ENGL 100 English Composition I 3
 ENGL 120 English Composition II 3
 SPCH 105 Public Speaking IA 2
or
 SPCH 106 Public Speaking I 3
 ECON 110 Economics I 3
 ECON 120 Economics II 3
 PSYCH 110 General Psychology 3
 SOCIO 211 Introduction to Sociology 3
 ART 195 Survey of Art History I 3
 ART 196 Survey of Art History II 3
 HIST 102 Western Civilization: Modern Era 3
 Biological science elective 3-4
 PHYS 101 The Physical World I 3
and
 PHYS 103 The Physical World I Lab 1
or
 CHM 110 General Chemistry 5
 MATH 100 College Algebra 3
 CIS 200 Fundamentals of Computer
 Programming 2
 CIS 206 BASIC Language Lab 2
 PE 101 Principles of Physical Fitness 1
Professional courses (62 hours)
 CT 150 Principles of Clothing
 Construction 3
 CT 220 Fundamentals of Apparel Design
 and Production 3
 CT 230 Apparel and Textile Marketing 3
 CT 260 Textiles 3
 CT 300 Advanced Clothing Construction 3
 CT 315 Fashion Drawing and Illustration 3
 CT 330 Clothing and Society 3
 CT 400 Tailoring 3
 CT 410 Theory of Pattern Design I 3
 CT 420 Design by Draping 3
 CT 485 Problems in Apparel Design 1
 CT 500 Intermediate Apparel Design 3
 CT 515 Theory of Pattern Design II 3
 CT 540 Advanced Apparel Design 3
 CT 545 Textile and Apparel Industry 3
 CT 630 History of Costume to 1780 3
 CT 631 History of Costume 1780 to
 Present 3
 ID 680 Historic Fabric Design 3
 ART 100 Design I 2
 ART 190 Drawing I 2
 ART 200 Design II 2
 ART 210 Drawing II 2
 ART 225 Figure Drawing I 2

Supporting courses (15 hours)

Two of the following courses:
 HDFS 110 Introduction to Human
 Development 3
or
 HDFS 350 Family Relationships and Sex
 Roles 3
 HDFS 400 Family Economics 3
 FN 132 Basic Nutrition 3
or
 FN 133 Food for Man 3
 A minimum of 9 hours from the following courses:
 ECON 620 Labor Economics 3
 ECON 640 Industrial Organization and Public
 Policy 3
 ECON 681 International Trade 3
 MANGT 202 Small Business Operations 3
 MANGT 420 Management Concepts 3
 MANGT 530 Industrial and Labor Relations 3
 MANGT 630 Labor Relations Law 3
 MKTG 400 Marketing 3
 MKTG 450 Consumer Behavior 3
 PSYCH 560 Industrial Psychology 3

Unrestricted electives 4-7

Total for graduation 128

Housing and equipment

Bachelor of science in consumer and family economics

In the housing and equipment program, students elect the professional specialization that best suits their interests and needs. Specializations include community planning, housing counseling, real estate, house planning, and kitchen design.

General education courses (37-38 hours)

ENGL 100 English Composition I 3
 ENGL 120 English Composition II 3
 SPCH 105 Public Speaking IA 2
or
 SPCH 106 Public Speaking I 3
 ECON 110 Economics I 3
 PSYCH 110 General Psychology 3
 BIOL 198 Principles of Biology 4
 MATH 100 College Algebra 3
 STAT 320 Elements of Statistics 3
 Humanities electives 3
 PE 101 Principles of Physical Fitness 1

Students concentrating in housing are required to take:
 POLSC 520 State and Local Government 3
 SOCIO 211 Introduction to Sociology 3
 SOCIO 530 Population and Human Ecology 3

Students concentrating in household equipment are required to take:

CHM 110 General Chemistry 5
 PHYS 115 Descriptive Physics 4

Human ecology (12 hours)

CT 330 Clothing and Society 3
or
 ID 101 Design for Contemporary
 Living 3
 HDFS 400 Family Economics 3
 FN 132 Basic Nutrition 3
or
 FN 502 Principles of Nutrition 3
 HDFS 110 Introduction to Human
 Development 3
or
 HDFS 350 Family Relationships and Sex
 Roles 3

Professional and supporting courses (40-42)

HDFS 105 Introduction to Personal and Family
 Finance 3
 FEC 420 Housing 3
 FEC 440 Home Appliance Design and
 Evaluation 3
 HDFS 460 Family Resource Management
 Theory and Application 3
 FEC 660 Kitchen and Utility Area
 Planning 3
 HDFS 715 Families in the American
 Economy 3
or
 HDFS 605 Consumers and the Market 3
 HDFS 350 Family Relationships and Sex
 Roles (if not taken previously) 3
or
 HDFS 550 The Family 3

Professional courses for household equipment or housing* 19-21

Students concentrating in household equipment are required to take:
 Biological science elective 3
 CT 260 Textiles 3
 FEC 650 Consumer Product Safety 3
 FEC 740 Advanced Household Equipment 3
 FN 300 Food Preparation and Meal
 Management 4
 JMC 275 News and Feature Writing 3

Students concentrating in housing are required to take:
 FEC 415 Consumer Law 3
 FEC 625 Consumer and Energy Issues in
 Housing 3

| | | |
|-----------------------------------|------------------------------------|--------------|
| HDFS 715 | Families in the American Economy** | 3 |
| HDFS 605 | Consumers and the Market** | 3 |
| FEC 720 | Housing Requirements of Families | 3 |
| PLAN 315 | Introduction to Planning | 3 |
| PLAN 750 | Housing Programs and Policies | 3 |
| SOCIO 531 | Urban Sociology | 3 |
| Professional electives | | 18* |
| Unrestricted electives | | 15-18 |
| Total hours for graduation | | 125 |

*Selected in consultation with faculty advisor.

**If not taken as a supporting course.

Interior design

Bachelor of science in interior design

The interior design program provides students with the technical skills necessary to translate a design concept into three-dimensional reality. Special emphasis is placed on the design of total space to meet human needs. Considerations include space planning, selection and specification of interior materials, environmental systems (i.e., lighting, heating, cooling, ventilation, and plumbing), structural components of buildings, and the creation of working, specification, and bid/construction documents. Students also study the history of interior design, communication and public relations, and business. Supervised field experiences are encouraged.

The interior design program is accredited by FIDER (Foundation for Interior Designer Education and Research).

General education courses (40-43 hours)

| | | |
|-----------------------------|--|-----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| ECON 110 | Economics I | 3 |
| PSYCH 110 | General Psychology | 3 |
| Social science elective | | 3 |
| ART 195 | Survey of Art History I | 3 |
| ART 196 | Survey of Art History II | 3 |
| HIST 101 | Western Civilization: Rise of Europe | 3 |
| Biological science elective | | 3-4 |
| Physical science elective | | 3-4 |
| MATH 100 | College Algebra | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS | Computer language lab (200-level course) | 2 |
| PE 101 | Principles of Physical Fitness | 1 |

Professional courses (55-57 hours)

| | | |
|--------|--|---|
| ID 240 | Interior Design Studio I | 3 |
| ID 260 | Interior Design Graphics | 3 |
| ID 320 | History of Interior Design I | 3 |
| ID 340 | Interior Design Studio II | 3 |
| ID 360 | History of Interior Design II | 3 |
| ID 435 | Interior Design Systems | 3 |
| ID 440 | Interior Design Studio III | 3 |
| ID 460 | Interior Design Practices and Procedures | 3 |
| ID 540 | Interior Design Studio IV | 3 |
| ID 640 | Interior Design Studio V | 3 |
| ID 650 | Contemporary Homes | 3 |
| ID 680 | Historic Fabric Design | 3 |
| | or | |
| ID 760 | Historic Preservation | 3 |

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| ID 751 | Designing for Exceptional Needs | 3 |
| ID 780 | Interior Design Seminar | 2 |
| ART 100 | Design I | 2 |
| ART 190 | Drawing I | 2 |
| ART 200 | Design II | 2 |
| Two of the following courses: | | |
| ART 230 | Sculpture I | 2 |
| ART 260 | Design in the Crafts | 2 |
| ART 265 | Ceramics I | 2 |
| ART 270 | Metalsmithing and Jewelry | 2 |
| ART 275 | Weaving | 2 |

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| Two of the following courses: | | |
| ART 205 | Graphic Design Techniques | 2 |
| ART 215 | Design III | 2 |
| ART 220 | Watercolor I | 2 |
| ART 245 | Painting I | 2 |
| ART 565 | Ceramics II | 3 |
| ART 620 | Watercolor II | 3 |
| ART 645 | Sculpture II | 3 |

Supporting courses (29 hours)

| | | |
|----------------------------------|---|-----|
| HDFS | Human development and family studies elective | 3 |
| FEC 660 | Kitchen and Utility Area Planning | 3 |
| | or | |
| FEC | Family economics elective | 3 |
| CT 260 | Textiles | 3 |
| ARCH 301 | Appreciation of Architecture | 3 |
| Eleven hours from the following: | | |
| LAR 510 | Landscape Architecture Delineation Techniques | 2 |
| ID 600 | Interior Design Field Experience | 4 |
| CT 395 | Visual Merchandising | 3 |
| HORT 325 | Indoor Plants and Flowers | 2 |
| ENDV 220 | Theory of Environmental Design I | 2 |
| ENDV 651 | Preservation Principles and Methods | 3 |
| PLAN 630 | Computer Application in Planning and Design | 1-3 |

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| Two of the following courses: | | |
| ACCTG 211 | Financial Accounting | 3 |
| FINAN 552 | Real Estate | 3 |
| MKTG 400 | Marketing | 3 |
| MKTG 450 | Consumer Behavior | 3 |
| MKTG 541 | Retailing | 3 |
| JMC 512 | Introduction to Public Relations | 3 |

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|-------------------------------|--|------------|
| Unrestricted electives | | 0-4 |
| Total for graduation | | 128 |

Textiles

Bachelor of science in clothing and textiles

Students in the textiles program emphasize either textile science or textile chemistry by choosing the appropriate professional and supporting courses. The textile science emphasis is for students interested in the consumer aspects of the textile industry and includes quality control, fiber and fabric development, and textile testing. The textile chemistry emphasis incorporates course requirements for traditional chemistry majors, while providing students with a specialization in an applied field. Textile chemistry leads to careers in research and development with the textile industry.

General education courses (44-48 hours)

| | | |
|-----------|---------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| ECON 110 | Economics I | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |

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|------------------------------------|--|------------|
| HIST 101 | Western Civilization: Rise of Europe | 3 |
| Humanities elective | | 3 |
| Biological science elective | | 3-4 |
| CHM 210 | Chemistry I | 4 |
| | and | |
| CHM 230 | Chemistry II | 4 |
| | and | |
| CHM 271 | Chemical Analysis | 4 |
| | or | |
| CHM 220 | Chemical Principles I | 5 |
| | and | |
| CHM 250 | Chemical Principles II | 5 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| CIS | Computer language lab (200-level course) | 2 |
| STAT 320 | Elements of Statistics | 3 |
| PE 101 | Principles of Physical Fitness | 1 |

Select Program I or II

Program I: Textile Science

Professional courses (31-33 hours)

| | | |
|--------|---|---|
| CT 260 | Textiles | 3 |
| CT 350 | Fiber Science | 3 |
| CT 545 | Textile and Apparel Industry | 3 |
| CT 620 | Textile Yarns and Fabrics | 3 |
| CT 680 | Physical Analysis of Textiles | 3 |
| CT 746 | Textile Dyeing and Printing | 4 |
| CT 747 | Textile Finishes | 3 |
| CT 765 | Chemical and Optical Analysis of Textiles | 3 |

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|--------------------------------|----------------------------------|-----|
| CT 650 | Clothing and Textiles Study Tour | 1-2 |
| | or | |
| Clothing and textiles elective | | 3 |

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|---------|-------------------------------|---|
| CHM 350 | General Organic Chemistry | 3 |
| | and | |
| CHM 351 | General Organic Chemistry Lab | 2 |
| | or | |
| CHM 531 | Organic Chemistry I | 3 |
| | and | |
| CHM 532 | Organic Chemistry Lab | 2 |

Supporting courses (28 hours)

| | | |
|---|------------------------------------|---|
| FN 132 | Basic Nutrition | 3 |
| HDFS 400 | Family Economics | 3 |
| CT 330 | Clothing and Society | 3 |
| MATH 100 | College Algebra | 3 |
| | or | |
| MATH | Math elective (200 level or above) | 3 |
| PHYS 115 | Descriptive Physics | 4 |
| ID 680 | Historic Fabric Design | 3 |
| Three courses from the College of Business Administration | | 9 |

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| Unrestricted electives | | 16-22 |
| Total for graduation | | 125 |

Program II: Textile Chemistry

Professional Courses (41-43 hours)

| | | |
|--------|---|---|
| CT 260 | Textiles | 3 |
| CT 350 | Fiber Science | 3 |
| CT 545 | Textile and Apparel Industry | 3 |
| CT 620 | Textile Yarns and Fabrics | 3 |
| CT 746 | Textile Dyeing and Printing | 4 |
| CT 747 | Textile Finishes | 3 |
| CT 680 | Physical Analysis of Textiles | 3 |
| CT 765 | Chemical and Optical Analysis of Textiles | 3 |

| | | |
|--------------------------------|----------------------------------|-----|
| CT 650 | Clothing and Textiles Study Tour | 1-2 |
| | or | |
| Clothing and textiles elective | | 3 |

| | | |
|---------|----------------------------|---|
| CHM 531 | Organic Chemistry I | 3 |
| CHM 532 | Organic Chemistry Lab | 2 |
| CHM 550 | Organic Chemistry II | 3 |
| CHM 551 | Advanced Organic Lab | 2 |
| CHM 545 | Chemical Separations | 2 |
| CHM 500 | General Physical Chemistry | 3 |
| | or | |
| CHM 585 | Physical Chemistry I | 3 |

Supporting courses (25 hours)

| | | |
|----------|-------------------------------------|---|
| FN 132 | Basic Nutrition | 3 |
| HDFS 400 | Family Economics | 3 |
| CT 330 | Clothing and Society | 3 |
| MATH 220 | Analytical Geometry and Calculus I | 4 |
| MATH 221 | Analytical Geometry and Calculus II | 4 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |

Unrestricted electives 9-15

Total for graduation 125

Courses in clothing and textiles**Undergraduate credit****CT 150. Principles of Clothing Construction.** (3) I, II.

Clothing selection; pattern alteration and fitting techniques; construction methods as applied to woven and knitted fabrics. Six hours lab a week. CT-150-1-1303

CT 155. Fundamentals of Apparel Evaluation. (3) I, II. Evaluation of garment construction in ready-to-wear; fit, sizing, and alteration of ready-to-wear garments; evaluation of garment construction through sample development. Two hours lec. and two hours lab a week. CT-155-0-1303

CT 220. Fundamentals of Apparel Design and Production. (3) I, II. Application of the elements and principles of design to apparel design; introduction to apparel production and the work of the apparel designer; basic fashion drawing and figure study. Two hours lec. and two hours rec. a week. CT-220-0-1303

CT 230. Apparel and Textile Marketing. (3) II. Overview of the processes involved in the marketing of fashion goods. CT-230-0-1303

CT 260. Textiles. (3) I, II. Fundamentals of textiles as related to the problems of the consumer. Two hours rec. and two hours lab a week. Pr.: Sophomore standing. CT-260-1-1303

CT 300. Advanced Clothing Construction. (3) II. Advanced techniques and experimentation with diverse fabrics; construction of a couture garment; principles of constructing men's wear. Six hours lab a week. Pr.: CT 150; and CT 260 or conc. enrollment. CT-300-1-1303

CT 315. Fashion Drawing and Illustration. (3) I. In-depth study of the fashion figure and fashion drawing; fundamental fashion layout; development and organization of a design portfolio. Six hours lab a week. Pr.: ART 225 or conc. enrollment; and CT 220. CT-315-1-1303

CT 330. Clothing and Society. (3) I. Cultural, social, psychological, and economic aspects of clothing needs and practices of individuals and groups. Three hours lec. Pr.: SOCIO 211 or PSYCH 110. CT-330-0-1303

CT 350. Fiber Science. (3) II. Introduction to structures and properties of fibers, including polymer science. Pr.: MATH 100 and CHM 350. CT-350-0-1303

CT 395. Visual Merchandising. (3) I, II. Basic principles and techniques of merchandising display; experience through cooperation with retail stores. Pr.: ART 100. CT-395-1-1303

CT 400. Tailoring. (3) I. Beginning tailoring techniques applied in the construction of a coat or suit based on a commercial pattern. Six hours lab a week. Pr.: CT 300. CT-400-1-1303

CT 410. Theory of Pattern Design I. (3) II. Introduction to basic principles and techniques used in the development, alteration, and styling of patterns through use of pattern drafting and flat pattern design. Pr.: CT 150. CT-410-1-1303

CT 420. Design by Draping. (3) I. Principles and techniques of design by draping in muslin and fashion fabric. Six hours lab a week. Pr.: CT 300 and 410. CT-420-1-1303

CT 430. Professional Development for Apparel and Textile Marketing. (1) II. Preparation for a six-week fashion marketing field experience. Exploration of the relationship between career goals and field experience. Interviewing for field experience placement. Pr.: CT 230 or conc. enrollment; major in CT option. CT-430-0-1303

CT 435. Apparel and Textile Promotion. (3) II. Promotion of fashion merchandise including advertising, display, special events, and public relations. Pr.: CT 230, 395; and JMC 320 or S12. CT-435-0-1303

CT 450. Apparel and Textile Marketing Field Experience. (5) I. Supervised work experience in the apparel and textile industry. Pr.: CT 230, 430; ACCTG 211; junior or senior in CT option, 2.5 cumulative GPA, and 2.5 GPA in professional courses. CT-450-2-1303

CT 485. Problems in Apparel Design. (Var.) I, II, S. Independent study. Pr.: Consent of instructor. CT-485-3-1303

CT 499. Problems in Clothing and Textiles. (Var.) I, II, S. Independent study. Pr.: Consent of instructor. CT-499-3-1303

Undergraduate and graduate credit in minor field

CT 500. Intermediate Apparel Design. (3) I. Creation and analysis of designs for body types in the size ranges produced by the apparel industry; creation and modification of industrial patterns suitable for mass production. Study and application of computer-aided apparel design. Six hours lab a week. Pr.: ART 200; CT 315, 420, and 515; CIS 200 and 206. CT-500-1-1303

CT 515. Theory of Pattern Design II. (3) II. Advanced techniques of pattern development; elementary application of pattern techniques to original designs; introduction to industrial uses of pattern design. Six hours lab a week. Pr.: CT 410. CT-515-1-1303

CT 520. Textile Merchandise Profit Analysis. (3) II, S. Concepts, practices, and procedures for analyzing textile merchandise profit including the development of user skills in the application of various software packages for data analyses and decision making in apparel and textile marketing. Pr.: ACCTG 211; CIS 110 or 200 or HDFS 120; and MKTG 400 or conc. enrollment. CT-520-1-1303

CT 525. Pattern Drafting Techniques. (3) Alternate S. Study of advanced pattern drafting techniques with emphasis on the bodice and pants for different figure types. Six hours lab a week. Pr.: CT 410. CT-525-1-1303

CT 536. Merchandising Concepts. (4) I. Analysis of the elements, processes, and controls involved in fashion merchandising. Pr.: CT 230 and junior or senior standing. CT-536-0-1303

CT 540. Advanced Apparel Design. (3) II. Analysis of high fashion from origin of the haute couture to contemporary designers; use of inspiration sources for executing original design solutions; final presentation of design portfolio; advanced study of computer-aided design software as it relates to apparel design. Six hours lab a week. Pr.: CT 500. CT-540-1-1303

CT 545. Textile and Apparel Industry. (3) I. Analysis of fiber, textile, and apparel production; industry structure; impact of government regulations on production. Pr.: ECON 110. CT-545-0-1303

CT 570. Textiles for Merchandising. (3) I. Properties of fibers, yarns, fabrics, finishes, and dyes; emphasis on end-use performance of textiles. Pr.: CT 260. CT-570-1-1303

Undergraduate and graduate credit

CT 600. Textile Analysis. (3) Alternate S. Laboratory techniques used to characterize textile structures with emphasis on fiber, color, finish, care, and aging. Pr.: CT 260 and CHM 110. Not open to textile science majors. CT-600-1-1303

CT 620. Textile Yarn and Fabrics. (3) II. Technological, structural, and functional aspects of yarns and fabrics. Pr.: CT 260. CT-620-0-1303

CT 630. History of Costume to 1780. (3) II. Interrelationship of costume and social, cultural, political, and economic environments from antiquity to 1780 with emphasis on evolution of garment design and sources of costume information. Pr.: ART 195 and 196; or HIST 101. CT-630-0-1303

CT 631. History of Costume from 1780 to Present. (3) II. Interrelationship of costume and social, cultural, political, and economic environments from 1780 to the present with emphasis on effects of the industrial revolution, dress reform movements, ready-to-wear development, and haute couture. Pr.: HIST 102. CT-631-0-1303

CT 650. Clothing and Textiles Study Tour. (1-2) Alternate II, S. Supervised off-campus tour of facilities where textile products are designed, manufactured, tested, marketed, exhibited, and/or conserved. Pr.: CT 260 and 6 hours clothing and textiles. CT-650-2-1303

CT 680. Physical Analysis of Textiles. (3) I. Theory, principles, and procedures in evaluating the physical properties of textile fibers, yarns, fabrics, and products for apparel, interior furnishings, and industrial uses. Two hours lec. and three hours lab a week. Pr.: CT 260. CT-680-1-1303

CT 710. Advanced Tailoring. (3) II, alternate S. Construction of a garment, using different fabrics and custom tailoring techniques. Pr.: CT 400; and CT 410 or 420. CT-710-1-1303

CT 715. Advanced Pattern Design. (3) I. Application of pattern design with emphasis on the development of patterns for original designs. Six hours lab a week. Can be repeated for credit. Pr.: CT 410. CT-715-1-1303

CT 730. Textile Conservation. (3) I, alternate years. Scientific theories of textile conservation related to fiber degradation, storage, repair, cleaning, and exhibition of historic items. Laboratory experience in solving conservation problems related to historic textiles. Two hours lec., two hours lab a week. Pr.: CHM 110, 190; and CT 620 or ID 680. CT-730-1-1303

CT 741. Polymer Science. (3) I, in alternate years. Theory, application, and methods of structural analysis with emphasis on synthetic polymers. Pr.: CHM 350 and junior standing. CT-741-0-1303

CT 742. Textile Fibers. (3) I. In-depth study of fibers. Two hours rec. and three hours lab a week. Pr.: CT 260; and CHM 191 or 351. CT-742-0-1303

CT 743. Textile Yarns. (3) I, in alternate years. Structure and performance of multifilament, spun, simple, and complex yarns. Pr.: CT 350 or 742. CT-743-1-1303

CT 746. Textile Dyeing and Printing. (4) II. In-depth study of color systems, colorimetry, physical and chemical properties of dyes, methods of dye-fiber association, and industrial dyeing and printing methods. Two hours lec. and six hours lab a week. Pr.: CT 350 or 742. CT-746-1-1303

CT 747. Textile Finishes. (3) II. Theory, application, evaluation, and identification of finishes and auxiliary products which are applied to textile fibers, yarns, and fabrics. Two hours lec. and three hours lab a week. Pr.: CT 350 or 742. CT-747-1-1303

CT 760. Clothing and Textiles Seminar. (Var.) I, II. Discussion of current developments in the field. May be taken more than one semester with consent of student's advisory committee. Pr.: Eight hours credit basic to field involved. CT-760-0-1303

CT 765. Chemical and Optical Analysis of Textiles. (3) II. Application of organic chemistry and optical analysis to fibers, dyes, and finishes. Two hours lec. and three hours lab a week. Pr.: CT 350 or 742. CT-765-I-1303

CT 770. Practicum in Clothing and Textiles. (Var.) I, II, S. Preplanned and supervised off-campus experience in business, industry, museums, government agencies, or the cooperative extension service. May be repeated up to 6 hours. Pr.: Twelve hours in clothing and textiles and consent of department head. CT-770-2-1303

CT 775. Experimental Textiles. (Var.) On sufficient demand. Individual investigation into textile research. Pr.: CT 350 or 742; CT 720. CT-775-I-1303

CT 780. Problems in Clothing and Textiles. (Var.) I, II, S. Work is offered in apparel designing, textiles, history of costume, clothing economics. Pr.: Senior or graduate standing; consent of instructor. CT-780-3-1303

CT 785. Problems in Apparel Design. (Var.) I, II, S. Problems planned with the student to meet particular needs. Pr.: CT 500 or consent of instructor. CT-785-3-1303

Graduate credit

CT 820. Textiles and the Thermal Environment. (1-3) II, S, in alternate years. Fundamentals of textile insulation, its measurement and prediction for different types of textile products; the study and measurement of human response to thermal environmental factors and textile insulation. Pr.: CT 260; and STAT 702 or 703. CT-820-0-1303

CT 825. Advanced Historic Textiles. (3) I, alternate years. Analysis of the interaction of technology with worldwide historic textile designs from prehistoric to modern times (1900). Laboratory assessment of design production through fiber, yarn, fabric, finishing, and tools used in each area. Two hours lec., two hours lab a week. Pr.: ID 680. CT-825-1-1303

CT 831. Experimental Clothing Construction. (2-3) I, alternate S. Recent developments in clothing construction, utilizing experimental projects and innovative methods. Six hours lab a week. Pr.: Six hours of clothing and textiles. CT-831-I-1303

CT 835. Textile and Apparel Economics. (3) I. Analysis of the fiber, textile, and apparel industries. Issues in the production and distribution of textile products with emphasis on international trade and government involvement. Pr.: ECON 120, and 6 hours in clothing and textiles at 400 level or above. CT-835-0-1303

CT 840. Family Consumption of Textile Products. (3) II. Factors that affect family consumption of apparel, draperies, upholstery, floor coverings, wall coverings, and other textile products; changes in textile consumption patterns over the life cycle. Textile product characteristics, end-use performance, quality evaluation, and maintenance. Pr.: MKTG 540 or FEC 605. CT-840-0-1303

CT 845. Clothing and Human Behavior. (3) II, alternate years. Analysis of the effects of the psychological, cultural, and social aspects of clothing upon human behavior. Pr.: CT 330 and 6 hours of clothing and textiles. CT-845-0-1303

CT 850. Clothing and Textile Literature. (2) II, alternate S. Critical review of current literature with implications for future research; analysis of research methodologies. Pr.: A graduate level course in statistics and six hours in the field. CT-850-3-1303

CT 855. Readings in Clothing and Textiles. (1-2) I, II, S. Directed reading and study of selected topics in clothing and textiles. Pr.: CT 850. CT-855-3-1303

CT 860. Contemporary Topics in Clothing and Textiles. (2-3) I, alternate S. Analysis of social and environmental factors related to clothing and textiles. May be taken more than one semester with consent of student's advisory committee. Pr.: Eight hours of credit basic to field. CT-860-0-1303

CT 865. Historic Costume and Textile Collection Management. (2) II, alternate years. Collection policy development, registration, and cataloging of historic costume and textile collections, physical processing of objects, and usage of collections. One hour lec. and two hours lab a week. Pr.: CT 631 and 730; and ID 680. CT-865-I-1303

CT 898. Master's Report. (1 or 2) I, II, S. Written report to meet the requirements for the degree master of science. Subject chosen in consultation with major instructor. Pr.: Consent of department head. CT-898-4-1303

CT 899. Master's Thesis Research in Clothing and Textiles. (Var.) I, II, S. Research in clothing or textiles for the master's thesis. Pr.: Consent of major professor. CT-899-4-1303

CT 910. Advanced Textile Dyeing and Finishing. (3) I, in alternate years. Advanced study of the physical and chemical principles involved in the preparation, dyeing, and finishing of textiles. Two hours lec. and three hours lab a week. Pr.: CT 746 and 747. CT-910-I-1303

CT 980. Professional Development Seminar. (3) II, in alternate years. Current research, topics, and issues relevant to professionals in clothing and textiles. Pr.: CT 851. CT-980-0-1303

CT 990. Dissertation Proposal Seminar. (1) I, II. Presentation and discussion of proposals for dissertation research. Pr.: Six hours of statistics, 3 hours of research design or methods, and consent of major professor. CT-990-0-1303.

CT 999. Dissertation Research In Clothing and Textiles. (Var.) I, II, S. Research in clothing or textiles for the doctoral dissertation. Pr.: Consent of major professor. CT-999-4-1303

Courses in family economics

Undergraduate credit

FEC 420. Housing. (3) I, II. Socioeconomic aspects of housing, focusing on decisions made at the family, community, and national levels. Topics include finance, energy, space requirements, and special groups. Two hours lec. and two hours lab a week. Pr.: Sophomore standing. FEC-420-I-1304

FEC 440. Home Appliance Design and Evaluation. (3) I, II. Principles of design, operation, and care of appliances used in the home; methods of evaluating appliance performance; lab demonstrates application of principles. Two hours lec. and three hours lab a week. FEC-440-I-1302

Undergraduate and graduate credit

FEC 625. Consumer and Energy Issues in Housing. (3) I, S. An examination of current housing issues including conditions, regulations, finance, and policy as they relate to the consumer. Pr.: SOCIO 211, ECON 110, and FEC 420. FEC-625-0-1304

FEC 630. Household Equipment Theory. (3) I, S. Analytical study of appliance design, performance, and evaluation concepts for application in consumer decision making. Not open to students with credit in FEC 440. Six hours rec. and lab a week. Pr.: Four hours lab science course. FEC-630-I-1302

FEC 650. Consumer Product Safety. (3) I. Evaluation of measures that assure consumer public of safe products, consumer recourse, business protection and responsibility, methods of surveillance, investigation, and reporting. Pr.: Ten hours of 400 or higher level courses in engineering or home economics. FEC-650-0-1304

FEC 660. Kitchen and Utility Area Planning. (3) II. Functional and research basis for planning and arranging based on activity analysis, equipment, materials, lighting, and ventilation. Two hours lec. and two hours lab a week. Pr.: FEC 460 or ID 240 or ARCH 261. FEC-660-I-1302

FEC 720. Housing Requirements of Families. (3) II. Housing needs and requirements of families as influenced by social norms, societal values, family activities and preferences, and economic and political constraints. Pr.: FEC 420. FEC-720-0-1304

FEC 740. Advanced Household Equipment. (3) II. Application of basic electrical, optical, refrigeration, heat transfer, psychometric, and detergent chemistry principles to the study of household equipment, with emphasis on techniques and instrumentation for consumer testing. Six hours rec. and lab a week. Pr.: FEC 440, PHYS 115, and senior or graduate standing. FEC-740-I-1304

Graduate credit

FEC 825. Social Effects of the Housing Environment. (3) II. A critical analysis of the literature on the social influences on the family and the individual attributable to the nature of the housing and neighborhood environment. Alternative physical determinist and socio-cultural interpretations are developed. Pr.: FEC 420 and STAT 702 or 703. FEC-825-0-1304

FEC 840. Experimental Methods in Household Equipment. (2) I. In alternate years. Philosophy of household equipment evaluation and experimentation; emphasis upon instrumentation, selection of variables, and data analysis. Pr.: A course in statistics and FEC 740. FEC-840-I-1302

FEC 920. Housing Economics. (3) II, S. Analysis of economic research related to consumer and government decisions about housing, including financing, regulation, subsidy programs, energy conservation, and choice of characteristics. Pr.: ECON 520, course in statistics, and two courses in housing, urban economics, or planning. FEC-920-0-1304

Courses in interior design

Undergraduate credit

ID 101. Design for Contemporary Living. (3) I. Development of critical awareness of the application of principles of design in contemporary living. ID-101-0-1399

ID 240. Interior Design Studio I. (3) I, II. Aesthetic, social, and functional aspects of the home and its furnishings. Six hours studio a week. Pr.: ART 100. ID-240-I-1399

ID 260. Interior Design Graphics. (3) I, II. Development of graphic communication skills used by interior designers. Six hours studio a week. ID-260-I-1399

ID 320. History of Interior Design I. (3) I. A historic survey of furniture, textiles, and the minor arts from antiquity to 1850. Progressive development of design and ornamentation characteristics as related to interiors. Pr.: ART 195; ART 196 or conc. enrollment; and HIST 101. ID-320-0-1399

ID 340. Interior Design Studio II. (3) I, II. Introduction to design process. Emphasis on space planning and selection of materials and furnishings within living environment. Six hours studio a week. Pr.: ART 190; ID 260 or equiv.; and ID 240. ID-340-I-1399

ID 360. History of Interior Design II. (3) II. A survey of modern design evolution in furniture, textiles, and the minor arts from 1850 to the present. Concepts, development, and application of modern technology to contemporary design and interiors. Pr.: HIST 101. ID-360-0-1399

ID 435. Interior Design Systems. (3) I, II. Analysis of lighting, heating, ventilating, acoustics, and air conditioning systems in residential interior design; principles, performance requirements, and components related to aesthetic, functional, and behavioral interior planning; relationship among the systems, properties, methods, techniques, and materials in interior design. Pr.: ID 340 or conc. enrollment. ID-435-0-1399

ID 440. Interior Design Studio III. (3) I, II. Interior design problem solving in residential interiors. Graphic and verbal presentation of solutions. Six hours studio a week. Pr.: ID 340. ID-440-I-1399

ID 460. Interior Design Practices and Procedures. (3) II. Professional ethics and business practices; sources, materials, and construction methods used in home furnishings and residential interiors. Pr.: ID 340 or conc. enrollment. ID-460-0-1399

ID 499. Problems in Interior Design. (Var.) I, II, S. Independent study. Pr.: Consent of instructor. ID-499-3-1399

Undergraduate and graduate credit in minor field

ID 500. Intermediate Interior Design Studio. (3) S. Problem solving in design of living environments using graphic communication techniques. May substitute for Interior Design Studios, ID 440, ID 540, or ID 640. Students should plan to substitute this course for the next level studio in sequence. Pr.: ID 340. ID-500-1-1399

ID 540. Interior Design Studio IV. (3) I. Analysis, organization, and development of multifunctional interior spaces within living environments. Establishment of design priorities evolving from data gathering and problem solving techniques. Six hours studio a week. Pr.: ID 440; and ID 650 or conc. enrollment. ID-540-1-1399

Undergraduate and graduate credit

ID 600. Interior Design Field Experience. (4) Supervised work experience. Pr.: Senior standing, 2.2 cumulative GPA and 2.5 GPA in professional area, and consent of department head. ID-600-2-1399

ID 640. Interior Design Studio V. (3) II. A study of human needs encountered in the total design of residential interiors; field measurements, shop drawings, supportive business procedures. Six hours studio a week. Pr.: ID 440. ID-640-1-1399

ID 650. Contemporary Homes. (3) I. Residential interior living environments explored in an ecological, behavioral, and cultural context. Pr.: ID 340. ID-650-0-1399

ID 680. Historic Fabric Design. (3) I. Interrelationships of fabric design and social, cultural, political, economic, and geographical environments from prehistoric times to present. Pr.: HIST 501 or 101; and CT 260. ID-680-0-1399

ID 751. Designing for Exceptional Needs. (3) II. Problems encountered in designing interiors for children, handicapped, aged, and the confined. Pr.: ID 440. ID-751-0-1399

ID 760. Historic Preservation and Restoration of Interiors. (3) I. Principles, guidelines, and qualities of preservation and restoration of interiors. Research and application. Pr.: ID 320 and 360; or CT 630 and 631; or PDP 250 and 251. ID-760-0-1399

ID 780. Interior Design Seminar. (2-3) I, II, alternate S. Analysis of current developments in the field. May be taken more than one semester with a maximum of 6 credit hours. Pr.: Eight hours of credit basic to field and consent of instructor. ID-780-0-1399

ID 782. Problems in Interior Design. (Var.) I, II, S. Problems planned with the student to meet particular needs. Pr.: Consent of instructor. ID-782-3-1399

Graduate credit

ID 800. Interior Design Studio VI. (3) I, II, S. Advanced studio experiences in residential interior environments. May be repeated with a maximum of 6 hours applied toward a graduate degree. Pr.: ID 540 or 640; and ID 751 or conc. enrollment, or ID 760 or conc. enrollment. ID-800-1-1399

ID 820. Readings in Interior Design. (2) I, II, S. Directed study in current problems of interior design. Pr.: ID 440. ID-820-3-1399

ID 899. Research in Interior Design. (Var.) I, II. Research which may form the basis for the master's thesis. Pr.: Graduate standing. ID-899-4-1399

Foods and Nutrition

Jane Raymond Bowers,* Head

Professors Bowers,* Reeves,* Setser,* and Zayas;* Associate Professors Chambers,* Clarke, Grunewald,* Harbers,* Holcomb,* Penner,* and Smith;* Assistant Professor Aramouni, Buonopane, and Stroh; Instructor Dray; Emeriti: Professors Caul,* Fryer,* Newell,* and Tinklin;* Associate Professor Atkinson.

The programs in the Department of Foods and Nutrition focus on the physical, chemical, nutritional, and sensory properties of food; on the metabolism of nutrients; on nutrient requirements throughout the life span; and on issues related to diet and health.

Undergraduate study

The Department of Foods and Nutrition offers three programs leading to a bachelor of science degree in foods and nutrition: community health and nutrition, food science, and nutrition sciences.

A dual-degree program in nutrition and exercise sciences is offered jointly with the Department of Physical Education and Leisure Studies. Students earn a B.S. in foods and nutrition and a B.S. from the College of Arts and Sciences.

Students in all programs gain valuable experience by completing field experiences with community and governmental agencies, and the food industries and businesses. Students may also meet the academic requirements for membership in the American Dietetic Association (ADA).

Graduate study

The department offers the master of science and Ph.D. degrees. Graduates work in industry as sensory scientists, directors of food product development and sensory evaluation, senior food scientists, managers of quality assurance and test kitchens, directors of consumer services, and technical representatives; in hospitals and community organizations as dietitians or nutrition consultants; in universities and colleges as teachers and researchers; and in government agencies as extension specialists, nutritionists, and nutrition education coordinators.

Research facilities include two sensory evaluation laboratories, human metabolic suite, a nutrition research animal laboratory accredited by the AAALAC (American Association for Accreditation for Laboratory Animal Care), and several well-equipped food and chemical laboratories.

Fellowships as well as research and teaching assistantships are available to qualified students.

Undergraduate programs Community health and nutrition

Bachelor of science in foods and nutrition

Students in community health and nutrition are prepared to develop and implement nutrition and health programs through health agencies at the federal, state, and local levels. Nutritionists identify the physiological, cultural, social, economic, and environmental causes of malnutrition; determine which groups within the community (e.g., pregnant women, infants, or the elderly) have nutrition-related problems; develop community programs to promote good health; and educate community members about nutritional practices. Students fulfill minimum academic requirements for membership in The American Dietetic Association.

General education courses (59-62 hours)

| | | |
|---------------------|---|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| PSYCH 110 | General Psychology | 3 |
| ECON 110 | Economics I | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| PHILO 130 | Introduction to Ethics | 3 |
| Humanities elective | | 3 |
| BIOCH 201 | Elementary Biochemistry | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 455 | General Microbiology | 4 |
| | or | |
| HRIMD 650 | Fundamentals of Public Health/ Food Safety | 3 |
| BIOL 240 | Human Body | 6 |
| CHM 110 | General Chemistry | 5 |
| CHM 190 | Elementary Organic Chemistry | 3 |
| CHM 191 | Elementary Organic Chemistry Lab | 2 |
| MATH 100 | College Algebra | 3 |
| | or | |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| STAT 330 | Elementary Statistics for Social Science | 3 |
| | or | |
| STAT 340 | Biometrics I | 3 |
| CIS 110 | Introduction to Personal Computers | 3 |
| | or | |
| HDFS 120 | Microcomputers in Human Services | 3 |
| PE 101 | Principles of Physical Fitness | 1 |
| | | |
| | Professional courses (42 hours) | |
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 301 | Food Trends, Legislation, and Regulation | 3 |
| FN 352 | Concepts of Personal Health | 3 |
| FN 501 | Food Science | 3 |
| FN 502 | Principles of Nutrition | 3 |
| FN 610 | Nutrition Throughout the Life Cycle | 3 |
| FN 630 | Clinical Nutrition | 4 |
| FN 660 | Nutrition and Food Behavior | 3 |
| FN 655 | Community Health Programs | 3 |
| FN 680 | Seminar in Foods and Nutrition | 2 |
| FN 700 | Community Nutrition | 3 |
| FN 706 | Practicum in Community Nutrition | 3 |
| HRIMD 440 | Fundamentals of Quantity Food Production | 5 |

Supporting courses (14 hours)

| | | |
|---|--|-------------|
| HDFS 110 | Introduction to Human Development | 3 |
| HDFS 400 | Family Economics | 3 |
| MANGT 420 | Management Concepts | 3 |
| HRIMD 445 | Organization and Management of Food Service Operations | 3 |
| HRIMD 482 | Employee Development for the Hospitality Industry | 2 |
| Unrestricted electives | | 7-10 |
| Total hours for graduation | | 125 |

Food science**Bachelor of science in foods and nutrition**

Food scientists are concerned with all aspects of the food industry, from processing the raw material to consumer acceptance of the finished product. Food scientists provide an ever increasing variety of foods to meet high standards of safety, sanitation, and quality. Students in this program may emphasize consumer communications, nutrition, or sensory analysis. Positions are available in food marketing, technical sales, quality control, sensory analysis, product development, food styling, consumer education, advertising copywriting, or managing food operations in retail companies.

General education courses (59-70 hours)

| | | |
|---------------------------|--------------------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| or | | |
| SPCH 106 | Public Speaking I | 3 |
| ECON 110 | Economics I | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| Humanities elective | | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 455 | General Microbiology | 4 |
| ASI 607 | Food Microbiology | 4 |
| MATH 110 | College Algebra | 3 |
| MATH 210 | Technical Calculus I | 3 |
| or | | |
| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
| STAT 320 | Elements of Statistics | 3 |
| or | | |
| STAT 330 | Biometrics | 3 |
| PE 101 | Principles of Physical Fitness | 1 |

Choose one of the following areas of emphasis:

| | | |
|---|--|---|
| 1. Consumer communications area (17 hours) | | |
| CHM 110 | General Chemistry | 5 |
| CHM 190 | Elementary Organic Chemistry | 3 |
| CHM 191 | Elementary Organic Chemistry Lab | 2 |
| BIOCH 201 | Elementary Biochemistry | 3 |
| PHYS 115 | Descriptive Physics | 4 |

2. Technical area (26 hours)

| | | |
|-----------|-------------------------------------|---|
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 271 | Chemical Analysis | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Lab | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Lab | 2 |
| PHYS 113 | General Physics I | 4 |

Professional courses for both areas (27 hours)

| | | |
|---------|--|---|
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 301 | Food Trends, Legislation, and Regulation | 3 |
| FN 501 | Food Science | 3 |
| FN 502 | Principles of Nutrition | 3 |
| FN 680 | Seminar in Foods and Nutrition | 2 |
| FN 790 | Food Research Techniques | 3 |
| ASI 305 | Fundamentals of Food Processing .. | 3 |

Six hours from foods processing electives:

| | | |
|----------|---|---|
| ASI 361 | Meat Processing | 2 |
| ASI 502 | Principles of Dairy Food Processing | 3 |
| ASI 671 | Meat Selection and Utilization .. | 3 |
| ASI 695 | Quality Assurance | 3 |
| GRSC 651 | Food and Feed Plant Sanitation .. | 4 |
| ET 640 | Food Processing Operations | 5 |
| GRSC 100 | Principles of Milling | 3 |
| GRSC 625 | Flour and Dough Testing | 3 |
| GRSC 635 | Baking Science I | 2 |
| GRSC 636 | Baking Science I Lab | 2 |

Students emphasizing consumer communications area are required to take:

1. Consumer communications area (26 hours)

| | | |
|-------------------|---|---|
| FN 612 | Principles of Food Product Development | 3 |
| FN 616 | Principles of Food Demonstration .. | 3 |
| EDCI 318 | Instructional Media and Technology | 2 |
| ENGL 516 | Written Communications for the Sciences | 3 |
| or | | |
| JMC 250 | Agricultural Journalism | 3 |
| JMC 320 | Principles of Advertising | 3 |
| JMC 512 | Public Relations | 3 |
| MKTG 400 | Marketing | 3 |
| MKTG 450 | Consumer Behavior | 3 |
| FN elective | | 3 |

Students emphasizing technical area are required to take:

2. Technical area (19 hours)

| | | |
|--|---|---|
| ET 400 | Introduction to Food Engineering Technology | 4 |
| Take 15 additional hours (including 9 hours FN) from sensory analysis and nutrition-related courses listed below, from food processing electives, or from consumer communications area | | |
| 15 | | |

Sensory analysis

| | | |
|-----------|--|---|
| FN 612 | Principles of Food Product Development | 3 |
| FN 721 | Sensory Analysis of Foods | 3 |
| FN 760 | Fundamentals of Food Flavor Analysis | 3 |
| PSYCH 480 | Fundamentals of Perception and Sensation | 3 |
| or | | |
| PSYCH 570 | Psychobiology | 3 |
| STAT 703 | Statistics for Natural Scientists | 3 |

Nutrition

| | | |
|----------|--|---|
| BIOL 240 | Structure and Function of the Human Body | 6 |
| FN 610 | Nutrition Throughout the Life Cycle | 3 |

Supporting courses (6 hours)

| | | |
|------------------------------|-------------------------------|---|
| FEC 650 | Consumer Product Safety | 3 |
| HDFS or HRIMD elective | | 3 |

Unrestricted electives 5-9

Total hours for graduation 127

The food science program involves the Colleges of Human Ecology and Agriculture. In addition to the consumer communications and technical areas offered by the College of Human Ecology, students may select business, processing or science options through the College of Agriculture. See Food Science and Industry in the College of Agriculture section of this catalog.

Nutritional sciences (pre-medicine)**Bachelor of science in foods and nutrition**

The nutritional sciences program emphasizes the biological and physical sciences and provides students with the background necessary to understand the function and metabolism of nutrients. The program provides an excellent foundation for students considering careers in medicine, dentistry, and other health science profes-

sions. Academic requirements for entering medical school are met through this degree.

General education courses (51-53 hours)

| | | |
|------------------|--------------------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| or | | |
| SPCH 106 | Public Speaking I | 3 |
| PSYCH 110 | General Psychology | 3 |
| ECON 110 | Economics I | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| Humanities | | 3 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Human Body | 6 |
| BIOL 455 | General Microbiology | 4 |
| MATH 150 | Trigonometry* | 3 |
| MATH 220 | Analytic Geometry and Calculus I .. | 4 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| PE 101 | Principles of Physical Fitness | 1 |

*If taken in high school, substitute computer science, statistics, or higher mathematic course (3-4 hours)

Professional courses (31 hours)

| | | |
|--------|--|---|
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 301 | Food Trends, Legislation, and Regulation | 3 |
| FN 501 | Food Science | 3 |
| FN 502 | Principles of Nutrition | 3 |
| FN 610 | Nutrition Throughout the Life Cycle | 3 |
| FN 680 | Seminar in Foods and Nutrition | 2 |
| FN 700 | Community Nutrition | 3 |
| FN 710 | Bionutrition | 3 |
| FN 630 | Clinical Nutrition | 4 |
| FN | Foods and nutrition elective | 3 |

Supporting courses (31 hours)

| | | |
|-----------|---|---|
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 271 | Chemical Analysis | 4 |
| CHM 531 | Organic Chemistry I | 3 |
| CHM 532 | Organic Chemistry Lab | 2 |
| CHM 550 | Organic Chemistry II | 3 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Lab | 2 |
| HDFS 110 | Introduction to Human Development | 3 |
| or | | |
| FN 352 | Concepts of Personal Health | 3 |
| HDFS 400 | Family Economics | 3 |
| or | | |
| FEC 650 | Consumer Product Safety | 3 |

Unrestricted electives 11-13

Total hours for graduation 125

Nutrition and exercise sciences

Bachelor of science in foods and nutrition
Bachelor of science, physical education major, exercise science option

Nutrition and exercise sciences is a dual-degree program. Students complete a total of 150 credit hours and earn two degrees, one from the Department of Foods and Nutrition and the second from the Department of Physical Education and Leisure Studies. Graduates of this program may pursue careers in health programs offered by hospitals, industries, wellness centers, public and private clinics, fitness camps, and athletic clubs.

In addition, students in this program can fulfill the minimum academic requirements for membership in The American Dietetic Association (ADA) by including three specified requirements in their course work.

Those interested in becoming registered dietitians (R.D.) can do so by completing an additional experience requirement and passing a national examination. Students who would like to meet these requirements should consult their advisor.

General education and supporting courses (68–74 hours)

| | | |
|-----------|---------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| PSYCH 110 | General Psychology | 3 |
| ECON 110 | Economics I | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |

Additional courses as specified in the General Requirements Section for Arts and Sciences

Humanities 11-12
(One course each in fine arts, philosophy, western heritage, and literary or rhetorical arts.)

Additional social science course (1 course) 3
International studies overlay (1 course) 0-3

| | | |
|-----------|---|---|
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Human Body | 6 |
| BIOL 455 | General Microbiology | 4 |
| CHM 110 | General Chemistry | 5 |
| CHM 190 | Elementary Organic Chemistry | 3 |
| CHM 191 | Elementary Organic Chemistry Laboratory | 2 |
| BIOCH 201 | Elementary Biochemistry | 3 |
| PHYS 115 | Descriptive Physics | 4 |
| MATH 100 | College Algebra | 3 |
| | or | |
| MATH 220 | Analytic Geometry and Calculus I | 4 |
| STAT 320 | Elements of Statistics | 3 |
| | or | |
| STAT 330 | Elementary Statistics for the Social Sciences | 3 |

Nutrition science (36–39 hours)

| | | |
|-----------|---|-----|
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 301 | Food Trends, Legislation, and Regulation | 3 |
| FN 352 | Concepts of Personal Health | 3 |
| FN 501 | Food Science | 3 |
| FN 502 | Principles of Nutrition | 3 |
| FN 610 | Nutrition Throughout the Life Cycle | 3 |
| FN 630 | Clinical Nutrition | 4 |
| FN 635 | Nutrition and Exercise (if not taken as PE 635 below) | 0-3 |
| FN 680 | Seminar in Foods and Nutrition | 2 |
| FN 700 | Community Nutrition | 3 |
| FN 706 | Practicum in Community Nutrition | 3 |
| HRIMD 440 | Fundamentals of Quantity Food Production | 5 |

Exercise science (30–33 hours)

| | | |
|--------|---|-----|
| PE 101 | Principles of Physical Fitness | 1 |
| PE 206 | Professional Orientation | 1 |
| PE 320 | Motor Development and Learning | 3 |
| PE 325 | History and Philosophy of Physical Education | 3 |
| PE 330 | Kinesiology | 3 |
| PE 335 | Physiology of Exercise | 3 |
| PE 340 | Social-Psychological Dimensions of Physical Activity | 3 |
| PE 376 | First Aid and CPR | 1 |
| PE 561 | Adapted Physical Education | 3 |
| PE 635 | Nutrition and Exercise (if not taken as FN 635 above) | 0-3 |
| PE 710 | Measurement and Evaluation of Physical Education | 3 |
| PE 755 | Adult Exercise Programs | 3 |
| PE 759 | Exercise Testing and Prescription | 3 |

Unrestricted electives 7-13

Total hours for graduation 150

Courses in foods and nutrition

Undergraduate credit

FN 132. Basic Nutrition. (3) I, II, S. Fundamentals of human nutrition as they relate to health and well-being of individuals. Nutritional requirements over the life span. Not open to students in foods and nutrition, dietetics and institutional management, home economics education, or home economics extension. FN-132-0-1306

FN 300. Food Preparation and Meal Management. (4) I. Principles of food preparation; selection and evaluation of food products; meal service with emphasis on nutritional adequacy, aesthetics, and management of resources. Two hours rec. and six hours lab a week. FN-300-1-1306

FN 301. Food Trends, Legislation, and Regulation. (3) II. Food laws, regulation, labeling, additives, and residues. Current trends in market forms, packaging, and utilization of various foods. Pr.: ECON 110. FN-301-0-1306

FN 352. Concepts of Personal Health. (3) I, II. Current health issues in various developmental stages of the individual. Factors conducive to maintaining health of family members from the prenatal period through old age. Pr.: Sophomore standing. FN-352-0-1306

FN 499. Problem in Foods and Nutrition. (Var.) I, II, S. Supervised individual project to study current topics or participation in research in foods and nutrition. Pr.: Six hours in FN and consent of instructor. FN-499-3-1306

Undergraduate and graduate credit in minor field

FN 501. Food Science. (3) I, II. Basic scientific principles of preparation of foods as related to their chemical and physical properties. Two hours rec. and three hours lab a week. Pr.: CHM 190 and 191, or 350 and 351, or 531 and 532; and FN 300. FN-501-1-1306

FN 502. Principles of Nutrition. (3) I, II. Functions and interrelationships of various nutrients in the body. Two hours rec. and three hours lab a week. Pr.: CHM 190 and 191, or 350 and 351, or 531 and 532; and BIOL 198. FN-502-1-1306

FN 503. Maternal and Child Nutrition. (2-3) II. A study of the principles of prenatal, infant, and child nutrition emphasizing the practical application to life situations. Pr.: FN 132 and BIOL 198. FN-503-0-1306

FN 511. Nutrition and Health for Elementary/Middle Level Teachers. (4) I. Strategies and resources for use by classroom teachers to promote better nutrition and health behaviors in elementary and middle level students. Pr.: FN 132 and 352. FN-511-0-1306

FN 520. Topics in Foods and Nutrition. (1-3) On sufficient demand. May be taken more than once for a maximum of 6 hours. Pr.: Junior standing and consent of instructor. FN-520-0-1306

Undergraduate and graduate credit

FN 600. Practicum in Foods and Nutrition. (3-5) I, II, S. Supervised professional field experience in foods and nutrition. Graduate students may enroll for a maximum of 3 credits. Pr.: FN 501, 502, and consent of instructor. FN-600-2-1306

FN 610. Nutrition Throughout the Life Cycle. (3) I. Food patterns, dietary intakes, and nutritional requirements of infants, children, adolescents, and adults. Pr.: BIOCH 201 or 521; BIOL 240 or 526 or AP 530; and FN 502. FN-610-0-1306

FN 612. Principles of Food Product Development and Control. (3) II. Food product concept, feasibility, and evaluation. Pr.: FN 501. FN-612-0-1306

FN 616. Principles of Food Demonstration. (3) II. Fundamentals in food demonstrations used by the teacher, home economics agent, and commercial demonstrator. Six hours lab a week. Pr.: FN 132 or 502; and FN 501. FN-616-1-1306

FN 630. Clinical Nutrition. (4) II. Nutrition in disease including physiological and biochemical basis of nutrition care, effects of disease on nutrient metabolism, diet therapy, nutrition assessment and nutrition counseling. Pr.: FN 502; BIOCH 201 or 521; and BIOL 240 or AP 530 or BIOL 526. FN-630-0-1306

FN 635. Nutrition and Exercise. (3) II. The interrelationships among diet, nutrition, and exercise. Topics covered include physical fitness, weight control, nutrient metabolism during exercise, and athletic performance. Pr.: FN 132 or 502; and PE 335. Cross-listed with College of Arts and Sciences; see PE 635. FN-635-0-1306

FN 655. Community Health Programs. (3) II. Analysis of local, state, and national health problems including infectious diseases, accidents, chronic illnesses, and occupational/environmental hazards, with emphasis on the programs designed to address these concerns. Pr.: FN 352 and BIOL 198. FN-655-0-1306

FN 660. Nutrition and Food Behavior. (3) I, in even years. Focus on the physiological, environmental, cultural, and economic factors that influence the use of food. Identification of appropriate methodology to study these factors as well as programs to modify food behavior. Pr.: PSYCH 110 or SOCIO 211 or ANTH 200; and FN 502. FN-660-0-1306

FN 680. Seminar in Foods and Nutrition. (2) I. Individual reports and discussion of current topics in foods and nutrition. Pr.: FN 501 and 502. FN-680-0-1306

FN 700. Community Nutrition. (3) I. Factors in the community influencing nutritional status, techniques to assess community nutritional needs, methodology for implementing and evaluating community nutrition programs. Pr.: FN 503 or 610. FN-700-0-1306

FN 702. Nutrition in Developing Countries. (3) I, in odd years. Nutritional problems in developing countries, including an analysis of factors which contribute to malnutrition, effects of undernutrition, methods for assessing nutritional status, and interventions to combat nutrition problems. Pr.: FN 503 or 610. FN-702-0-1306

FN 706. Practicum in Community Nutrition. (3) I, II, S. Supervised experience in community nutrition agencies. Pr.: FN 700 and consent of instructor. FN-706-2-1306

FN 710. Bionutrition. (3) II. Nutrient interrelationships based on knowledge of biochemical and physiological processes, functions of specific nutrients, and evaluation of nutritional status. Pr.: BIOCH 521, BIOL 526, and FN 502. FN-710-0-1306

FN 718. Physical Health and Aging. (3) Focus is on the physiological theories of aging, the relationship between normal aging processes, and the major chronic and acute diseases of the elderly, and community health promotion/maintenance programs for older adults. Pr.: BIOL 198 or 310; HDFS 510. FN-718-0-1306

FN 720. Food Systems. (3) II. Chemical and physical principles of food components; emulsions and colloidal food systems. Two hours lec. and three hours lab a week. Pr.: BIOCH 521 and FN 501. FN-720-0-1306

FN 721. Sensory Analysis of Foods. (3) II. Sensory analysis of food appearance, texture, aroma, flavor; physiology of sensory receptors; application of laboratory and consumer panels; and interpretation of data. Two hours rec. and two hours lab a week. Pr.: FN 501. FN-721-1-1306

FN 750. Nutritional Aspects of Food Processing and Preparation. (2-3) I. In alternate years. Stability of nutrients during processing, storage, and preparation of foods from raw food to products for human consumption. Pr.: FN 501; FN 502; and BIOCH 200 or 521. FN-750-0-1306

FN 760. Fundamentals of Food Flavor Analysis. (3) I. In alternate years. Flavor perception considered from both the human senses of taste, feeling, and smell and the chemical and physical attributes of food; practical bases for reliable sensory measurement. One hour lec. and six hours lab a week. Pr.: CHM 190 or 350 or 550; and FN 501. FN-760-1-1306

FN 780. Problems in Foods and Nutrition. (Var.) I, II, S. Laboratory and library experience in current problems in foods and nutrition. Three hours lab a week for each hour of credit. Pr.: FN 501 or 502. FN-780-3-1306

FN 782. Topics in Foods and Nutrition. (1-3) On sufficient demand. May be taken more than once for a maximum of 6 hours. Pr.: Senior standing and consent of instructor. FN-782-0-1306

FN 790. Food Research Techniques. (3) I. Fundamental principles of food quality evaluation and development of an independent research problem. Pr.: FN 501. FN-790-1-1306

Graduate credit

FN 811. Advances in Foods. (1-3) S. Recent developments and concerns related to foods. Pr.: FN 501 and consent of instructor. FN-811-0-1306

FN 813. Advances in Nutrition. (1-3) S. Recent developments and concerns related to nutrition. Pr.: FN 502 and consent of instructor. FN-813-0-1306

FN 816. Application of Food Flavor Analysis. (2) II. On sufficient demand. Application of flavor panel analysis to food research problems. One hour lec. and two hours lab a week. Pr.: FN 760. FN-816-1-1306

FN 817. Nutrition and Aging. (2-3) S. Nature of aging process, nutritional requirements, food habits, and effect of nutrition on the rate of biological aging. Pr.: Six hours of nutrition, BIOL 240 or 526, or AP 530; and BIOCH 521. FN-817-0-1306

FN 818. Fundamentals of Meat Processing and Preparation. (1-2) S. On sufficient demand. Inspection, grading, processing, and preparation in relation to chemical and physical characteristics, costs, safety, quality, and palatability of red meat. Pr.: FN 501 and conc. enrollment in ASI 818. FN-818-1-1306

FN 880. Graduate Seminar in Foods and Nutrition. (1) II. Discussion of investigations in foods and nutrition. May be taken four semesters for credit. Pr.: FN 790 and 610. FN-880-0-1306

FN 898. Master's Report. (Var.) I, II, S. Survey in depth of the literature. FN-898-4-1306

FN 899. Master's Thesis. (Var.) I, II, S. Research in area of specialization. FN-899-4-1306

FN 905. Lipids in Food Systems. (2) S. In alternate years. Physical and chemical characteristics of lipids with emphasis on their behavior and function in food systems. Pr.: BIOCH 521 and FN 720. FN-905-0-1306

FN 906. Proteins in Food Systems. (2) S. In alternate years. Behavior and function of plant, animal, and nonconventional proteins in food systems. Pr.: BIOCH 521 and FN 720. FN-906-0-1306

FN 907. Food Dispersions. (2) I. In alternate years. Properties of food dispersions: food sols, food gels, emulsions, and foams including hatters and doughs. Pr.: FN 720. FN-907-0-1306

FN 908. Carbohydrates in Food Systems. (2) I. In alternate years. Properties and functions of sugars and starches, and characteristics of edible plant tissues and pigments. Pr.: FN 720. FN-908-0-1306

FN 910. Advanced Nutrition: Carbohydrates and Lipids. (2) II. In alternate years. Nutritional roles and metabolism of carbohydrates and lipids in normal and abnormal physiological states. Pr.: BIOCH 521, BIOL 526, and FN 710. FN-910-0-1306

FN 911. Advanced Nutrition: Proteins and Amino Acids. (2) I. In alternate years. Nutritional roles and metabolism of proteins and amino acids. Functions, protein quality assessment, digestion and absorption, hormonal regulation, requirements, and interrelationships with other nutrients. Pr.: BIOCH 521, BIOL 526, and FN 710. FN-911-0-1306

FN 912. Advanced Nutrition: Minerals. (2) I. In alternate years. Nutritional roles and metabolism of minerals. Functions, biological availability, hormonal regulation, requirements, deficiency and toxicity signs, and interrelations with other nutrients. Pr.: BIOCH 521, BIOL 526, and FN 710. FN-912-0-1306

FN 913. Advanced Nutrition: Vitamins. (2) II. In alternate years. Nutritional roles and metabolism of vitamins. Functions, requirements, antivitamins, and deficiency and toxicity signs. Pr.: BIOCH 521, BIOL 526, and FN 710. FN-913-0-1306

FN 981. Food Science Colloquium. (1) I. Discussion of investigations in food science. Attendance required of all graduate students in food science. Maximum of 2 hours may be applied toward an M.S. degree or 4 hours toward a Ph.D. degree. FN-981-0-1306

FN 999. Research in Foods and Nutrition. (Var.) I, II, S. Three hours a week for each hour of credit. Pr.: Consent of instructor. FN-999-4-1306

General Human Ecology

Professors Moxley and Stowe; Instructors DeYoung, Pence, and Segó.

General human ecology programs prepare students for careers in education, extension, and communication that require an understanding of human needs, environments, and relationships.

Graduate programs

The graduate program for the Ph.D. in human ecology includes specializations in: textiles and apparel, marriage and family therapy, family life education and consultation, life span human development, and institution management.

General human ecology

Bachelor of science in human ecology

Degree programs in general human ecology allow students to integrate knowledge from apparel and textiles, interior design, housing, human development, family studies, family economics, and foods and nutrition. For students with interests in human ecology who wish to defer the selection of a major, programs of study in general human ecology afford the greatest flexibility in course selection.

General education (41-44 hours)

| | | |
|-----------|-----------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| ECON 110 | Economics I | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| | Humanities elective minimum | 6 |
| BIOL 198 | Principles of Biology | 4 |
| CHM 110 | General Chemistry | 5 |
| | or | |
| PHYS 101 | The Physical World I | 3 |
| | and | |
| PHYS 103 | The Physical World I Lab | 1 |
| MATH 100 | College Algebra | 3 |

| | | |
|---|---|-----|
| STAT 320 | Elements of Statistics | |
| | or | |
| STAT 330 | Elements of Statistics for Social Sciences | 3 |
| | or | |
| STAT 350 | Business and Economics Statistics | 3 |
| CIS | Computer science elective | 3-4 |
| PE 101 | Principles of Physical Fitness | 1 |
| Human ecology courses (51 hours) | | |
| CT 330 | Clothing and Society | 3 |
| FEC 400 | Family Economics | 3 |
| FEC 105 | Introduction to Personal and Family Finance | 3 |
| | or | |
| FEC 460 | Family Resource Management | 3 |
| FEC 420 | Housing | 3 |
| FN 132 | Basic Nutrition | 3 |
| | or | |
| FN 502 | Principles of Nutrition | 3 |
| HDFS 230 | Introduction to Human Development | 3 |
| HDFS 350 | Family Relations and Sex Roles | 3 |
| HDFS 510 | Human Development and Aging | 3 |
| ID 101 | Design for Contemporary Living | 3 |

Human ecology electives (24 hours)
Select in consultation with advisor.

Twelve hours from the following:

| | | |
|----------|---|---|
| CT 150 | Principles of Clothing Construction | 3 |
| CT 220 | Fundamentals of Apparel Design and Production | 3 |
| CT 230 | Apparel and Textile Marketing | 3 |
| CT 260 | Textiles | 3 |
| FN 301 | Food Trends, Legislation, and Regulation | 3 |
| FN 352 | Concepts of Personal Health | 3 |
| HDFS 235 | Infants and Toddlers | 3 |
| HDFS 301 | Helping Relationship | 3 |
| ID 240 | Interior Design Studio I | 3 |

Choose 12 hours human ecology electives, 300 level or higher.

Supporting courses (15 hours)

In consultation with advisor choose 15 hours, 300-level or higher, in areas other than human ecology.

Unrestricted electives 16-19

Total for graduation 126

Human ecology and mass communications

Bachelor of science in human ecology and mass communications

In this program students select areas of concentration in human ecology and mass communications according to their individual needs and interests. In human ecology they specialize in clothing, textiles, and interior design; foods and nutrition; hotel, restaurant, institution management and dietetics; or human development and family studies. In mass communications they choose advertising, journalism, public relations, radio-TV, or a general program.

General education (37-38 hours)

| | | |
|-----------------------|-----------------------------------|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| ECON 110 | Economics I | 3 |
| Two of the following: | | |
| HDFS 110 | Introduction to Human Development | 3 |
| PSYCH 110 | General Psychology | 3 |

| | | |
|--|---------------------------|---|
| SOCIO 211 | Introduction to Sociology | 3 |
| Humanities electives* | | 6 |
| MATH 100 | College Algebra | 3 |
| or | | |
| A college-level calculus course | | 3 |
| Any 3-hour introductory statistics course | | 3 |
| or | | |
| Any 3-hour computing literacy course | | 3 |
| Biological sciences and physical sciences | | 7 |
| (One course must be taken from each area; one course must include a laboratory.) | | |

PE 101 Principles of Physical Fitness 1

*Two-hour courses are not acceptable in humanities.

Professional courses (45–54 hours)

Human ecology courses 15–18
Area of concentration in: CTID, HRIMD, HDFS, or FN

Journalism and mass communications courses (30–36 hours)

In consultation with your advisor, select one of the options listed below:

1. Journalism

| | | |
|---------|------------------------------------|---|
| JMC 235 | Introduction to Mass Communication | 3 |
| JMC 275 | News and Feature Writing | 3 |
| JMC 600 | Public Affairs Reporting | 3 |
| JMC 665 | Law of Mass Communications | 3 |
| JMC 300 | Editing and Design | 3 |
| JMC 380 | Advanced News and Feature Writing | 3 |
| JMC 480 | Advanced Editing and Design | 3 |
| JMC 240 | Audio I | 3 |
| JMC 330 | Broadcast News Writing | 3 |
| JMC 320 | RTV Performance | 3 |

Electives in journalism and mass communications** 9–14

2. General

| | | |
|--|--|---|
| JMC 235 | Introduction to Mass Communication | 3 |
| JMC 275 | News and Feature Writing | 3 |
| JMC 300 | Editing and Design | 3 |
| JMC 320 | Principles of Advertising | 3 |
| JMC 380 | Advanced News and Feature Writing | 3 |
| JMC 660 | History of Journalism | 3 |
| JMC 685 | The Mass Communicator: Ethics and Issues | 3 |
| JMC 665 | Law of Mass Communications | 3 |
| Electives in journalism and mass communications** 9–14 | | |

3. Advertising

| | | |
|--|------------------------------------|---|
| JMC 235 | Introduction to Mass Communication | 3 |
| JMC 275 | News and Feature Writing | 3 |
| JMC 320 | Principles of Advertising | 3 |
| JMC 545 | Advertising Media | 3 |
| JMC 555 | Ad Copy and Layout | 3 |
| JMC 620 | Electronic Media Advertising | 3 |
| JMC 640 | Seminar in Advertising Management | 3 |
| JMC 665 | Law of Mass Communications | 3 |
| Electives in journalism and mass communications** 6–11 | | |

4. Public Relations

| | | |
|---------|------------------------------------|---|
| JMC 235 | Introduction to Mass Communication | 3 |
| JMC 275 | News and Feature Writing | 3 |
| JMC 300 | Editing and Design | 3 |

| | | |
|---------|-----------------------------------|-----|
| JMC 380 | Advanced News and Feature Writing | 3 |
| JMC 515 | Fundamentals of Public Relations | 3 |
| JMC 635 | Public Relations Techniques | 3 |
| JMC 642 | Public Relations Campaigns | 3 |
| JMC 665 | Law of Mass Communications | 3 |
| JMC 550 | Mass Communications Internship | 1–3 |

Electives in journalism and mass communications** 5–10

5. Radio-TV

| | | |
|---------|------------------------------------|---|
| JMC 235 | Introduction to Mass Communication | 3 |
| RTV 237 | Writing for Electronic Media | 3 |
| JMC 275 | News and Feature Writing | 3 |
| RTV 240 | Audio I | 3 |
| RTV 250 | Video I | 3 |
| RTV 490 | Senior Seminar | 3 |

At least one of the following theory courses:

| | | |
|---------|---|---|
| JMC 530 | The Ethnic Media in America | 3 |
| JMC 560 | Non-Traditional Press | 3 |
| JMC 612 | Women and the Media | 3 |
| JMC 660 | History of Journalism | 3 |
| RTV 660 | History of Telecommunications | 3 |
| RTV 665 | Radio-Television Rules and Responsibility | 3 |
| JMC 670 | International Communications | 3 |
| JMC 685 | The Mass Communicator: Ethics and Issues | 3 |
| JMC 730 | Seminar in the Future of the Media | 3 |
| JMC 740 | Colloquium in Mass Communications | 3 |

At least one of the following:

| | | |
|---------|------------------------------|---|
| RTV 330 | Broadcast News Writing | 3 |
| RTV 620 | Electronic Media Advertising | 3 |
| RTV 685 | Electronic Media Management | 3 |

Electives in journalism and mass communications** 6–11

**The human ecology and mass communications degree requires a minimum of 90 credit hours outside the Department of Journalism and Mass Communications and a minimum of 30 credit hours within that department.

Supporting courses (26 hours)

Selected in consultation with faculty advisor.

| | | |
|-------------------------------------|--|---|
| Human ecology courses (18 hours) | | |
| CT 150 | Principles of Clothing Construction* | 3 |
| CT 260 | Textiles | 3 |
| HDFS 105 | Introduction to Personal and Family Finance | 3 |
| FEC 420 | Housing | 3 |
| FEC 440 | Home Appliance Design and Evaluation | 3 |
| HDFS 460 | Family Resource Management, Theory and Application | 3 |
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 502 | Principles of Nutrition | 3 |
| HDFS 310 | Early Childhood | 3 |
| HDFS 313 | Preschool Child Lab | 1 |
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| HDFS 370 | Parenting | 3 |
| HDFS 302 | You and Your Sexuality | 3 |
| FN 501 | Food Science | 3 |
| FN 352 | Concepts of Personal Health | 3 |
| HDFS 400 | Family Economics | 3 |
| HDFS 506 | Middle Childhood and Adolescence | 2 |
| HDFS 508 | Adolescent Lab | 1 |
| Political science electives 6 | | |
| Business administration electives 6 | | |

Unrestricted electives 7–17

Total for graduation 125

***If not taken as a professional course.

Home economics education certification requirements

Bachelor of science in human ecology

This program provides students with the skills and knowledge necessary to deliver home economics education to diverse populations in various settings. Graduates of the program work in secondary schools, vocational education programs, cooperative extension, business, and industry.

Upon successful completion of the teacher education program and the National Teacher Examination, graduates are eligible for certification to teach home

economics in Kansas schools. See the College of Education section of this catalog for more information on eligibility requirements. Inquiries should be directed to the Center for Student and Professional Services, 13 Bluemont Hall.

General education (49–51 hours)

| | | |
|--|---|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| or | | |
| SPCH 106 | Public Speaking I | 3 |
| ECON 110 | Economics I | 3 |
| ANTH 200 | Introduction to Cultural Anthropology | 3 |
| PSYCH 110 | General Psychology | 3 |
| One course in American or world history (HIST 101, 102, 251, or 252) | | |
| ART 100 | Design I | 2 |
| Literature elective (ENGL 261, 262, 271, 272, 361, 362, 381, or 382) | | |
| Humanities elective (ENGL 230, 231, 233, or 234) | | |
| CHM 110 | General Chemistry | 5 |
| CHM 190 | Elementary Organic Chemistry | 3 |
| CHM 191 | Elementary Organic Chemistry Lab | 2 |
| or | | |
| BIOCH 120 | Introductory Organic and Biological Chemistry | 5 |
| BIOL 198 | Principles of Biology | 4 |
| MATH 100 | College Algebra | 3 |

| | | |
|----------|--------------------------------------|---|
| CIS 110 | Introduction to Personal Computing | 3 |
| or | | |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| or | | |
| CIS 206 | BASIC Language Lab | 2 |
| or | | |
| HDFS 120 | Microcomputers in Human Services | 3 |
| PE 101 | Principles of Physical Fitness | 1 |

Professional human ecology courses (41 hours)

| | | |
|----------|--|---|
| CT 150 | Principles of Clothing Construction* | 3 |
| CT 260 | Textiles | 3 |
| HDFS 105 | Introduction to Personal and Family Finance | 3 |
| FEC 420 | Housing | 3 |
| FEC 440 | Home Appliance Design and Evaluation | 3 |
| HDFS 460 | Family Resource Management, Theory and Application | 3 |
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 502 | Principles of Nutrition | 3 |
| HDFS 310 | Early Childhood | 3 |
| HDFS 313 | Preschool Child Lab | 1 |
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| HDFS 370 | Parenting | 3 |
| HDFS 302 | You and Your Sexuality | 3 |
| FN 501 | Food Science | 3 |
| or | | |
| FN 352 | Concepts of Personal Health | 3 |
| or | | |
| HDFS 400 | Family Economics | 3 |
| or | | |
| HDFS 506 | Middle Childhood and Adolescence | 2 |
| and | | |
| HDFS 508 | Adolescent Lab | 1 |

*If students quiz out of CT 150, an additional construction course is to be taken.

Professional education courses (41 hours)

| | | |
|----------|---|----|
| EDAO 321 | Exploration in Human Ecology Education | 1 |
| EDAF 215 | Education Implications of Growth and Development | 3 |
| EDAF 315 | Educational Psychology** | 3 |
| EDAF 323 | Exceptional Students in the Secondary School** | 2 |
| EDCI 326 | Core Teaching Skills and Lab** | 3 |
| EDCI 477 | Middle Level/Secondary Reading** | 2 |
| EDAO 550 | Methods of Teaching Home Economics** | 2 |
| EDCI 420 | Block II Lab** | 1 |
| EDAO 621 | Program Planning in Vocational Education** | 3 |
| EDCI 455 | Teaching in a Multicultural Society** | 1 |
| EDAF 525 | Interpersonal Relations in the School** | 1 |
| EDAO 586 | Teaching Participation in the Secondary School and Professional Development Seminar** | 12 |

**These courses are blocked in three sequential semesters; they are to be taken concurrently and are prerequisites to the subsequent designated block of courses.

| | | |
|----------|---|---|
| EDAO 620 | Principles and Philosophy of Vocational Education | 3 |
| EDCI 318 | Instructional Media and Technology | 2 |
| EDAO 610 | Occupational Home Economics | 2 |

Courses in general human ecology**Undergraduate credit**

GNHE 208. Human Ecology Colloquium. (Var.) I, II, S. Special topics for human ecology majors. GNHE-208-2-1301

GNHE 385. Problem in General Human Ecology. (Var.) I, II, S. Independent study. Pr.: Consent of instructor. GNHE-385-3-1301

GNHE 399. Honors Seminar in Human Ecology. (1) I, II. Selected topics in human ecology. May be taken more than once for credit. For students in honors program only. GNHE-399-0-1301

Undergraduate and graduate credit

GNHE 780. Problems in General Human Ecology. (Var.) I, II, S. Individual investigation into work in general human ecology. Pr.: Consent of instructor. GNHE-780-3-1301

Graduate credit

GNHE 860. Contemporary Topics in Human Ecology. (1-4) I, II, S. Selected topics in human ecology. May be taken more than once with consent of graduate committee. Pr.: Eight hours graduate-level human ecology courses. GNHE-860-2-1301

GNHE 865. Field Study in Human Ecology. (1-6) II. Supervised professional human ecology experiences. May be taken more than one semester. Pr.: GNHE 860 or consent of instructor. GNHE-865-2-1301

GNHE 880. Seminar in Human Ecology. (1-3) I, II, S. Current research and trends in human ecology. May be taken more than once for credit. Pr.: Consent of instructor. GNHE-880-0-1301

GNHE 899. Research in General Human Ecology. (Var.) I, II, S. Individual research problems. Pr.: Consent of instructor. GNHE-899-4-1301

Hotel, Restaurant, Institution Management and Dietetics

Judy Miller,* Head

Professor Miller* and Spears;* Associate Professors Canter,* Gregoire,* and Roach;* Assistant Professor Partlow; Instructors Dana, Dienhart, Freund, Hall, and MacLaurin; Emeriti: Professor Shugart;* Associate Professors Riggs and Ziegler.*

The programs in the Department of Hotel, Restaurant, Institution Management and Dietetics prepare students to enter the professions of hotel and restaurant management, foodservice management, and dietetics.

Undergraduate study

The department offers a bachelor of science degree in dietetics and a bachelor of science degree in hotel and restaurant management. Two programs, the coordinated program in dietetics and general dietetics, lead to the bachelor of science degree in dietetics.

Coordinated program in dietetics Program I

Students complete preprofessional study during the freshman and sophomore years, and apply for formal admission into the program at the end of the sophomore year. The coordinated program prepares students for the dietetic profession by integrating course work with 1,035 hours supervised practice experiences. Graduates are eligible for active membership in The American Dietetic Association (ADA) and, upon passing a national qualifying examination, for registration as a dietitian (R.D.). The program is accredited by The American Dietetic Association Council on Education, Division of Accreditation/Approval, a specialized accrediting body recognized by the Council on Postsecondary Accreditation and the United States Department of Education.

Junior and senior students gain foodservice management experience in the residence halls and K-State Union on campus. Seniors also spend one semester at the KSU Dietetic Center, located at the University of Kansas School of Medicine-Wichita, where they work in UKSM-W outpatient clinics and in area hospitals.

Application for admission to the coordinated program in dietetics should occur during the second semester of the sophomore year. Criteria for admission are:

An overall minimum grade point average of 2.5 on a 4.0 scale, with no grade lower than C in the physical and biological sciences.

A completed application form.

Two completed recommendation forms, one from a former instructor familiar with the applicant's scholastic abilities, and the other from an employer or other person well acquainted with the applicant.

An interview with the program director, to be scheduled by the applicant.

The application process should be completed by April 30 for fall semester admission, and by October 31 for spring semester admission.

Ongoing evaluation of the student's didactic and performance-based learning is an important component in the coordinated program in dietetics.

Criteria for progression to the senior year are:

An overall minimum grade point average of 2.7, with no grade lower than C in professional courses (HRIMD or FN courses).

Recommendation of the student by faculty teaching the junior-level professional courses.

General dietetics Program II

The program in general dietetics is approved by The American Dietetic Association Council on Education, Division of Accreditation/Approval as a Didactic Program in Dietetics (Plan V). Completion of the program meets the academic requirements for membership in the ADA.

Supervised practice experience, required for eligibility to take the national R.D. exam, must be obtained by the student after graduation through a dietetic internship or approved pre-professional practice program.

Hotel and restaurant management

Bachelor of science in hotel and restaurant management

The hotel and restaurant management program provides students with a broad liberal education, an understanding of business administration, a solid foundation of professional courses in both hotel and foodservice operations, and hands-on experience in the hospitality industry. A 400-hour field experience for academic credit is required.

Students apply concepts learned in the classroom to actual work situations. On-campus facilities include a quantity food production laboratory, residence halls, and the K-State Union foodservices. Students gain valuable experience in commercial properties under the supervision of managers and faculty supervisors.

Graduate study

The department offers the master of science degree in institution management. Students may focus their study on either foodservice or hospitality management. Students are expected to have prerequisite knowledge in accounting, management concepts, marketing, and foodservice or hospitality management. Students without these prerequisites may be admitted to the program provisionally and will be required to complete course work in these areas concurrent with their graduate work. Submission of scores from the Graduate Record Examination (GRE) is also required for admission.

Programs of study for the master of science degree are planned according to the background and interests of the student. Approximately two-thirds of the credits earned toward the degree are from courses in the major field, and one-third from supporting courses.

Students may choose one of the following plans: a minimum of 30 hours of graduate credit, including 6 hours for a master's thesis based on original research or 2 hours for a master's report; or a minimum of 36 hours of graduate credit and a comprehensive written examination.

All programs of study must include courses in statistics, computer science, and research methods. Enrollment in the departmental graduate seminar is required during two semesters of graduate study.

The Department of Hotel, Restaurant, Institution Management and Dietetics participates in the Ph.D. in human ecology, offering a specialization in institution management that includes foodservice and hospitality management.

**Undergraduate programs
Dietetics**

Bachelor of science in dietetics

Two programs are available in dietetics: Program I is the coordinated program in dietetics, and Program II is in general dietetics. See information earlier in this section.

General education courses (59-61 hours)

| | | |
|----------------------|---|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| ECON 110 | Economics I | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| Humanities electives | | 6 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 240 | Structure and Function of the Human Body | 6 |
| HRIMD 650 | Fundamentals of Public Health and Food Safety | 3 |
| | or | |
| BIOL 455 | General Microbiology | 4 |
| CHM 110 | General Chemistry | 5 |
| CHM 190 | Elementary Organic Chemistry | 3 |

| | | |
|-----------|--|---|
| CHM 191 | Elementary Organic Chemistry Lab | 2 |
| BIOCH 201 | Elementary Biochemistry | 3 |
| MATH 100 | College Algebra | 3 |
| | or | |
| | College-level calculus | |
| CIS 110 | Introduction to Personal Computing | 3 |
| | or | |
| HDFS 120 | Microcomputers in Human Services | 3 |
| STAT 320 | Elements of Statistics | 3 |
| | or | |
| STAT 330 | Elements of Statistics for the Social Sciences | 3 |
| | or | |
| STAT 340 | Biometrics | 3 |
| | or | |
| STAT 350 | Business and Economic Statistics I | 3 |
| PE 101 | Principles of Physical Fitness | 1 |

Choose one of the professional programs: I, II.

**Program I: Coordinated program in dietetics
Professional courses (61 hours)**

| | | |
|-----------|--|---|
| ACCTG 211 | Financial Accounting | 3 |
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 501 | Food Science | 3 |
| FN 502 | Principles of Nutrition | 3 |
| FN 610 | Nutrition Throughout the Life Cycle | 3 |
| FN 630 | Clinical Nutrition | 4 |
| HRIMD 430 | Introduction to Professional Dietetic Practice | 1 |
| HRIMD 440 | Fundamentals of Quantity Food Production | 5 |
| HRIMD 455 | Foodservice Systems | 4 |
| HRIMD 456 | Hotel and Foodservice Purchasing | 3 |
| HRIMD 482 | Employee Development for the Hospitality Industry | 2 |
| HRIMD 510 | Introduction to Clinical Dietetics | 1 |
| | Management semester* | |
| HRIMD 560 | Management in Dietetics | 9 |
| HRIMD 670 | Seminar in Hotel, Restaurant Management, and Dietetics | 1 |
| | Clinical semester at KSU Dietetic Center, Wichita | |
| HRIMD 520 | Applied Clinical Dietetics | 7 |
| HRIMD 521 | Clinical Dietetic Practicum | 8 |

Supporting courses (6 hours)

Choose two of the following:

| | | |
|----------|---|---|
| HDFS 110 | Introduction to Human Development | 3 |
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| HDFS 400 | Family Economics | 3 |
| FEC 105 | Introduction to Personal and Family Finance | 3 |
| FN 301 | Food Trends, Legislation, and Regulation | 3 |

Unrestricted electives 0-2

Total hours for graduation 128

*STAT course (3 hours) is to be taken during the management semester.

Program II: General dietetics**Professional courses (45 hours)**

| | | |
|-----------|--|---|
| ACCTG 211 | Financial Accounting | 3 |
| ASI 671 | Meat Selection and Utilization | 2 |
| MANGT 420 | Management Concepts | 3 |
| FN 300 | Food Preparation and Meal Management | 4 |
| FN 301 | Food Trends, Legislation, and Regulation | 3 |
| FN 501 | Food Science | 3 |
| FN 502 | Principles of Nutrition | 3 |
| FN 610 | Nutrition Throughout the Life Cycle | 3 |
| FN 630 | Clinical Nutrition | 4 |
| FN 700 | Community Nutrition | 3 |
| HRIMD 430 | Introduction to Professional Dietetic Practice | 1 |

| | | |
|-----------|---|---|
| HRIMD 440 | Fundamentals of Quantity Food Production | 5 |
| HRIMD 445 | Organization and Management of Foodservice Operations | 3 |
| HRIMD 482 | Employee Development for the Hospitality Industry | 2 |
| HRIMD 456 | Hotel and Foodservice Purchasing | 3 |

Supporting courses (9 hours)

Three of the following:

| | | |
|----------|--|---|
| CT 330 | Clothing and Society | 3 |
| HDFS 110 | Introduction to Human Development | 3 |
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| HDFS 400 | Family Economics | 3 |
| FEC 105 | Introduction to Personal and Family Finance | 3 |
| FN 612 | Principles of Food Product Development and Control | 3 |

Unrestricted electives 10-12

Total hours for graduation 125

Hotel and restaurant management

Bachelor of science in hotel and restaurant management

The hotel and restaurant management program prepares students for managerial careers in the hospitality industry. See information earlier in this section.

General education courses (54-55 hours)

| | | |
|----------------------|---|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| ENGL 516 | Written Communication for the Sciences | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| GEOG 100 | World Regional Geography | 3 |
| ECON 110 | Economics I | 3 |
| ECON 120 | Economics II | 3 |
| PSYCH 110 | General Psychology | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| Humanities electives | | 6 |
| CHM 110 | General Chemistry | 5 |
| CIS 110 | Introduction to Personal Computing | 3 |
| | or | |
| HDFS 120 | Microcomputers in Human Services | 3 |
| MATH 100 | College Algebra | 3 |
| | or | |
| | College-level calculus | |
| STAT 350 | Business and Economic Statistics I | 3 |
| BIOL 198 | Principles of Biology | 4 |
| HRIMD 650 | Fundamentals of Public Health and Food Safety | 3 |
| PE 101 | Principles of Physical Fitness | 1 |

Professional courses (34 hours)

| | | |
|-----------|---|---|
| HRIMD 120 | Introduction to Hotel and Restaurant Management | 1 |
| HRIMD 230 | Tourism and the Hospitality Industry | 2 |
| HRIMD 320 | Commercial Food Preparation and Service | 4 |
| HRIMD 440 | Fundamentals of Quantity Food Production | 5 |
| HRIMD 455 | Foodservice Systems | 4 |
| HRIMD 465 | Hotel Operations | 4 |
| HRIMD 468 | Hotel and Restaurant Law | 3 |
| HRIMD 472 | Hotel and Restaurant Marketing | 3 |
| HRIMD 475 | Field Experience in Hotel, Restaurant Management, and Dietetics | 3 |
| HRIMD 476 | Cost Controls in Hotel and Restaurant Operations | 3 |
| HRIMD 482 | Employee Development for the Hospitality Industry | 2 |

Professional electives (9 hours)

Select from the following:

| | | |
|-----------|--|---|
| ASI 671 | Meat Selection and Utilization | 2 |
| HRIMD 240 | Beverage Service in Restaurants | 2 |
| HRIMD 456 | Hotel and Foodservice Purchasing | 3 |
| HRIMD 670 | Seminar in Hotel, Restaurant Management, and Dietetics | 1 |
| MANGT 531 | Personnel and Wage Administration | 3 |
| MKTG 450 | Consumer Behavior | 3 |
| MKTG 543 | Promotional Strategies | 3 |
| POLSC 325 | U.S. Politics | 3 |
| HRIMD 466 | Convention Services and Meeting Planning | 2 |

Supporting courses (24 hours)

| | | |
|-----------|---|---|
| FN 132 | Basic Nutrition | 3 |
| HDFS 110 | Introduction to Human Development | 3 |
| | or | |
| ID 101 | Design for Contemporary Living | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| ACCTG 221 | Managerial Accounting | 3 |
| MKTG 400 | Marketing | 3 |
| MANGT 420 | Management Concepts | 3 |
| MANGT 530 | Industrial and Labor Relations | 3 |
| | or | |
| ECON 620 | Labor Economics | 3 |
| FINAN 450 | Business Finance | 3 |

Unrestricted electives 6-7

Total for graduation 128

Courses in hotel, restaurant, institution management and dietetics**Undergraduate credit**

HRIMD 120. Introduction to Hotel and Restaurant Management. (1) I. A survey of career opportunities and the scope, history, and development of the hotel and restaurant industry. Industry guest lecturers and field trips. HRIMD-120-0-1307

HRIMD 230. Tourism and the Hospitality Industry. (2) II. Analysis of tourism development and its effect on the hospitality industry. Emphasis on the economic and social values relating tourism to hotels and restaurants. HRIMD-230-0-1307

HRIMD 240. Beverage Service in Restaurants. (2) I. Procurement and merchandising of alcoholic and nonalcoholic beverages in food and beverage operations; study of spirits, wines, and beers; emphasis on responsible service of alcoholic beverages. HRIMD-240-0-1307

HRIMD 320. Commercial Food Preparation and Service. (4) I, II. Principles of food preparation; presentation and service in commercial operations, tableside cookery, cooking to order, buffets, banquets; customer relations and teamwork. Three credits rec., 1 credit lab. Pr.: HRIMD 120 or conc. enrollment and sophomore standing. HRIMD-320-0-1307

HRIMD 430. Introduction to Professional Dietetic Practice. (1) I. A study of the dietitian's role in the nutritional care of people with emphasis on the attributes and characteristics of professional practice. Pr.: Consent of instructor. HRIMD-430-0-1307

HRIMD 440. Fundamentals of Quantity Food Production. (5) I, II. Principles and methods of preparing food in quantity; considerations of menu planning, quality food, food acceptability, work methods, sanitation, safety, and production controls. Three hours rec. and six hours lab. Pr.: FN 300 or HRIMD 320; and minimum cumulative 2.0 GPA. HRIMD-440-1-1307

HRIMD 445. Organization and Management of Foodservice Operations. (3) II, in alternate years. Effective use of resources to meet organizational objectives unique to foodservice operations. Challenges of foodservice in the health care arena. Pr.: HRIMD 440 and MANGT 420. HRIMD-445-0-1307

HRIMD 455. Foodservice Systems. (4) I, II.

Foodservice operations as a system with emphasis on procurement, production, distribution, service, and maintenance. Concepts covered in lecture sessions applied in practicum. Field trip required. Two credits rec., two credits practicum. Pr.: HRIMD 440 and minimum cumulative 2.0 GPA. HRIMD-455-2-1307

HRIMD 456. Hotel and Foodservice Purchasing. (3) I, II. Purchasing of food and supplies for hotels and restaurants and institutional foodservices. Field trips required. Pr.: HRIMD 320 or FN 300. HRIMD-456-0-1307

HRIMD 465. Hotel Operations. (4) II. Analysis of the guest cycle through various operating departments. Organization and management of hotel operation systems such as front office, sales, food and beverage, properties, and housekeeping. Emphasis on departmental relationships. Three credits rec., 1 credit practicum. Pr. or conc.: HRIMD 230 and minimum cumulative 2.0 GPA. HRIMD-465-0-1307

HRIMD 466. Convention Services and Meeting Planning. (2) I. An analysis of the planning and conduct of meetings as they impact on the hotel industry. The perspectives and responsibilities of both the hotel staff and the meeting planner are explored. Pr.: HRIMD 465. HRIMD-466-0-1307

HRIMD 468. Hotel and Restaurant Law. (3) I. Legal aspects of operating hotels and restaurants, rights and responsibilities of the operator, patron civil rights, governmental regulations, franchising contracts, and commercial transactions. Pr.: HRIMD 455 or 465. HRIMD-468-0-1307

HRIMD 470. Seminar in Hotel and Restaurant Management. (1) II. Current developments and trends in hotel and restaurant management. Pr.: HRIMD 455 and 465. HRIMD-470-0-1307

HRIMD 472. Hotel and Restaurant Marketing. (3) II. Application of marketing principles to the hotel and restaurant industry through analysis of concepts, plans, and strategies. Pr.: MKTG 400; and HRIMD 455 or 465. HRIMD-472-0-1307

HRIMD 475. Field Experience in Hotel, Restaurant Management, and Dietetics. I, II, S. Supervised work experience in hotels, restaurants, or dietetic operations. Pr.: For HRM students: junior standing, HRIMD 455 or 465; and 400 hours of work experience in hotel/restaurant industry, exclusive of course work, in the preceding three years. HRIMD-475-2-1307

HRIMD 476. Cost Controls in Hotel and Restaurant Operations. (3) I. Application of accounting principles; methods of analysis and control of food, beverage, and labor costs in the hotel and restaurant operations. Relationship of cost, profit, and revenue. Pr.: ACCTG 211; and HRIMD 455 or 465. HRIMD-476-0-1307

HRIMD 480. Management in the Hotel and Restaurant Industry. (3) I, II. Management of personnel and other resources in the hotel and restaurant industry. Emphasis on employee development and training. Pr.: HRIMD 455 or 465 and MANGT 420. HRIMD-480-0-1307

HRIMD 482. Employee Development for the Hospitality Industry. (2) I, II. A discussion of the hospitality manager's and dietitian's role as a facilitator and change agent with employee and clients to increase client/guest satisfaction. Application of principles of learning and instructional strategies appropriate to changing behavior. Pr.: HRIMD 440. HRIMD-482-0-1307

HRIMD 499. Problems in Hotel, Restaurant, Institution Management and Dietetics. (Var.) I, II, S. Independent study under the supervision of a faculty member. Pr.: Consent of instructor. HRIMD-499-3-1307

Undergraduate and graduate credit

HRIMD 510. Introduction to Clinical Dietetics. (1) I, II. Application of concepts and skills in clinical dietetics in a simulated practice environment. One hour recitation a week. Pr.: FN 502; BIOCH 201; and BIOL 240. HRIMD-510-0-1307

HRIMD 520. Applied Clinical Dietetics. (7) I, II. Professional role of dietitians in the nutritional care and education of persons throughout the life cycle. Four credits recitation, 3 credits supervised practice. Pr.: HRIMD 510; FN 610, 630; and admission to coordinated program in dietetics. Taught in Wichita. HRIMD-520-2-1307

HRIMD 521. Clinical Dietetic Practicum. (8) I, II. Supervised clinical/community experience in the nutritional care of patients/clients and the promotion of dietetic services. Two credits recitation, 6 credits supervised practice. Pr.: HRIMD 510; FN 610, 630; and admission to coordinated program in dietetics. Taught in Wichita. HRIMD-521-2-1307

HRIMD 560. Management in Dietetics. (9) I, II. Functions of management in foodservice; financial control policy making, interdepartmental relationships, and foodservice planning; independent study and management experience in campus and other foodservices. Three credits rec., 6 credits practicum. Pr.: HRIMD 455, 456, 482; ACCTG 211; and admission to the coordinated program in dietetics. HRIMD-560-2-1307

HRIMD 635. Foodservice Equipment and Layout. (2) I, II. Factors affecting the selection and arrangement of equipment in foodservice systems. Field trip required. Pr.: HRIMD 440. HRIMD-635-0-1307

HRIMD 650. Fundamentals of Public Health and Food Safety. (3) I. Organization and function of food inspection services; zoonoses as related to foods of animal origin. Three hours rec. a week. (Jointly with LM 650.) Pr.: BIOL 198 and consent of staff. HRIMD-650-0-1307

HRIMD 670. Seminar in Hotel, Restaurant Management and Dietetics. (1) I, II. Current trends, research, and developments in hotel and restaurant management and dietetics. Pr.: Senior standing in hotel/restaurant management or dietetics programs. May be taken more than once. HRIMD-670-0-1307

HRIMD 710. Readings in Institution Management. (1-3) I, II, S. Directed study of current literature in institution management and related areas. HRIMD-710-3-1307

HRIMD 720. Current Issues in Hotel, Restaurant, Institution Management and Dietetics. (1-3) Recent developments and concerns related to management of dietetic services. Pr.: HRIMD 440. HRIMD-720-0-1307

HRIMD 755. Consultation in Dietetics. (2-3) II. On sufficient demand. Dietetic consultation for foodservice in small hospitals, nursing homes, and schools. Pr.: HRIMD 440. HRIMD-755-0-1307

HRIMD 780. Problems in Hotel, Restaurant, Institution Management and Dietetics. (Var.) I, II, S. Individual investigation of problems in institution management. Conferences and reports at appointed hours. Pr.: HRIMD 440; and HRIMD 480 or 560 or MANGT 420. HRIMD-780-3-1307

HRIMD 785. Practicum in Foodservice Systems Management. (1-6) I, II, S. Professional experiences in approved foodservice organization as a member of the management team under faculty supervision. Pr. or conc.: HRIMD 440; and HRIMD 480 or 560 or MANGT 420. HRIMD-785-2-1307

Graduate credit

HRIMD 805. Food Production Management. (3) II, in alternate years. Production planning and controls in foodservice systems. Decision optimization and systems analysis in foodservice organizations. Consideration of various types of foodservice systems. Pr.: HRIMD 440; and HRIMD 480 or 560 or MANGT 420. HRIMD-805-0-1307

HRIMD 810. Institution Management Research Techniques. (3) I. Survey and application of research methodology in institution management. Pr.: HRIMD 440. HRIMD-810-0-1307

HRIMD 880. Resource Procurement for Foodservice Systems. (3) II. Principles of materials management and procurement of material resources for the foodservice system. Pr.: HRIMD 440; and HRIMD 480 or 560 or MANGT 420. HRIMD-880-0-1307

HRIMD 885. Seminar in Institution Management. (1) I, II, S. Developments in research related to foodservice management. Pr.: HRIMD 440. HRIMD-885-0-1307

HRIMD 890. Foodservice Administration. (3) I. Advanced study of management applied to foodservice systems. Pr.: HRIMD 440; and HRIMD 480 or 560 or MANGT 420. HRIMD-890-0-1307

HRIMD 895. Cost Controls in Foodservice Systems. (3) II. In alternate years. Review of the components of cost control systems; analysis of financial data for foodservice operations; techniques for budget planning and control. Pr.: ACCTG 260; HRIMD 440; and HRIMD 480 or 560 or MANGT 420. HRIMD-895-0-1307

HRIMD 899. Research in Institution Management. (Var.) I, II, S. Pr.: Consent of instructor and completion of at least half of course work for M.S. in institution management. HRIMD-899-4-1307

HRIMD 980. Administration of Professional Hospitality and Dietetic Programs. (3) I, on sufficient demand. An in-depth study of the development of hospitality and dietetic education and influence of the professional organizations. Assigned observations and limited participation in administration of a hospitality or coordinated dietetic program. Pr.: EDCI 843 and 9 hours of graduate courses in HRIMD. HRIMD-980-0-1307

HRIMD 985. Advances in Institution Management. (3) I. In alternate years. Analysis of selected topics and research in institution foodservice management. Pr.: HRIMD 810 and 9 additional hours of graduate courses in HRIMD. HRIMD-985-0-1307

HRIMD 990. Dissertation Proposal Seminar. (1) I, II. Presentation and discussion of proposals for dissertation research. Pr.: Six hours of statistics, 3 hours of research design or methods, and consent of major professor. HRIMD-990-0-1307

HRIMD 999. Research in Institution Management. (Var.) I, II, S. Pr.: Consent of major professor. HRIMD-999-4-1307

Human Development and Family Studies

John P. Murray,* Head

Professors Bollman,* Jurich,* Moxley,* J. Murray,* and Russell;* Associate Professors Bergen,* Bradshaw, Jones, A. Murray,* Poresky,* Scheidt,* Schumm,* Smith, Walker, and Wanska;* Assistant Professors Balk,* Barnes,* Coulson, Miller,* Prather, and Wright;* Instructors Cantrell, Hoover, Meyer, and West; Emeriti: Professors Hoeflin,* Huyck,* Kennedy,* Long,* Morse,* and Stith;* Associate Professor McNeil;* Assistant Professor Larson.

The Department of Human Development and Family Studies focuses on the study of individuals and families from a multidisciplinary perspective. Programs emphasize developmental processes throughout the life

cycle, interpersonal relationships, family economics, and educational programming for children and families.

Undergraduate study

Five programs are available at the undergraduate level. They are consumer affairs, early childhood education, family life and community services, life span human development, and pre-law in family studies. The department offers a dual degree program in human development and family studies and social work. In addition, students often combine degree programs in early childhood education and elementary education.

The department places great importance on laboratory and field experiences along with classroom experiences.

For students pursuing early childhood education, the Early Childhood Laboratory and the Hoeflin Stone House Child Care Center provide on-campus observation and teaching. Both facilities are licensed by the State of Kansas and accredited by the National Academy of Early Childhood Programs.

Students in the family life and community services program must complete a field experience in a public or private agency that serves families, adolescents, single adults, children, or the elderly. Agency staff and department faculty guide students in the planning, direction, and evaluation of these supervised experiences. On-campus opportunities for gaining experience are available through the Family Center, Friendship Tutoring, FONE (a crisis hotline), and various organizations and offices which address students' needs.

Graduate study

The department offers the M.S. degree in the following professional specializations: adolescence and youth, early childhood education, early childhood handicapped, family life education and consultation, life span human development, and marriage and family therapy. In addition, students may participate in an emphasis in gerontology.

Each specialization provides the student with knowledge and skills in the research, theory, and practice of working with individuals and families. Comprehensive courses and practica enhance the students' opportunities for professional growth and development and for employment in diverse professional settings.

The Department of Human Development and Family Studies participates in the graduate program for the Ph.D. in human ecology with specializations in family life education and consultation, life span human development, and marriage and family therapy. The family life education and consultation specialization prepares

students for leadership positions in educational and human service organizations and agencies. Graduates from this specialization can meet the certification requirements of the National Council on Family Relations. Life span human development is a multidisciplinary program encompassing theory and research in child and adolescent development, adult development, gerontology, and thanatology. The marriage and family therapy program at both the master and doctoral levels is the third such program in the United States to be accredited by the American Association for Marriage and Family Therapy, and enables graduates to pursue careers in teaching, research, and practice.

Undergraduate programs Consumer affairs

Bachelor of science in consumer and family economics

This program allows 21 hours of professional electives for combinations of course work in consumer affairs, marketing, financial counseling, consumer education, business, or public service. Students prepare for a variety of consumer-related job opportunities.

General education courses (49-51 hours)

| | | |
|--------------------------|---|-----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| PSYCH 110 | General Psychology | 3 |
| ECON 110 | Economics I | 3 |
| ECON 120 | Economics II | 3 |
| MATH 100 | College Algebra | 3 |
| POLSC 110 | Introduction to Political Science | 3 |
| | or | |
| POLSC 325 | U.S. Politics | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| STAT 330 | Elementary Statistics for Social Sciences | 3 |
| CIS 200 | Fundamentals of Computer Programming | 2 |
| | and | |
| CIS | Computer language laboratory (200 level) | 2 |
| | or | |
| CIS 110 | Introduction to Personal Computing | 3 |
| | or | |
| HDFS 120 | Microcomputers in Human Services and the Home | 3 |
| Humanities* | | 3-4 |
| Biological sciences* | | 3-4 |
| Physical sciences* | | 3-4 |
| Social science electives | | 6 |
| PE 101 | Principles of Physical Fitness | 1 |

Professional courses (28 hours)

| | | |
|----------|---|---|
| FEC 400 | Family Economics | 3 |
| FEC 410 | Consumer Relations Practicum | 1 |
| FEC 415 | Consumer Law | 3 |
| FEC 420 | Housing | 3 |
| FEC 440 | Home Appliance Design and Evaluation | 3 |
| | or | |
| FEC 630 | Household Equipment Theory | 3 |
| FEC 700 | Families in the American Economy | 3 |
| HDFS 105 | Introduction to Personal and Family Finance | 3 |

| | | |
|---|--|------|
| HDFS 460 | Family Resource Management Theory and Application | 3 |
| HDFS 605 | Consumers and the Market | 3 |
| HDFS 705 | Financial Problems of Families | 3 |
| Professional electives** | | 21 |
| Supporting courses (16 hours) | | |
| FN 132 | Basic Nutrition | 3 |
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| Human ecology electives** | | 10 |
| Unrestricted electives | | 9-11 |
| Total hours for graduation | | 125 |

*Ten hours in these three areas.

**Selected in consultation with faculty advisor.

Bachelor of science in human development and family studies

General education

These general education courses are identical for all programs leading to a bachelor of science in human development and family studies.

| | | |
|----------------------------|--|---|
| Communication (8-9) | | |
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| or | | |
| SPCH 106 | Public Speaking I | 3 |
| Social Sciences (9) | | |
| ECON 110 | Economics I | 3 |
| PSYCH 110 | General Psychology | 3 |
| or | | |
| HDFS 110 | Introduction to Human Development | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |

Humanities electives (6)

Sciences (7)

Biological sciences and physical sciences electives
(One course must be taken from each area; one
course must include a laboratory)

Quantitative Studies (6)

| | | |
|---|---------------------------|---|
| MATH 100 | College Algebra | 3 |
| or | | |
| A college-level calculus course | | |
| Any 3-unit introductory statistics course | | |

Physical Education (1)

| | | |
|--------|--|---|
| PE 101 | Principles of Physical Fitness | 1 |
|--------|--|---|

HDFS foundation

These foundation courses form the common knowledge base for HDFS and are identical for all programs, with the exception of minor variations in early childhood education.

| | | |
|----------|---|---|
| HDFS 110 | Introduction to Human Development* | 3 |
| HDFS 301 | Helping Relationship | 3 |
| or | | |
| HDFS 420 | Interaction Techniques with Young Children | 3 |
| HDFS 302 | You and Your Sexuality | 3 |
| HDFS 310 | Early Childhood | 3 |
| HDFS 400 | Family Economics | 3 |
| HDFS 506 | Middle Childhood and Adolescence | 3 |
| HDFS 510 | Human Development and Aging | 3 |
| HDFS 550 | The Family | 3 |

*If not taken as general education course.

Early childhood education

Bachelor of science in human development and family studies

This program is for students who wish to work in prekindergarten education programs in administrative or teaching positions, including work with parents and community resources as well as with young children.

The National Council for Accreditation of Teacher Education (NCATE) has approved KSU's early childhood education program. Students completing the early childhood education program in human development and family studies are eligible for certification by the Kansas State Department of Education in Early Childhood Education. To complete the ECE program students must have full admission into the teacher education program.

Admission to teacher education

Application forms for admission to teacher education are available in the Center for Student and Professional Services, 13 Bluemont Hall. The application should be filed two years prior to graduation. (See the College of Education section of this catalog for details.) Students who do not adhere to the deadline schedule may have difficulties in scheduling HDFS 625, Directed Experiences in Early Childhood Education.

Students transferring 50 or more hours from another institution should apply at the time of initial enrollment.

Requirements for admission to early childhood teacher education programs may also be found in the College of Education section. Details concerning these requirements include:

1. Hours: 50 total hours completed including all transfer and KSU credits.
2. English Composition: Both English Composition I and II must be completed satisfactorily with a minimum of C average. Students may take an English exam if a grade average of C is not achieved.
3. Public Speaking: SPCH 105, 106, or 109. A C grade or better is required in one of the public speaking courses. Students may complete the requirement with the quiz-out conducted by the speech department.
4. Overall GPA: For full admission, a 2.5 is required in all college work attempted, including transfer and KSU credits. Probationary admission will be granted when a student has less than a 2.5 GPA attempted in all college work. The student must achieve the required 2.5 GPA by the end of the next 30 hours completed or the student will be dropped from teacher education.

5. Pre-Professional Skills Test: Students must take and pass the Pre-Professional Skills Test in reading, writing, and mathematics. The State Board of Regents has established a base score of 172 for each section. Completion of the test prior to application for admission to teacher education is required.

The Pre-Professional Skills Test will be scheduled during both fall and spring semesters. Registration for the test must be completed by the announced deadline. Application forms for registration for the test are available in 13 Bluemont Hall.

Laboratory courses

Before participating in laboratory courses involving contact with children, students must undergo a physical examination, including a tuberculosis test, at their own expense. Students must not have any physical or mental conditions that would interfere with the health, safety, or welfare of children.

Students will be screened by the Kansas Department of Health and Environment for criminal and child abuse histories (through the Kansas Bureau of Investigation and Social and Rehabilitative Services). Students with questionable histories, as determined by the Kansas Department of Health and Environment, will be prohibited from enrolling in laboratory courses which involve contact with children.

Directed experiences (student teaching)

Application for student teaching must be made no later than the semester in which the student is enrolled in HDFS 545, Early Childhood Program Lab I. Application forms are available in the advising center, Department of Human Development and Family Studies, 314 Justin Hall.

Enrollment in directed experiences is by permission only. Directed experiences may not be taken until the student has obtained full admission into teacher education.

Certification

To be eligible for certification in early childhood education the student must complete the early childhood education option, including a grade of C or better in directed experiences, and receive recommendation from the Department of Human Development and Family Studies for submission to the certifying officer of Kansas State University. Students must pass the National Teachers Examination as described in the College of Education section of this catalog.

Application for certification must be made during the semester in which the degree will be received. Forms are available in the Center for Student and Professional Services, College of Education, 13 Bluemont Hall.

General education courses (37–38 hours)

See listing at the beginning of the degree requirements.

HDFS foundation courses (12–15 hours)

| | | |
|----------|--|---|
| HDFS 110 | Introduction to Human Development* | 3 |
| HDFS 301 | Helping Relationship | 3 |
| HDFS 420 | Interaction Techniques with Young Children** | 3 |
| HDFS 310 | Early Childhood | 3 |
| HDFS 400 | Family Economics | 3 |
| HDFS 550 | The Family | 3 |

Professional supporting courses (39–42 hours)

| | | |
|-----------|--|---|
| HDFS 313 | Preschool Child Lab | 1 |
| HDFS 524 | Professional Seminar in Early Childhood | 3 |
| HDFS 528 | Exceptional Development in Early Childhood | 3 |
| HDFS 540 | Curriculum for Cognitive and Language Development for Young Children | 3 |
| HDFS 541 | Curriculum for Emotional, Social, and Physical Development of Young Children | 3 |
| HDFS 545 | Early Childhood Program Lab I | 1 |
| HDFS 546 | Early Childhood Program Lab II | 2 |
| HDFS 625 | Directed Experiences | 8 |
| HDFS 626 | Administration of Early Childhood Programs | 3 |
| FN 132 | Basic Nutrition | 3 |
| FN 352 | Concepts of Personal Health | 3 |
| FN 503 | Maternal and Child Nutrition | 3 |
| SPPAT 555 | Language Development | 3 |
| PSYCH 110 | General Psychology* | 3 |

Professional electives (12 hours)

| | | |
|-----------|--|------|
| PE 376 | First Aid/CPR*** | 1 |
| MANGT 202 | Small Business Operations | 3 |
| ACCTG 211 | Financial Accounting | 3 |
| HDFS 120 | Microcomputers in Human Services | 3 |
| HDFS 300 | Problems in HDFS: Preschool Lab Experience | Var. |
| HDFS 302 | You and Your Sexuality | 3 |
| HDFS 312 | Infant Observation Lab | 1 |
| HDFS 370 | Parenting | 3 |
| HDFS 506 | Middle Childhood and Adolescence | 3 |
| HDFS 510 | Human Development and Aging | 3 |
| HDFS 670 | Parent Education | 3 |
| HDFS 710 | Child Care: Components and Issues | 2–3 |
| HDFS 728 | Assessment of Young Children | 3 |

*Must be taken if not taken as general education course.

**Required for early childhood education students.

***First aid/CPR certification required before enrollment in HDFS 625. This requirement can be met by successful completion of Red Cross or American Heart Association courses or by American Heart Association courses or by completing PE 376.

Additional requirements for certification (14 hours)

| | |
|-----------------------------|---|
| Social science elective**** | 3 |
| Literature elective***** | 3 |

Select additional electives from the areas of humanities, social sciences, sciences, mathematics, general religion, philosophy, art and music history, and appreciation of art, architecture, music, or theatre to fulfill the general education requirements for teaching certification in early childhood education

Unrestricted electives

Total for graduation

****A minimum of 9 hours other than psychology is required for certification.

*****Literature for Children and Literature for Adolescents may not be used as a literature electives but may be used to fill additional general education requirements.

Family life and community services**Bachelor of science in human development and family studies**

Family life and community services prepares students to develop and implement preventive education programs designed to strengthen family life and family relationships. Courses focus on the development of the individual in a family context throughout the life cycle.

General education courses (37–38 hours)

See listing at the beginning of the degree requirements.

HDFS foundation courses (21–24 hours)

See listing at the beginning of the degree requirements.

Professional courses (36–39 hours)

| | | |
|--------------------------------------|---|----|
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| HDFS 370 | Parenting | 3 |
| HDFS 580 | Directed Field Experience | 8 |
| HDFS 585 | Professional Seminar in Family Life Education | 4 |
| HDFS 652 | Black Families | 3 |
| HDFS 670 | Parent Education | 3 |
| HDFS 704 | Seminar in HDFS | 3 |
| One lab (HDFS 312, 313, 507, or 508) | | 1 |
| SOCWK 260 | Introduction to Social Work | 3 |
| PSYCH 110 | General Psychology | 3* |
| PSYCH 202 | Drugs and Behavior | 2 |
| ANTH 310 | Kinship and Marriage | 3 |

Supporting human ecology courses (6 hours)

| | | |
|-----------------------------|-----------------------------|---|
| FN 352 | Concepts of Personal Health | 3 |
| Elective from CTID or HRIMD | | 3 |

Other supporting courses (11–12 hours)

A course in group processes (e.g., HDFS 440 and 441, SPCH 326, PSYCH 550)
Literature or language elective
Philosophy or language elective

One of the following history courses:

| | | |
|----------|--------------------------------------|---|
| HIST 102 | Western Civilization: The Modern Era | 3 |
| HIST 512 | Women in European History | 3 |
| HIST 541 | Women in American History | 3 |

Unrestricted electives

Total for graduation

Pre-law program**Family studies****Bachelor of science in human development and family studies**

The family studies pre-law program is for students wishing to combine the traditional foundations of a pre-law curriculum with a thorough understanding of the relations existing between the law and the family.

This program includes a strong foundation in arts and sciences, in-depth education in human development and family relationships, specialized courses in legal issues concerning families and children, and a basic introduction to the law and judicial system in this country. Students are prepared to enter law schools or law-related careers.

General education courses (37–38 hours)

See listing at the beginning of the degree requirements.

HDFS foundation courses (21–24 hours)

See listing at the beginning of the degree requirements.

Professional courses (20 hours)

| | | |
|----------|--------------------------------------|---|
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| HDFS 412 | Consumer Rights and Responsibilities | 3 |
| HDFS 515 | Family Law | 3 |
| HDFS 460 | Family Resource Management | 3 |
| HDFS 580 | Directed Field Experience | 8 |

Supporting human ecology courses (6 hours)**Supporting courses (21–24 hours)**

| | | |
|---------------------|---|----|
| PSYCH 110 | General Psychology | 3* |
| PHIL 130 | Introduction to Ethics | 3 |
| ENGL 200 | Intermediate Composition | 3 |
| ENGL 301 | Writing and the Law: Legislative Analysis | 3 |
| POLSC 325 | U.S. Politics | 3 |
| POLSC 377 | Introduction to Public Policy | 3 |
| POLSC 615 | Constitutional Law II | 3 |
| SPCH 325 | Argumentation and Debate | 3 |
| Philosophy elective | | 3 |

Unrestricted electives

Total for graduation

*If not taken as general education course.

Life span human development**Bachelor of science in human development and family studies**

This program combines the study of human development with a strong foundation in the arts, sciences, and humanities. Course work emphasizes the development of individuals across the life span, the processes underlying development and aging through the life cycle, and the factors that enhance, support, or impede human development. The life span human development program prepares students for graduate study in a variety of applied and academic fields.

General education courses (37–38 hours)

See listing at the beginning of the degree requirements.

HDFS foundation courses (21–24 hours)

See listing at the beginning of the degree requirements.

Professional courses (14–21 hours)

| | | |
|-----------|------------------------------------|----|
| HDFS 312 | Infant Observation Lab | 1 |
| HDFS 313 | Preschool Child Lab | 1 |
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| FN 352 | Concepts of Personal Health | 3 |
| HDFS 120 | Microcomputers in Human Services | 3 |
| HDFS 507 | Middle Childhood Lab | 1 |
| HDFS 508 | Adolescence Lab | 1 |
| BIOL 198 | Principles of Biology | 4* |
| BIOL 400 | Human Genetics | 3 |
| PSYCH 110 | General Psychology | 3* |

Supporting human ecology courses (6 hours)

| | | |
|-----------------------------|-----------------|---|
| FN 132 | Basic Nutrition | 3 |
| Elective from CTID or HRIMD | | 3 |

Professional electives (24 hours)

HDFS or social science electives (300 level or above)

Unrestricted electives

Total for graduation

*Must be taken if not taken as general education course.

Dual degree: Human development and family studies and social work

Bachelor of science in human development and family studies

Bachelor of science, social work major

This 150-hour program leads to a B.S. degree in human development and family studies through the College of Human Ecology, and to a B.S. degree with a social work major through the College of Arts and Sciences. The unique goal of this program is to give students skills in and knowledge of interpersonal relationships, an understanding of the developmental processes of children and families, and beginning social work skills. Upon completion of the program students are equipped to work with families and individuals in social work settings. They are also eligible to take the social work licensure examination. The social work major, housed in the Department of Sociology, Anthropology, and Social Work, is accredited by the Council on Social Work Education.

General education courses (56-57 hours)

| | | |
|-----------|--|---|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking IA | 2 |
| | or | |
| SPCH 106 | Public Speaking I | 3 |
| PSYCH 110 | General Psychology | 3 |
| ECON 110 | Economics I | 3 |
| POLSC 301 | Introduction to Political Thought | 3 |
| SOCIO 211 | Introduction to Sociology | 3 |
| BIOL 198 | Principles of Biology | 4 |
| | Physical science with lab | 4 |
| | Biological or physical science | 3 |
| | Biological or physical science with pr. in the same department | 3 |
| MATH 100 | College Algebra | 3 |
| STAT 330 | Elementary Statistics for Social Science | 3 |
| | Fine arts elective | 3 |
| | Philosophy elective | 3 |
| | Literary or rhetorical arts course | 3 |
| | Western heritage course | 3 |
| ANTH 200 | Introduction to Cultural Anthropology | 3 |
| PE 101 | Principles of Physical Fitness | 1 |

Human development and family studies (25 hours)

| | | |
|----------|------------------------------------|---|
| HDFS 230 | Introduction to Human Development | 3 |
| HDFS 310 | Early Childhood | 3 |
| HDFS 313 | Preschool Child Lab | 1 |
| HDFS 350 | Family Relationships and Sex Roles | 3 |
| HDFS 430 | Middle Childhood | 2 |
| HDFS 431 | Middle Childhood Lab | 1 |
| HDFS 510 | Human Development and Aging | 3 |
| HDFS 520 | The Adolescent | 2 |
| HDFS 521 | The Adolescent Lab | 1 |
| HDFS 530 | The Family | 3 |
| HDFS 670 | Parent Education | 3 |

Human ecology supporting courses (12 hours)

| | | |
|----------------|------------------|---|
| FN 132 | Basic Nutrition | 3 |
| HDFS 400 | Family Economics | 3 |
| HDFS electives | | 6 |

Social work professional courses (46 hours)

| | | |
|-----------|--|----|
| SOCWK 260 | Introduction to Social Work | 3 |
| SOCWK 562 | Field Placement | 12 |
| SOCWK 510 | Social Welfare as a Social Institution | 3 |
| SOCWK 550 | Field Practicum Research | 1 |
| SOCWK 560 | Social Work Practice I | 3 |
| SOCWK 561 | Social Work Practice II | 3 |
| SOCWK 564 | Social Work Professional Seminar | 3 |

| | | |
|-----------|--------------------------------------|---|
| SOCWK 565 | Program and Policy Formation | 3 |
| SOCWK 567 | Human Behavior in Social Environment | 3 |
| SOCWK 568 | Social Work Practice III | 2 |
| SOCIO 532 | Community Organization | 3 |
| SOCIO 520 | Methods of Social Research | 4 |
| SOCIO 571 | Comparative Social Theories | 3 |

Unrestricted electives 10-11

Total for graduation 150

See Department of Sociology, Anthropology, and Social Work, College of Arts and Sciences, regarding acceptance into the social work component of this program.

Courses in human development and family studies

Undergraduate credit

HDFS 105. Introduction to Personal and Family Finance. (3) 1, 11. Fundamental principles for making financial decisions. Analysis and evaluation of personal and family money management strategies. HDFS-105-0-1304

HDFS 110. Introduction to Human Development. (3) 1, 11. A study of life span human development through an individual's awareness and understanding of his or her own physical, social, and psychological growth and relationships with family, peers, and others. HDFS-110-0-1305

HDFS 120. Microcomputers in Human Services. (3) 1, 11, S. Introduction to the application of microcomputer systems for early childhood education, family life education, information processing, and access to national information networks. Rec. and lab. HDFS-120-1-1305

HDFS 300. Problems in Human Development and Family Studies. (Var.) 1, 11, S. Independent or small group study. Pr.: Consent of instructor. HDFS-300-3-1305

HDFS 301. The Helping Relationship. (2-3) 1, 11. Characteristics of the helping relationship; consideration of personal qualities necessary for recognizing needs of individuals and families; identification of effective procedures for referral to appropriate professions and agencies. Pr.: HDFS 110 or PSYCH 110. HDFS-301-0-1305

HDFS 302. You and Your Sexuality. (3), 1, 11, S. Study of the role and meaning of human sexuality in relation to oneself as well as in interrelationships with others. Pr.: HDFS 110 or PSYCH 110. HDFS-302-0-1305

HDFS 310. Early Childhood. (3) 1, 11. Principles of growth and development of children from conception through age five, including familial, societal, and other ecological factors affecting young children's development. Pr.: HDFS 110 or PSYCH 110. HDFS-310-0-1305

HDFS 312. Infant Observation Lab. (1) 1, 11, S. Observation of the behavior and development of children from infancy through toddlerhood. Prior or concurrent enrollment with HDFS 310. HDFS-312-1-1305

HDFS 313. Preschool Child Lab. (1) 1, 11, S. On sufficient demand. Observation of the development and guidance of children from 18 months to five years of age with emphasis on observation of children in groups. Prior or concurrent enrollment with HDFS 310. HDFS-313-1-1305

HDFS 350. Family Relationships and Sex Roles. (3) 1, 11, S. Effects of family interaction upon individual development and sex roles; consideration of premarital, marital, and parent-child relationships. Pr.: HDFS 110 or PSYCH 110 or SOCIO 211. HDFS-350-0-1305

HDFS 370. Parenting. (2-3) 1, 11, S. Principles and philosophies of parenting. How to establish a nurturing relationship between parents and their children. HDFS-370-0-1305

HDFS 400. Family Economics. (3) 1, 11. The influence of socioeconomic factors on families. Emphasis on current economic issues and their potential for impacting families and society. Pr.: ECON 110 or conc. enrollment. HDFS-400-0-1304

HDFS 405. Advanced Personal and Family Finance. (3) 11. In-depth applications of personal and family money management principles with emphasis on credit, savings, insurance, and budgeting. Pr.: HDFS 105. HDFS-405-1-1304

HDFS 412. Consumer Rights and Responsibilities. (3) 1, 11. Issues and problems confronting consumers. Economic and legal implications of governmental policies and consumer choices. HDFS-412-0-1304

HDFS 420. Interaction Techniques with Young Children. (3) 1. A developmental approach to the acquisition of interaction techniques conducive to healthy emotional and self-concept growth in the child from birth to five years. Two hours lec. and one hour lab. Pr.: HDFS 310. HDFS-420-0-1305

HDFS 440. Human Development Facilitation. (2) 1, 11. Applied study of leadership skills in small discussion groups, with emphasis on learning and facilitating Introduction to Human Development concepts. Taken conc. with HDFS 441. Pr.: HDFS 230, preparatory workshop, and consent of instructor. HDFS-440-0-1305

HDFS 441. Human Development Facilitation Lab. (1) 1, 11. Recitation group leader for HDFS 230. Assists students in discussion and preparing group presentations; evaluates written work and course participation of students in group. Conc. HDFS 440. HDFS-441-1-1305

HDFS 460. Family Resource Management Theory and Application. (3) 11. The processes by which individuals and families identify, develop, and allocate resources. Projects emphasize practical applications of resource management theory. HDFS-460-1-1304

HDFS 499. Independent Study in Family Economics. (V) 1, 11, S. Independent study. Pr.: Consent of instructor. HDFS-499-3-1304

Undergraduate and graduate credit in minor field

HDFS 506. Middle Childhood and Adolescence. (3) 11. Principles of growth and development during middle childhood and adolescence, including familial, societal, and other ecological factors affecting development of youth. Pr.: HDFS 110 or PSYCH 110. HDFS-506-0-1305

HDFS 507. Middle Childhood Lab. (1) 11. Analysis of situations facing children age six to twelve and design of interventions to enable these children to cope with these situations. Prior or concurrent enrollment in HDFS 506. HDFS-507-1-1305

HDFS 508. Adolescent Lab. (1) 11. Analysis of situations facing adolescents and design of interventions to enable adolescents to cope with these situations. Prior or concurrent enrollment in HDFS 506. HDFS-508-1-1305

HDFS 510. Human Development and Aging. (3) 1. Survey of issues, research, and problems in aging and human development throughout adulthood, with particular emphasis upon the later years. Pr.: HDFS 230 or PSYCH 280. HDFS-510-0-1305

HDFS 515. Family Law. (3) 1. Survey of legal issues concerning children and families. Topics include: human rights and responsibilities; marriage, divorce, paternity, child custody; estate and intergenerational transfer; and juvenile codes and school law. Pr.: HDFS 110 or PSYCH 110. HDFS-515-0-1305

HDFS 524. Professional Seminar in Early Childhood Education. (3) 11. Examination of programs for young children, including philosophical and theoretical foundations. Implementation and evaluation of program models and related issues and research. Pr.: HDFS 310 or PSYCH 280. HDFS-524-0-1305

HDFS 528. Exceptional Development in Early Childhood. (3) 11. Exceptional development in early childhood (birth to five years), including sensory impairments, physical impairments, communication disorders, mental retardation, behavioral problems, and gifted performance; formal and informal assessment in all developmental areas; the family's role in the assessment/referral/intervention process. Pr.: HDFS 310. HDFS-528-0-1305

HDFS 540. Curriculum for Cognitive and Language Development of Young Children. (3) 1. Planning for the enhancement of cognitive and language development. The application of child development theory to the planning of programs for young children within the major curriculum areas. Conc. with HDFS 545 or 546. Pr.: HDFS 310 and 313. HDFS-540-0-1305

HDFS 541. Curriculum for Emotional, Social, and Physical Development of Young Children. (3) 11. Planning for the enhancement of physical, social, and emotional development. The application of child development theory to the planning of programs for young children within the major curriculum areas. Conc. with HDFS 545 or 546. Pr.: HDFS 310 and 313. HDFS-541-0-1305

HDFS 545. Early Childhood Program Lab I. (1) 1, 11. Application of principles and techniques to planning, implementing, and evaluating developmentally appropriate activities for young children in a supervised lab setting and in recitation sessions. Conc. with HDFS 540 or 541. Pr.: HDFS 310 and 313. HDFS-545-1-1305

HDFS 546. Early Childhood Program Lab II. (2) 1, 11. Advanced application of principles and techniques for developmentally appropriate programs for young children. Planning, implementing, and evaluating activities in a supervised lab setting. Conc. with HDFS 540 or 541. Pr.: HDFS 545. HDFS-546-1-1305

HDFS 550. The Family. (3) 1, S. Consideration of the family throughout the family life cycle; developmental tasks at each stage. Use and impact of family support services. Pr.: Nine hours in HDFS or other social science and junior standing. HDFS-550-0-1305

HDFS 580. Directed Field Experience. (8) 1, 11. A block field placement in local agencies. Faculty-supervised experience in direct service to clients: individuals, groups, and communities. Weekly seminar during placement emphasizes theory underlying the practice. Pr.: HDFS 301 or SOCWK 260; HDFS 550; and consent of instructor. HDFS-580-2-1305

HDFS 585. Professional Seminar in Family Life Education. (4) 1, 11. Consideration of professional philosophy, identity, ethics, career development, and characteristics of client populations. Development of skills for family life educators working in agencies with various socioeconomic, age, and ethnic groups. Pr.: Conc. enrollment in HDFS 580. HDFS-585-0-1305

HDFS 590. Proseminar in Human Development and Family Studies. (1-3) On sufficient demand. Review of specific issues or professional practices affecting children and/or families. Pr.: Junior standing and consent of instructor. HDFS-590-0-1305

Undergraduate and graduate credit

HDFS 600. Economic Status of Women. (3) 11, in alternate years. Socioeconomic factors affecting the economic roles of women. Income, wealth, discrimination, employment, household production, and attitudes as they pertain to the economic position of women in society. Pr.: Junior standing and ECON 110. HDFS-600-0-1304

HDFS 605. Consumers and the Market. (3) 1, in alternate years. Consumption behavior studied with a focus on social and economic variables. Pr.: ECON 110. HDFS-605-0-1304

HDFS 625. Directed Experiences in Early Childhood Education. (8) 1, 11, S. Participation in a preschool program; planning, instruction, evaluation. Pre-arrangement and consent of instructor required. Pr.: HDFS 540 and 541 and full admission into teacher education. HDFS-625-2-1305

HDFS 626. Administration of Early Childhood Programs. (3) 1. Rationale for and techniques of administering programs for preschool children, including health, education, social services, parent involvement. Pr.: Nine hours of human development and family studies. HDFS-626-0-1305

HDFS 652. Black Families. (2-3) Selected topics for understanding life styles of black families. Implications for professionals working with black children and families. Pr.: Nine hours in HDFS or other social science and junior standing. HDFS-652-0-1305

HDFS 654. Death and the Family. (2-3) 1, S. Exploration of contemporary attitudes toward death and dying; related influences on individual development and family life. Pr.: HDFS 650 or SOCIO 640. HDFS-654-0-1305

HDFS 670. Parent Education. (3) 1, 11. Principles in child development and family relationships applied to professional group and individual work with parents. Pr.: HDFS 370 and 550. HDFS-670-0-1305

HDFS 675. Field Study in Family Economics. (1-3) 1, 11. Supervised experiences in financial counseling, community action, or consumer services. Pr.: Consent of instructor. HDFS-675-2-1304

HDFS 700. Problems in Human Development and Family Studies. (Var.) 1, 11, S. Independent study on aspects of human development and family studies. Pr.: Consent of instructor. HDFS-700-3-1305

HDFS 704. Seminar in Human Development and Family Studies. (Var.) 1, 11, S. Interpretation and evaluation of information on varied topics relating to family members. May be taken for a maximum of nine hours. Pr.: Nine hours of HDFS or other social science. HDFS-704-0-1305

HDFS 705. Financial Problems of Families. (3) 1, in alternate years. Analysis of financial problems confronting families. Application of family economic theory to major financial decisions made by families. Pr.: HDFS 405. HDFS-705-0-1304

HDFS 708. Topics in Human Development and Family Studies. (2-3) 1, 11, S. Review of recent research and theory related to exploration of methods and family and interpersonal processes. Pr.: Consent of instructor. May be taken more than one semester. HDFS-708-0-1305

HDFS 710. Child Care: Components and Issues. (2-3) On sufficient demand. Resources and facilities of quality child care; exploration of methods and philosophies of such programs; designed for those working with paraprofessional child care personnel. Pr.: Fifteen hours of either social science and/or HDFS. HDFS-710-0-1305

HDFS 715. Families in the American Economy. (3) 11, in alternate years. Impact of socio-economic and public policy factors on family economic well-being. The special issues faced by financially disadvantaged and non-traditional households will be addressed. Pr.: Nine hours in HDFS or other social sciences. HDFS-715-0-1304

HDFS 728. Assessment of Young Children. (3) 1. Theory and practice of individual assessment of handicapped and normal children, infancy to age eight, including cognitive, language, fine and gross motor, social, and self-help skills. Focus on selection, administration, interpretation, and evaluation of screening and comprehensive evaluation instruments for assessment and individual program planning. Pr.: HDFS 310. HDFS-728-0-1305

HDFS 760. Family Decision Making. (3) 11, in alternate years. Analysis of conceptual frameworks of processes by which families and individuals allocate resources. Pr.: HDFS 460 and 550. HDFS-760-0-1304

HDFS 770. Economics of Aging. (3) 11, in alternate years. Analysis of economic factors associated with aging; implications for individuals, society, and the economy. Pr.: Nine hours of HDFS or other social sciences. HDFS-770-0-1304

Graduate credit

HDFS 810. Child Development. (3) 1, 11. Behavioral characteristics and developmental processes in childhood and adolescence. Analysis of developmental trends and issues in terms of research evidence and theoretical expectations. Pr.: HDFS 310; and 3 additional hours in HDFS or child psychology. HDFS-810-0-1305

HDFS 815. Infant Behavior and Development. (3) 11. In alternate years. Study of the infant as a developing individual within the family; examination of the theories and research relevant to development from conception through the second year. Pr.: HDFS 310, 810; and BIOL 198. HDFS-815-0-1305

HDFS 820. Theories of Child Development. (3) 1. Theories of development relating to physical, social, and psychological patterns of children's growth and interaction with the family and the community. Pr.: HDFS 310; and three additional hours in HDFS or child psychology. HDFS-820-0-1305

HDFS 822. Transition to Adulthood. (3) S. In alternate years. Advanced study of theory and research of the transition period from adolescence through youth to adulthood. Pr.: HDFS 520 and 810. HDFS-822-0-1305

HDFS 824. Parent-Child Interaction: Theory and Research. (3) 11. Developmental theories and empirical research concerning the reciprocal interactions between parents and their children focusing on the socialization of the child within the family. Pr.: HDFS 810. HDFS-824-0-1305

HDFS 830. Advanced Program Development. (2-3) Alternate 11. Analysis of the process and application of child development theory to early childhood program planning. Pr.: HDFS 820. HDFS-830-0-1305

HDFS 845. Adult Development and Aging. (3) 11. Developmental aging research as related to individual, social, and family functioning throughout adulthood. Pr.: Twelve hours social science. HDFS-845-0-1305

HDFS 850. Family Studies. (3) 11. Survey of family research literature to illustrate various approaches to the study of the family and to understand family changes within the life cycle. Pr.: HDFS 650; and STAT 330 or 702. HDFS-850-0-1305

HDFS 852. Contemporary Family Theories. (3) 1. Survey of contemporary family conceptual frameworks and theoretical perspectives, with emphasis on the application of family theory in basic and applied family research. Pr.: HDFS 650; and STAT 330 or 702. HDFS-852-0-1305

HDFS 855. Family Crisis. (3) 1. The nature of stress in the family from a theoretical and research base, focusing on the genesis of family crisis and the family's response to stress and crisis. Pr.: HDFS 650. HDFS-855-0-1305

HDFS 862. Marital Interaction. (3) 1. A study of the dynamics of marital interaction with emphasis upon the interpersonal relationships and processes of adjustment. Pr.: HDFS 350 and 650 and consent of instructor. HDFS-862-0-1305

HDFS 863. Single-Parent and Reconstituted Families. (3) 1, 11. Survey of research literature regarding single-parent and reconstituted families. Demography, complexity, problems, strengths, and processes of adjustment of family units and their members. Implications for professionals working with these families. Pr.: HDFS 650. HDFS-863-0-1305

HDFS 864. Clinical Theory and Practice. (3) 1. Frameworks and skills for helping individuals within the family context. Study and observation of operations in family clinical programs and family therapy. Pr.: HDFS 272; HDFS 560 and consent of instructor. HDFS-864-0-1305

HDFS 865. Human Sexuality. (3) II, alternate S. Focus on implications of personal and familial aspects of human sexuality throughout the life cycle. Pr.: HDFS 350 and six hours social science. HDFS-865-0-1305

HDFS 870. Principles of Marriage and Family Therapy. (3) II, S. Examination of processes in marriage and family therapy; study of interactions within the therapeutic setting; and application of knowledge of the family and of marriage to the helping relationship. Pr.: HDFS 852 and 864 or EDAF 823 and permission of instructor. HDFS-870-0-1305

HDFS 871. Family Life Education and Consultation. (3) I, II. Theory and procedures for family life education and consultation with professional and volunteer staff in a variety of settings. Pr.: HDFS 550. HDFS-871-0-1305

HDFS 875. Delivery of Human Services. (3) I, II, alternate S. Cognitive and experiential understanding of professional responsibilities in working effectively with families in an educational outreach or consultative setting. Pr.: HDFS 879. HDFS-875-0-1305

HDFS 878. Professional Studies In Family Therapy. (3) I. Analysis of professional issues, techniques, and responsibilities associated with working effectively with families in a family therapy setting. Pr.: HDFS 864 or conc. enrollment and consent of instructor. HDFS-878-0-1305

HDFS 880-885. Practica in Human Development and Family Studies. (Var.) I, II, S. Supervised experience in providing help and/or instruction in the several areas of human development and family studies presented in terms of the special interests of the students. Consent of practicum supervisor is required for each.

HDFS 880. Practicum in Counseling. Same as PSYCH 860 and EDAF 863. Pr.: HDFS 870 and EDAF 823. HDFS-880-2-1305

HDFS 881. Practicum in Family and Community Services. Pr.: HDFS 875 and 879. HDFS-881-2-1305

HDFS 882. Practicum in Study of Student Development. HDFS-882-2-1305

HDFS 883. Practicum in Early Childhood Education. Pr.: HDFS 535. HDFS-883-2-1305

HDFS 884. Practicum in Parent Education. Pr.: HDFS 670. HDFS-884-2-1305

HDFS 885. Practicum in Marriage and Family Therapy. (3) Supervised experience in marriage and family therapy. Designed for master's level students. Pr.: HDFS 870; HDFS 878 and admission to marriage and family therapy program.

HDFS 890. Research Methods In Human Development and Family Studies. (3) I, II. Study and application of family and human developmental methodology for research in graduate programs and professional careers. Pr.: STAT 330 or 702. HDFS-890-0-1305

HDFS 891. Family Survey Research. (3) II. Principles and techniques for collection, coding, analysis, and interpretation of survey data from several family members. Computer-oriented. Pr.: STAT 330, HDFS 650 and 890. HDFS-891-0-1305

HDFS 892. Practicum In Human Development Research. (Var.) I, II, S. Observation, modification, and reporting of behavior. Pr.: HDFS 890; course in methods of research; 9 other graduate hours in human development and family studies; consent of instructor. HDFS-892-4-1305

HDFS 894. Readings In Human Development and Family Studies. (Var.) I, II, S. Implications of research findings in preparation for professional work in counseling, teaching, and research in human development and family studies. Pr.: Twelve hours in social-behavioral science; and consent of instructor. May be taken for a maximum of 9 hours. HDFS-894-3-1305

HDFS 895. Principles and Techniques of Family Measurement. (3) II. The comparative reliability and validity of current measures of family interaction and analysis of their suitability for use in program evaluation of family life education and family therapy. Pr.: HDFS 850 and a graduate-level research methods course. HDFS-895-0-1305

HDFS 896. Advanced Family Therapy. (3) II. Analysis of care management issues and literature related to the application of advanced techniques in family therapy. To be taken concurrently with HDFS 885. Pr.: HDFS 870 and consent of instructor. HDFS-896-0-1305

HDFS 899. Research In Human Development and Family Studies. (Var.) I, II, S. Individual research problems which may form the basis for the master's thesis or report. Pr.: Consent of major professor. HDFS-899-4-1305

HDFS 908. Topics in Family Life Education and Consultation. (3) On sufficient demand. Recent research, theory construction, and program development; focusing on selected relevant topics. Designed for doctoral students in family life education and consultation. Pr.: HDFS 879. HDFS-908-0-1305

HDFS 910. Topics In Marriage and Family Therapy. (1-3) I, II. Examination of recent research, theory, and clinical practice related to marriage and family therapy. Pr.: HDFS 870 and consent of instructor. May be taken up to 9 hours. HDFS-910-0-1305

HDFS 930. Human Development Seminar. (3) Analysis of the continuous and systematic changes in the development of individuals as they interact with their physical and social environments. Pr.: HDFS 810, 820, and 845. May be taken for a maximum of 12 hours. HDFS-930-0-1305

HDFS 950. Advanced Family Theory. (3) I. In alternate years. Examination of theoretical approaches to the study of the family unit from the perspective of interpersonal relationships. Emphasis on axiomatic theory construction in contemporary family studies literature. Pr.: HDFS 850, 852, and 890. HDFS-950-0-1305

HDFS 979. Advanced Family Life Education and Consultation. (3) II. In alternate years. Theory and practices of family life education and consultation, including issues of development of the family life profession and national family policy. Pr.: HDFS 879. HDFS-979-0-1305

HDFS 981. Advanced Practicum in Family and Community Services. (1-3) Supervised experience in family life education and consultation. Pr.: HDFS 875, 879, 881, and consent of instructor; may be taken for a maximum of 6 hours. HDFS-981-2-1305

HDFS 985. Ph.D. Practicum in Marriage and Family. (1-3) I, II, S. Supervised experience in family therapy. Consent of instructor is required. Pr.: HDFS 880. May be taken for up to 9 hours. HDFS-985-2-1305

HDFS 986. Practicum in Supervision of Marriage and Family Therapy. (1-3) I, II, S. Supervised experience in supervision of marital and family therapy. Consent of instructor required. Pr.: HDFS 985. May be taken for up to 9 hours. HDFS-986-2-1305

HDFS 988. Conjoint and Group Techniques in Family Counseling. (3) II, S. Advanced theory in marriage and family counseling with emphasis on group techniques. Pr.: HDFS 880 and consent of instructor. HDFS-988-0-1305

HDFS 990. Dissertation Proposal Seminar. (1) I, II. Presentation and discussion of proposals for dissertation research. Pr.: Six hours of statistics, 3 hours of research design or methods, and consent of major professor. HDFS-990-0-1305

HDFS 999. Research in Human Development and Family Studies. (Var.) I, II, S. Pr.: Consent of major professor. HDFS-999-4-1305

Veterinary Medicine

Michael D. Lorenz, Dean
Carolyn V. Roberts, Assistant Dean

101 Trotter Hall
532-5660

General Requirements

Admission

Enrollment in the College of Veterinary Medicine is limited to well-qualified students who have completed the minimum 70 required hours of pre-professional courses (see pre-professional requirements). A student must have at least a B (3.0) average over the pre-professional requirements and over the last 45 hours of undergraduate college work in order to be eligible for an interview. A grade below a C in a pre-professional requirement is not acceptable. Nonresidents must meet the same scholastic requirements to receive an application for the professional curriculum and consideration for selection.

Personal interviews are required of all students under consideration. Selection is based upon academic achievement and professional potential as determined by the interview with the Admissions Committee. Applicants are evaluated on such items as motivation, maturity, communication skills, experience with and knowledge of animals, and experience with and knowledge of veterinary medicine. Therefore, all students interested in applying to the College of Veterinary Medicine are encouraged to have adequate animal exposure and to have work experience related to veterinary medicine to demonstrate to the admissions committee an understanding of the profession.

Selection for admission to the curriculum in veterinary medicine is based on individual merit of qualified applicants who are graduates of Kansas high schools and/or who have been residents for at least three years immediately prior to first semester enrollment of the year for which they are applying.

After Kansans are selected, nonresidents from states with which KSU has a contract to provide veterinary medical education and who are certified by their state will be selected. Since the contract status may change yearly, interested applicants should contact the associate dean, College of Veterinary Medicine, for current information regarding contract states. There is also a limited number of at-large positions

available. Applicants for these positions may be considered after highly qualified Kansas residents and certified residents of contract states are selected. In the selection of the at-large positions, priority will be given to residents/citizens of the United States.

On September 1, applications for admission to the professional curriculum may be obtained from the Office of the Associate Dean of the College of Veterinary Medicine for consideration in the next class.

No applications are accepted after January 30.

Pre-professional requirements

The pre-professional work may be pursued at Kansas State University in the College of Arts and Sciences or the College of Agriculture or in other academically accredited institutions.

Listed below are required courses, with KSU course numbers listed at left.

Requirements

| | | |
|-----------------------------------|--------------------------------------|----|
| ENGL 100 | English Composition I | 3 |
| ENGL 120 | English Composition II | 3 |
| SPCH 105 | Public Speaking | 2 |
| or | | |
| SPCH 106 | | |
| CHM 210 | Chemistry I | 4 |
| CHM 230 | Chemistry II | 4 |
| CHM 350 | General Organic Chemistry | 3 |
| CHM 351 | General Organic Chemistry Laboratory | 2 |
| BIOCH 521 | General Biochemistry | 3 |
| BIOCH 522 | General Biochemistry Laboratory | 2 |
| PHYS 113 | General Physics I | 4 |
| PHYS 114 | General Physics II | 4 |
| BIOL 198 | Principles of Biology | 4 |
| BIOL 510 | Embryology | 3 |
| BIOL 511 | Embryology Laboratory | 1 |
| BIOL 455 | Microbiology (with lab) | 4 |
| ASI 102 | Principles of Animal Science | 3 |
| ASI 103 | Dairy Science | 1 |
| ASI 104 | Poultry Science | 1 |
| ASI 105 | Animal Sciences and Industry | 1 |
| ASI 318 | Fundamentals of Nutrition | 3 |
| ASI 500 | Genetics | 3 |
| Social sciences and/or humanities | | 12 |
| | | 70 |

All science courses (chemistry, physics, biology, and genetics) must have been taken within six years of the date of application. All pre-professional requirements must be graded.

A bachelor of science degree may be granted by the College of Agriculture or the College of Arts and Sciences upon completion of residency and academic requirements. Detailed information should be obtained from the dean's office of the appropriate college.

Fees for veterinary medical students

See the Fees section in this catalog.

Doctor of veterinary medicine curriculum

The curriculum in veterinary medicine at Kansas State University was established to give Kansas residents preparation for entry into a variety of veterinary medical careers. While the professional curriculum in veterinary medicine is balanced and comprehensive with consideration given to all species, emphasis is placed on food animal diseases.

The academic standards of the College of Veterinary Medicine govern honors, progression, probation, and dismissal. Students will be informed of their academic status by the dean's office based on information supplied by the University registrar. The scholastic record of each student will be reviewed following each period of required registration in the veterinary curriculum.

Studies must be taken as prescribed. Elective courses may be taken with permission only.

See the Graduate School section for the program leading to the M.S. and Ph.D. degrees.

For admission to the curriculum in veterinary medicine, consult the previously listed pre-professional requirements.

Completion of the professional curriculum leads to the degree of doctor of veterinary medicine. (Hours required for graduation: pre-professional—70; professional—165; total—235.)

First professional year

Fall semester

| | | |
|--------|-------------------------------------|----|
| AP 700 | Gross Anatomy I | 6 |
| AP 710 | Microanatomy | 5 |
| AP 737 | Veterinary Physiology I | 6 |
| AP 740 | Veterinary Orientation | 1 |
| AP 702 | Animal Nutrition and Diet Formation | 2 |
| | | 20 |

Spring semester

| | | |
|--------|---|----|
| AP 705 | Gross Anatomy II | 6 |
| AP 715 | Developmental Organology and Placentation | 2 |
| AP 747 | Veterinary Physiology II | 6 |
| AP 801 | Clinical Skills I | 1 |
| LM 705 | Veterinary Immunology | 2 |
| LM 755 | Principles of Epidemiology | 2 |
| SM 741 | Ethics and Jurisprudence | 1 |
| | | 20 |

Second professional year

Fall semester

| | | |
|--------|--------------------------------------|----|
| AP 770 | Pharmacology | 5 |
| LM 712 | Veterinary Bacteriology and Mycology | 5 |
| LM 715 | Veterinary Parasitology | 5 |
| PA 703 | General Pathology | 5 |
| | | 20 |

Spring semester

| | | |
|--------|---------------------------|-----------|
| LM 722 | Veterinary Virology | 3 |
| LM 775 | Clinical Pathology | 3 |
| PA 710 | Systemic Pathology | 5 |
| PA 859 | Laboratory Animal Science | 2 |
| SM 805 | Surgery I | 3 |
| SM 830 | Medicine I | 4 |
| SM 802 | Clinical Skills II | 1 |
| | | 21 |

Third professional year**Fall semester**

| | | |
|--------|----------------------|-----------|
| LM 777 | Laboratory Diagnosis | 1 |
| PA 847 | Avian Diseases | 3 |
| SM 814 | Small Animal Surgery | 4 |
| SM 820 | Theriogenology | 3 |
| SM 824 | Food Animal Medicine | 4 |
| SM 850 | Medicine II | 4 |
| SM 895 | Toxicology | 3 |
| | | 22 |

Spring semester

| | | |
|--------|------------------------------------|-----------|
| LM 753 | Zoonosis and Preventative Medicine | 3 |
| LM 875 | Production Medicine | 2 |
| SM 803 | Clinical Skills III | 1 |
| SM 811 | Large Animal Surgery | 4 |
| SM 821 | Companion Animal Medicine | 4 |
| SM 840 | Radiology | 3 |
| SM 886 | Clinical Nutrition | 3 |
| | | 20 |

Fourth professional year**Summer, fall, and spring semesters**

33 hours required core rotations:

Small Animal Medicine
 Small Animal Surgery
 Equine Medicine and Surgery
 Agricultural Practice
 Radiology/Anesthesiology
 Necropsy-Toxicology-Public Health-MARC/Elective

Plus minimum 9 hours of mini-electives and/or rotational electives.

Veterinary medical library

The College of Veterinary Medicine has a well-equipped library consisting of approximately 20,000 volumes which deal with all phases of veterinary medical literature and many allied fields. It subscribes to 700 journals and has a large audiovisual collection of more than 1,500 items. Numerous additional textbooks and journals are available at the main library on campus.

Anatomy and Physiology

H. H. Erickson,* Acting Head

Professors Clarenburg,* Erickson,* Fedde,* Frey,* Klemm,* Oehme,* Quadri,* Upson,* and Westfall,* Associate Professors Blecha,* Cash,* and Hartke,* Assistant Professor Troyer,* Instructor Davis; Emeriti: Professor Weinman; Adjunct Professors Gardner, Hand,* Leedle, and Lewis.*

The Department of Anatomy and Physiology presents courses in physiology, pharmacology, physiological chemistry, nutrition, gross anatomy, and microscopic anatomy at both the undergraduate and graduate levels.

Biophysical electronic instrumentation, an electron microscope, environmental chambers, scintillation counter, respiratory mass spectrometer, treadmills, and other instruments are available for physiological and anatomical studies.

The graduate program in anatomy and physiology leads to the doctor of philosophy degree and the master of science degree with specialties in the areas of anatomy, pharmacology, physiological chemistry, physiology, and toxicology.

A combined anatomy-physiology course and a course in pharmacology of farm animals are offered for undergraduate and graduate students outside veterinary medicine.

Undergraduate and graduate credit in minor field

AP 530. Anatomy and Physiology. (4) II. General anatomy and physiology of the domestic animals. Three hours rec. and three hours lab a week. Same as ASI 533. AP-530-1-1218

AP 531. Introduction to Pharmacology of Farm Animals. (2) II, in even years. The study of the basic principles of pharmacology as related to the proper and safe use of drugs and chemicals by the livestock industry. Same as ASI 534. Pr.: AP 530 or equiv. AP-531-0-1218

Undergraduate and graduate credit

AP 700. Gross Anatomy I. (6) I. Gross dissection of the dog with comparative aspects of the cat. Three hours lec. and nine hours lab a week. Pr.: First-year standing in College of Veterinary Medicine. AP-700-1-1218

AP 702. Animal Nutrition and Diet Formulation. (2) I. Application of basic nutrition principles, diet formulation, and diet adequacy for livestock, poultry, pets, and exotic animals. Includes practical feeding problems encountered by producers and veterinarians. Same as ASI 702 and SM 702. Pr.: First-year standing in College of Veterinary Medicine. AP-702-0-1218

AP 705. Gross Anatomy II. (6) II. Gross dissection of the horse and ruminant with comparative aspects of the pig, laboratory animals, and the chicken. Three hours lec. and nine hours lab a week. Pr.: AP 700. AP-705-1-1218

AP 710. Microscopic Anatomy I. (5) I. Origin, development, and microscopic structure and appearance of the cells and tissues of the animal body. Three hours lec. and six hours lab a week. Pr.: First-year standing in College of Veterinary Medicine. AP-710-1-1218

AP 715. Developmental Organology and Placentation of Domestic Animals. (2) II. Detailed organogenesis of the various body systems of the mammal correlating adult anatomy with its developmental basis: presentation of histology and anatomy of the various placentae of domestic animals. Two hours lec. a week. Pr.: BIOL 510, AP 700 or 725. AP-715-1-1218

AP 725. Gross and Microscopic Anatomy. (5) I. Survey of the gross and microscopic anatomy of the major organ systems using the dog as a model; variations from canine structure seen in domestic animals will be emphasized where significant. Pr.: BIOL 201 or equiv. AP-725-1-1219

AP 737. Veterinary Physiology I. (6) I. Functioning of animals, to include cellular physiology and metabolism, renal physiology and water balance, digestive physiology, and animal behavior, with emphasis on physiologic control mechanisms, interrelationships of body systems, and criteria for evaluating animal health. Four hours lec. and six hours lab a week. Pr.: BIOCH 521 or equiv. AP-737-1-1218

AP 740. Veterinary Orientation. (1) I. Lectures on introduction to veterinary medicine. One hour lec. a week. Pr.: First-year standing in College of Veterinary Medicine. AP-740-0-1218

AP 747. Veterinary Physiology II. (6) II. Functioning of the nervous, muscular, endocrine, cardiovascular, respiratory, and reproductive systems of animals with emphasis on physiologic control mechanisms, interrelationships of body systems, and criteria for evaluating animal health. Four hours lec. and six hours lab a week. Pr.: AP 737 or equiv. AP-747-1-1218

AP 757. Physiological Chemistry. (5) I. This course will consider control mechanisms that operate at the molecular, cellular, and organ levels, and integrate that information into a global picture of the physiological functioning of animal metabolism. Five hours of lec. a week. Pr.: BIOCH 521 or equiv. AP-757-0-1219

AP 770. Pharmacology. (5) I. The basic principles of pharmacology, the interaction of drugs and living systems which includes: the action of the drug upon the animal's systems, and the actions of the animal's body upon the drug. The application of these principles to the safe and efficacious use of drug regimens in veterinary medical and surgical patients. Four hours lec. and three hours lab a week. Pr.: AP 737 and 747 or equiv. AP-770-1-1218

AP 773. Bioinstrumentation Laboratory. (1) I, in even years. Practical experience with and evaluations of laboratory and clinical techniques related to electrodes, transducers, and monitoring equipment. Emphasis is on instrumentation for the respiratory, cardiovascular, and nervous systems. Three hours lab a week. Pr.: AP 747 or equiv., or conc. enrollment in EECE 773. AP-773-1-1219

AP 778. Respiratory Function in Health and Disease. (3) II, in even years. A comprehensive overview of normal respiratory physiology in mammals with clinical application to the recognition of obstructive, restrictive, infectious, and allergic diseases, and the management of mechanical ventilation and oxygen therapy. Pr.: AP 747 or equiv. AP-778-0-1219

Graduate credit

AP 801. Clinical Skills I. (1) II. Introduction to terminology and thought/organization for clinical veterinary medicine. Emphasis on problem identification from a clinical data base, and basic veterinary skills with animals. Same as SM 801. Pr.: First-year standing in College of Veterinary Medicine. Three hours of lab a week. AP-801-1-1218

AP 803. Seminar. (1) I, II, S. Designed primarily for graduate and senior students enrolled for graduate credit in physiology. Each student is required to give a report on some subject related to physiology. The course is intended to stimulate interest in research and evaluation of data. One hour a week. Pr.: Consent of staff. AP-803-0-1219

AP 825. Special Anatomy. (Var.) I, II, S. The gross and/or microscopic study of any system (or systems) of any domestic animal. Pr.: AP 700, or 710 or 725, or equiv. and consent of staff. AP-825-3-1219

AP 850. Anatomical Techniques. (1-2) I, in odd years, S. Pr.: Consent of staff. AP-850-3-1219

AP 855. Comparative Physiology. (3) II. Comparisons of physiological functions in the animal kingdom, including respiration, circulation, digestion, excretion, locomotion, and control. Pr.: BIOL 201, AP 530 or equiv. AP-855-0-1219

AP 860. Neuroscience. (2) I. An advanced multidisciplinary study of the central nervous system, including neurochemistry, neuropharmacology, neuroanatomy, neurophysiology, clinical neurology, and neurobehavioral science. Pr.: Consent of staff. AP-860-0-1219

AP 865. Physiologic Constituents of Body Fluids. (2) I, II, S. Analysis of body fluids, with application to specific and fundamental problems in veterinary medicine. One hour rec. and one to three hours lab a week. Pr.: AP 747 and consent of staff. AP-865-1-1219

AP 885. Environmental Toxicology. (2) II, in odd years. An advanced toxicology course concerned with the occurrence, biological effect, detection, and control of foreign chemicals in the environment. Pr.: Consent of staff. AP-885-0-1219

AP 886. Clinical Nutrition. (3) II. The clinical aspects of nutrition as it relates to (a) medical and surgical management of diseased and convalescent animals (therapeutic nutrition), and (b) programs of disease prevention of the common domestic species of food-producing, companion animals, pet birds, and exotic animals (nutritional preventive medicine). Same as ASI 886 and SM 886. Pr.: Third-year standing in College of Veterinary Medicine. AP-886-0-1218

AP 888. Advanced Neuroendocrinology. (2) II, in even years. A study of the chemical link between the brain and the endocrine system; the roles of brain peptides, neural pathways, and centrally acting drugs in the release of hormones; hormonal involvement in reproduction, aging, breast cancer, stress, etc.; a survey of the new and evolving concepts and techniques in neuroendocrinology. Two hours lec. a week. Pr.: AP 747 or BIOL 710 or equiv. AP-888-0-1219

AP 890. Problems in Pharmacology and Toxicology. (Var.) I, II, S. Individual investigation into the interactions of chemical compounds and living systems. Pr.: AP 770 or SM 895 or equiv. AP-890-4-1219

AP 891. Beef Nutritional Health and Feeding Management. (1) I, II. Veterinary medical aspects of nutrition and feeding management of beef cattle, with consideration of therapeutic nutrition related to clinical management of diseased and convalescent animals and nutritional programs of disease prevention in applied production. Pr.: AP 886 or equivalent. AP-891-0-1218

AP 892. Dairy Nutritional Health and Feeding Management. (1) I, II. Veterinary medical aspects of nutrition and feeding management of dairy cattle, with consideration of therapeutic nutrition related to clinical management of diseased and convalescent animals and nutritional programs of disease prevention in applied production. Pr.: AP 886 or equivalent. AP-892-0-1218

AP 893. Equine Nutritional Health and Feeding Management. (1) I, II. Veterinary medical aspects of nutrition and feeding management of horses, with consideration of therapeutic nutrition related to clinical management of diseased and convalescent animals and nutritional programs of disease prevention in applied production and horse care. Pr.: AP 886 or equivalent. AP-893-0-1218

AP 898. Master's Report. (2) I, II, S. Pr.: Consent of staff. AP-898-4-1219

AP 899. Research. (1-4) I, II, S. For graduate students in the field of anatomy or physiology working toward the M.S. degree. Pr.: Consent of staff. AP-899-4-1219

AP 900. Physiology and Pharmacology of the Hormones. (3) II. The internal secretions, their synthetic analogues, and use in research and therapy in domesticated animals will be evaluated. Two hours rec. and one to three hours lab a week. Pr.: AP 747 and consent of staff. AP-900-0-1219

AP 915. Histophysiology of Nutritional Deficiencies. (3) I, II, S. The study of changes occurring in tissues from nutritional deficiencies. Two hours rec. and three hours lab a week. Open to graduate students and veterinary students earning graduate credit. Pr.: Consent of staff. AP-915-0-1219

AP 925. Advanced Physiology. (3-5) I, II, S. The principles and techniques in the investigation of bioelectrical phenomena in relation to: (a) the physiology of the digestive organs, (b) myophysiology, (c) endocrinology, and (d) neurophysiology. Advanced physiological experiments will be conducted to provide an understanding of the applications of electronic equipment. Rec. and two three-hour labs a week. Pr.: AP 747 and consent of staff. AP-925-1-1219

AP 995. Problems in Physiology. (Var.) I, II, S. Special problem-involving techniques utilized in studying the function of various organ systems of the body. Pr.: Consent of instructor. AP-995-4-1219

AP 999. Research in Physiology. (1-6) I, II, S. For graduate students working toward the Ph.D. degree. Pr.: Consent of staff. AP-999-4-1219

Laboratory Medicine

W. E. Moore,* Head

Professors Bailie,* Keeton,* Minocha,* and Moore;* Associate Professors Chengappa* and Ridley;* Assistant Professors Elliott, McVey,* and Seedle; Instructor Hoffman; Emeriti: Professor Coles; Associate Professor Burroughs.

Courses in parasitology, bacteriology, virology, immunology, public health, and clinical pathology are offered for students enrolled in the veterinary medicine curriculum. Classroom instruction is by lecture, recitation, laboratory experience, seminar, and demonstrations. Third- and fourth-year veterinary medical students receive practical instruction in clinical laboratory procedures and the interpretation of results of laboratory tests.

Major work leading to the master of science and the doctor of philosophy is offered in the pathology/laboratory medicine interdepartmental group. (See description in Graduate School section.) Work at the graduate level includes advanced courses in clinical pathology, parasitology, microbiology, and public health.

Undergraduate and graduate credit

LM 645. Veterinary Mycology. (3) II, in even years. Detailed study of etiology of cutaneous, subcutaneous, and systemic fungus infections of animals, using histopathologic examinations and culture studies. Two hours rec. and three hours lab a week. Pr.: BIOL 198 and PA 710. LM-645-1-1219

LM 650. Fundamentals of Public Health and Food Safety. (3) I. Organization and function of food inspection services; principles of disease transmission; diseases transmitted to humans through the food chain. (Jointly with HRIMD 650.) Pr.: BIOL 198 and consent of staff. LM-650-0-1219

LM 705. Principles of Veterinary Immunology. (2) II. A study of host parasite interactions and immunologic mechanisms in health and disease of domestic animals. Two hours lec. a week. Pr.: AP 737. LM-705-1-1218

LM 712. Veterinary Bacteriology and Mycology. (5) I. Morphology, biology, and classification of pathogenic bacteria and fungi and their relation to the causes of disease. Three hours rec. and six hours lab a week. Pr.: LM 705 and BIOL 555. LM-712-1-1218

LM 715. Experimental Parasitology. (3) II, in even years. Planning, execution, analysis, and reporting of experiments in parasitology. Techniques concerning laboratory diagnosis of parasitisms, anthelmintic evaluation, life cycle experiments. Pr.: Consent of instructor and five credit hours of parasitology. LM-715-2-1219

LM 722. Veterinary Virology. (3) II. Morphology, biology, and classification of viruses and their relation to the causes of disease. Two hours rec. and three hours lab a week. Pr.: LM 712 or equiv. LM-722-1-1218

LM 753. Zoonoses and Preventive Medicine. (3) II. Consideration of the bacterial, viral, parasitic, and mycotic diseases shared by animals and man. The role of the veterinarian in wholesomeness and quality assurance of foods of animal origin including regulatory

requirements. Three hours lec. a week. Pr.: Third-year standing in College of Veterinary Medicine. LM-753-1-1218

LM 755. Principles and Methods of Epidemiology. (2) II. Use of ecologic and epidemiologic concepts in the study of diseases in populations; introduction to epidemiologic methods emphasizing problem solving; application to epidemiologic principles of disease control. Two lec. a week. Pr.: First-year standing in College of Veterinary Medicine. LM-755-1-1218

LM 775. Clinical Pathology. (3) II. Principles, application, and interpretation of clinical laboratory procedures, and experience with applicable techniques. Two hours lec. and three hours lab a week. Pr.: Second-year standing in College of Veterinary Medicine. LM-775-1-1218

LM 777. Laboratory Diagnosis. (1) I. A study of laboratory techniques in hematology, cytology, bacteriology, mycology, urology, and clinical chemistry as applied to the diagnosis of animal diseases. Three hours of lab a week. Pr.: Third-year standing in College of Veterinary Medicine. LM-777-1-1218

LM 793. Veterinary Parasitology. (5) I. Study of the helminth, arthropod, and protozoan parasites of domestic animals. Emphasis on disease prevention, signs and lesions of parasites, biological and medicinal controls, and relation of parasites to public health. Three hours lec. and six hours lab a week. Pr.: Second-year standing in College of Veterinary Medicine or consent of instructor. LM-793-1-1218

Graduate credit

LM 810. Problems in Laboratory Medicine. (1-3) I, II, S. Work is offered in parasitology, microbiology, clinical pathology, immunology, and epidemiology. For M.S. students and D.V.M. students. Not for thesis research. Pr.: Graduate or fourth-year standing in College of Veterinary Medicine. LM-810-3-1219

LM 820. Introduction to Research in Laboratory Medicine. (6) I, II, S. Introduction to the methodology to conduct research in laboratory medicine. A laboratory study to introduce the procedures to plan, conduct, and evaluate research in clinical pathology, microbiology, parasitology, immunology, or epidemiology. Students will develop a research proposal, including preliminary data, following the guidelines of a peer-reviewed granting agency. Pr.: Fourth-year standing in College of Veterinary Medicine. LM-820-1-1218

LM 821. Advanced Clinical Pathology Laboratory. (1) I, II, S. Practical training in advanced techniques of clinical chemistry and hematology used in a large clinical pathology laboratory. Pr.: LM 820. LM-821-1-1219

LM 825. Pathology of Body Fluids. (4) I, in even years. A detailed study of the alterations of the components of body fluids occurring in disease processes, and interpretations of these changes. Pr.: LM 775 and SM 870. LM-825-1-1219

LM 827. Veterinary Exfoliative Cytology. (2) I, in odd years. A study of the preparation, examination, and interpretation of aspiration, biopsies with emphasis on the recognition of inflammatory and neoplastic processes. Exfoliated material derived from various body fluids, tissues, and organs of the living clinic patient will serve as the basis of the study. One hour lec. and three hours lab a week. Pr.: LM 775 and PA 710. LM-827-1-1219

LM 830. Laboratory Medicine Seminar. (1) I, II, S. Primarily for graduate and veterinary students interested in infectious diseases. Each student is required to give reports on subjects related to infectious diseases. LM-830-0-1219

LM 835. Veterinary Epidemiology. (2) I, in even years. The scope and objectives of epidemiologic principles relative to infectious and noninfectious diseases transmissible from animals to man, and application of these principles by use of case investigations. Two hours lec. a week. Pr.: LM 753 and SM 870. LM-835-0-1219

LM 850. Advanced Veterinary Parasitology. (3) II, in odd years. Structure, life cycle, pathology, immunology, public health significance, diagnosis, and treatment of protozoan and metazoan parasites of veterinary significance. Pr.: Consent of instructor and five credit hours of parasitology. LM-850-2-1219

LM 851. Necropsy and Diagnostic Investigations. (2) I, II, S. Practical experiences in necropsy procedures (identification of gross pathologic changes and utilization of ancillary laboratory findings), public health and toxicology. Same as VD 851 and SM 851. Pr.: Fourth-year standing in College of Veterinary Medicine. LM-851-1-1218

LM 860. Advanced Veterinary Bacteriology. (3) II, in odd years. The detailed study of the classification, morphology, and biochemical and differential characteristics permitting identification of the bacteria of veterinary medical significance. One hour rec. and six hours lab a week. Pr.: LM 720, BIOL 610 or equiv. LM-860-1-1219

LM 865. Diagnostic Veterinary Virology. (3) I, in odd years. The study of viruses associated with diseases of veterinary medical significance with emphasis on diagnosis. Clinical observations, pathogenesis, lesions, epidemiology, immunity, and control will be considered. One hour rec. and six hours lab a week. Pr.: LM 720, BIOL 730 or equiv. LM-865-1-1219

LM 877. Advanced Laboratory Diagnosis. (1-2) I, II, S. Practical training in evaluation, interpretation, and written description of selected clinical pathology case materials. Course may be repeated by laboratory medicine or pathology majors for a maximum of four credit hours (M.S.) and eight credit hours (Ph.D.). Pr.: LM 777. LM-877-3-1219

LM 890. Veterinary Hematology. (3) II, in odd years. A detailed study of the blood of domestic animals. Emphasis is placed on the species variabilities. Three hours lec. a week. Pr.: LM 877. LM-890-1-1219

LM 899. Research in Laboratory Medicine. (1-6) I, II, S. Individual research in any of the fields of laboratory medicine. Pr.: Graduate standing. This work may form the basis for the M.S. thesis. LM-899-4-1219

LM 980. Problems in Laboratory Medicine. (1-6) I, II, S. Work is offered in parasitology, microbiology, and clinical pathology. Not for thesis research. For Ph.D. candidates. Pr.: Graduate standing. LM-980-4-1219

LM 999. Research in Laboratory Medicine. (Var.) I, II, S. Individual research in any of the fields of laboratory medicine. This work may form the basis for the Ph.D. dissertation. Pr.: Graduate standing. LM-999-4-1219

Pathology

J. E. Smith,* Head

Professors Dennis,* Kruckenberg,* Leipold,* and Smith;* Associate Professors Fenwick,* Mosier, and Schoning;* Assistant Professors Hall,* Leedle, and Oberst;* Emeritus: Professor Cook.

Basic courses in pathology are offered for students enrolled in the veterinary medicine curriculum. Instruction is by lecture, recitation, laboratory work, seminars, and demonstrations. Practical necropsy experience is provided for students as an adjunct to their pathology training and as an aid to disease diagnosis.

Major work leading to the degrees master of science and doctor of philosophy is offered.

Work at the graduate level includes advanced courses in general, systemic, developmental, cellular, molecular, laboratory, and wildlife pathology.

Courses in diseases of laboratory animals, wildlife, and fish are offered for non-veterinary undergraduate and graduate students.

Undergraduate and graduate credit

PA 500. Topics in Comparative Pathology. (1-3) I, II, S. Selected topics in diseases of laboratory animals, wildlife, and fish for nonveterinary students. Same as ASI 503. Pr.: BIOL 198 or equiv. PA-500-1-1218

PA 501. Diseases of Wildlife. (3) I. Infectious and noninfectious diseases of birds, furbearing animals, zoological animals, and fish with reference to methods of prevention and control. Three hours lec. a week. Pr.: BIOL 198 or equiv. PA-501-0-1218

PA 703. General Pathology. (5) I. Study of etiology, pathogenesis, lesions, and termination of processes of disease, including inflammation, necrosis, regeneration, oncology, and disturbances of metabolism, circulation, and growth. Three hours lec. and six hours lab a week. Pr.: Second-year standing in College of Veterinary Medicine. PA-703-1-1218

PA 710. Systemic Pathology. (5) II. Pathology of the organ systems of domestic animals including gross and microscopic study of lesions. Three hours lec. and six hours lab a week. Pr.: PA 703. PA-710-1-1218

Graduate credit

PA 826. Histopathology. (3) I, S. Introductory histopathological techniques course emphasizing routine and selected special techniques including light, darkfield, phase, and fluorescent microscopy. Practical experience will include preparing and embedding tissue blocks, cutting and mounting sections, hematoxylin and eosin staining, and selected special stains. Basic cellular changes in response to injury will be covered with emphasis on tissue and species differences. Principles of black and white, color, and Polaroid photomicrography will be taught, followed by practical experience in preparing slides in the histopathology laboratory. Pr.: PA 710 and consent of instructor. PA-826-1-1219

PA 845. Advanced Diagnostic Pathology. (3) I, S. Study of pathologic alterations of disease with emphasis on diagnostic characteristics. Pr.: PA 826 and consent of instructor. PA-845-1-1219

PA 850. Perinatal Pathology. (2) S. Study of placental and fetal lesions of congenital infections in domestic animals. Pr.: PA 845. PA-850-1-1219

PA 851. Advanced Principles of Pathology. (3) I. Advanced study of disease and its effects with emphasis on etiology and pathogenesis; morphologic change will be correlated with changes in chemical composition and function. Pr.: PA 710 and consent of instructor. PA-851-1-1219

PA 852. Surgical Pathology. (1-2) I, II, S. Practical experience in examining and processing surgical biopsy specimens and writing histopathological reports. Pr.: PA 845. PA-852-1-1219

PA 855. Oncology. (3) I, in odd years. Etiology, behavior, gross and microscopic characteristics, identification, and prognosis of tumors. Pr.: PA 845 and consent of staff. PA-855-1-1219

PA 857. Developmental Pathology. (2) I, in even years. A bridging course between embryology and pathology with emphasis on congenital defects in domestic animals. Pr.: PA 710 and consent of instructor. PA-857-1-1219

PA 858. Medical Genetics. (3) I, in odd years. Study of genetic diseases of domestic animals with emphasis on chromosomal observations, biochemical factors, and hereditary patterns in transmission. Pr.: PA 845 or equiv. PA-858-1-1219

PA 859. Laboratory Animal Science. (2) II. Consideration of the management and health of common species of laboratory animals. Two hours lec. a week. Pr.: Second-year standing in College of Veterinary Medicine. PA-859-0-1218

PA 860. Pathology of Diseases of Laboratory Animals, Fish, and Wildlife. (3) I, in even years. Pathology of diseases affecting laboratory animals, fish, and wildlife. Pr.: PA 845 and consent of instructor. PA-860-1-1219

PA 865. Advanced Topics in Comparative Pathology. (1-3) I, II, S. Selected topics to assist pathology majors in their areas of specialization. Pr.: PA 845. PA-865-1-1219

PA 870. Pathology Seminar. (1) I, II, S. Pr.: Consult department head. PA-870-0-1219

PA 880. Problems in Pathology. (1-6) I, II, S. Work is offered in pathology, pathological techniques, avian diseases, and diseases of laboratory animals, fish, and wildlife. Pr.: PA 710 and consent of instructor. PA-880-2-1219

PA 899. Research in Pathology. (1-6) I, II, S. Individual research in the pathology of animal disease. Pr.: PA 710 and VD 849. This work may form the basis for the master's thesis and the Ph.D. dissertation. PA-899-4-1219

PA 947. Advanced Systemic Pathology I. (5) I, in odd years. Study of etiology, pathogenesis, gross and microscopic characteristics, and systemic effects of diseases of cardiovascular, respiratory, gastrointestinal, urinary, and endocrine systems. Pr.: PA 845 and 851, plus four credits of 985. PA-947-1-1219

PA 950. Advanced Systemic Pathology II. (5) II, in odd years. Study of etiology, pathogenesis, gross and microscopic characteristics, and systemic effects of diseases of the skin, of musculoskeletal, genital, and nervous systems, and of special senses. Pr.: PA 947. PA-950-1-1219

PA 965. Cellular and Molecular Pathology. (4) II. Biochemistry of the injured cell, relationship of intracellular parasitism to cellular metabolism, metabolic and genetic basis of inherited disease. Pr.: Three hours credit in biochemistry or physiological chemistry and consent of instructor. PA-965-0-1219

PA 970. Pathology Seminar. (1) I, II, S. Pr.: Consult department head. PA-970-0-1219

PA 980. Problem in Pathology. (1-6) I, II, S. Work is offered in pathology, pathological techniques, avian diseases, and diseases of laboratory animals, fish, and wildlife. Pr.: PA 710 and consent of instructor. PA-980-2-1219

PA 985. Necropsy Diagnosis. (1-3) I, II, S. Necropsy procedures and diagnosis. May be repeated each semester by pathology majors with a maximum of 10 credit hours. Pr.: PA 845 or consent of staff. PA-985-3-1219

PA 999. Research in Pathology. (1-6) I, II, S. Individual research in the pathology of animal disease. Pr.: PA 710 and VD 849. This work may form the basis for the Ph.D. dissertation. PA-999-4-1219

Surgery and Medicine

J. R. Gillespie,* Head

Professors Anderson,* Brightman,* Edwards,* Gillespie,* Mosier,* Oehme,* Schoneweis,* Spire,* and Vestweber;* Regents Distinguished Professor Leith;* Associate Professors Beeman, Carpenter, R. DeBowes,* Gabbert, Layton, Pickrell,* Schneider, and Williams;* Assistant Professors Brandt, Bruyette, Chalman, Cowan, Cox, Coyne, L. DeBowes, Douglass, Fingland, Fortney, Gaughan, Godshalk, Hodgson, McMurphy, Roush, Saint Jean; Emeriti: Professors Blauch, Butler, Carnahan, Frick, Guffy, Noordsy, Railsback, and Taussig.

The KSU-Veterinary Medical Hospital (KSU-VMH) is equipped for diagnosis and treatment of animal disease and for instruction of veterinary students, house officers, and post-graduate veterinarians.

The hospital has a capacity of 82 large animal patients and 150 small animal patients. Clinical faculty accompanied by students provide clinical veterinary service on local and regional livestock farms. In addition to caring for sick animals, they provide preventative medical services and consultation on production medicine and management. KSU-VMH provides full veterinary service for clients and referring veterinarians from Kansas and Nebraska, and the educational programs are conducted in conjunction with the University of Nebraska Veterinary Educational Center at Clay Center, Nebraska.

Fourth-year students are active participants in the hospital and clinical services. Students are regularly assigned on a rotation basis during the year to various specialists on the clinical and pathology staffs.

The department presents courses in medicine, surgery, toxicology, obstetrics, theriogenology, and other clinical specialties to veterinary students and post-DVM trainees.

Opportunities leading to the master of science degree are offered. Prerequisite to graduate work in the department is the completion of an approved four-year curriculum in veterinary medicine.

Excellent library facilities, physical plant equipment, and case loads are available to support research in surgery and medicine.

Courses in surgery Undergraduate credit

SM 235. Principles of Animal Disease Control. (3) II. A study of the factors that influence animal health and disease control. For students majoring in agriculture and other fields. Three hours lec. a week. Same as ASI 235. Pr.: ASI 101 or equiv., AP 530, and sophomore standing. SM-235-0-1219

Graduate credit

SM 702. Animal Nutrition and Diet Formulation. (2) I. Application of basic nutrition principles, diet formulation, and diet adequacy for livestock, poultry, pets, and exotic animals. Includes practical feeding problems encountered by producer and veterinarians. Same as AP 702 and ASI 702. Pr.: First-year standing in College of Veterinary Medicine. SM-702-0-1218

SM 741. Ethics and Jurisprudence. (1) II. Socratic ethics are discussed along with the American Veterinary Medical Association's Code of Ethics and practical situations with a fundamental ethical basis. The Kansas Practice Act is explored as an example of governance in veterinary medicine. The role of animals in humans' wellbeing is addressed along with the philosophy of animal welfare. The law and the practicing veterinarian are discussed with emphasis upon professional liability. Pr.: First-year standing of College of Veterinary Medicine. SM-741-0-1218

SM 778. Respiratory Function in Health and Disease. (3) II, in even years. A comprehensive overview of normal respiratory physiology in mammals, with clinical applications to the recognition of obstructive, restrictive, infectious, and allergic diseases, and the management of mechanical ventilation and oxygen therapy. Pr.: AP 747 or equiv. SM-778-0-1219

SM 801. Clinical Skills I. (1) II. Introduction to terminology and thought/organization for clinical veterinary medicine. Emphasis on problem identification from a clinical data base, and basic veterinary skills with animals. Same as AP 801. Pr.: First-year standing in the College of Veterinary Medicine. Three hours lab a week. SM-801-1-1218

SM 802. Clinical Skills II. (1) II. Continuation of Clinical Skills I. Introduction to clinical cases, data base accumulation, problem identification, problem solving, and basic veterinary skills with animals. Pr.: Second-year standing in the College of Veterinary Medicine. Three hours lab a week. SM-802-1-1218

SM 803. Clinical Skills III. (1) II. Laboratory instruction and experience in hand skills for physical examination and for veterinary therapy. Pr.: Third-year standing in the College of Veterinary Medicine. Three hours lab a week. SM-803-1-1218

SM 805. Surgery I. (3) II. Principles of surgery and consideration of instrumentation, the surgical suite, preparation and monitoring of the patient. Three hours lec. a week. Pr.: Second-year standing in College of Veterinary Medicine. SM-805-0-1218

SM 809. Clinical Small Animal Surgery. (6) I, II. S. This course is designed to train veterinary students in the diagnosis and treatment of small animal surgical diseases through participation in clinical service in the Veterinary Teaching Hospital. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-809-1-1218

SM 810. Basic Equine Medicine and Surgery Clinics. (6) I, II, S. This course will offer the veterinary student a general exposure to clinical problems and problem-solving of medical and surgical diseases of horses. The student will be responsible for and involved in the diagnosis, treatment, and nursing care of equine patients affected by a variety of conditions. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-810-1-1218

SM 811. Large Animal Surgery. (4) II. Lectures and demonstrations of food animal and equine surgical patients, including participation in surgical laboratories. Three hours lec. and three hours lab a week. Pr.: Third-year standing in the College of Veterinary Medicine. SM-811-0-1218

SM 812. Research in Medicine. (1-6) I, II, S. An attempted solution of some of the medical and parasitological problems confronting the practitioner of veterinary medicine. Pr.: Consent of staff. SM-812-4-1219

SM 813. Agricultural Clinical Practices. (6) I, II, S. A study of the role of the veterinarian in the practice of clinical medicine in livestock production units. Students will work under faculty supervision in local practice and in-hospital situations. Pr.: Fourth-year standing in the College of Veterinary Medicine or consent of the instructor. SM-813-1-1218

SM 814. Small Animal Surgery. (3) I. Lectures and demonstrations of small animal surgical patients, including participation in surgical laboratories. Two hours lec. and three hours lab a week. Pr.: Third-year standing in College of Veterinary Medicine. SM-814-0-1218

SM 815. Veterinary Diagnostic Imaging I. (3) I, II, S. Radiographic, ultrasonographic, and nuclear imaging in the clinical setting, with emphasis on making/identifying images of diagnostic quality, interpretation, indications for imaging, and radiation safety. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-815-1-1219

SM 816. Clinical Anesthesia. (3) I, II, S. Practical instruction in the skills and techniques used in the practice of clinical veterinary anesthesia of both large and small animals. May be repeated once. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-816-1-1218

SM 817. Small Animal Medicine. (6) I, II, S. The study of preventive medicine, internal medicine, and special medicine in the setting of the veterinary medical center. Problem solving, differential diagnosis, diagnostic procedures, and medical treatment of small animal disease will be emphasized using veterinary patients. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-817-1-1218

SM 818. Clinical Externship and/or Programmed Study. (3-9) I, II, S. Practical experience with the daily operation of veterinary practice, insights into the role of veterinarians in private industry, and/or opportunity to become involved in specialty areas relating to veterinary medicine in other academic institutions. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-818-2-1218

SM 819. Ophthalmology. (3) I, II, S. The study of the surgery and medical diagnosis and treatment of ocular disease in animals in the setting of the veterinary medical center. Problem solving, differential diagnosis, diagnostic procedures, and medical and surgical therapy will be emphasized using veterinary patients. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-819-1-1218

SM 820. Theriogenology. (3) I. Consideration of prevention, diagnosis, and treatment of disease, and maintenance of health and productivity of the genital tract of domestic animals. Three hours lec. a week. Pr.: Third-year standing in College of Veterinary Medicine. SM-820-0-1218

SM 821. Companion Animal Medicine. (4) II. A study of the etiology, clinical signs, diagnosis, treatment, and control of infectious or contagious diseases which affect horses, dogs, and cats. Four hours lec. a week. Pr.: Third-year standing in College of Veterinary Medicine. SM-821-0-1218

SM 822. Breeding Diseases. (1-5) I, II, S. Advanced studies of the breeding diseases of domestic animals. Pr.: D.V.M. degree or consent of staff. SM-822-3-1219

SM 823. Advanced Small Animal Surgery. (3 or 6) I, II, S. This course provides veterinary students an opportunity for advanced training in the diagnosis and treatment of small animal surgical diseases through participation in clinical service in the Veterinary Teaching Hospital. Pr.: Fourth-year standing in the College of Veterinary Medicine and SM 809. SM-823-1-1218

SM 824. Food Animal Medicine. (4) I. A study of the etiology, clinical signs, diagnosis, treatment, and control of infectious or contagious disease conditions which affect cattle, swine, and sheep. Four hours lec. a week. Pr.: Third-year standing in the College of Veterinary Medicine. SM-824-0-1218

SM 825. Advanced Equine Medicine and Surgery Clinic. (3 or 6) I, II, S. This course provides an opportunity for students to pursue equine clinical studies in depth and assume substantial responsibility for care of hospitalized cases. Students will present a seminar on a medicine or surgical subspecialty and pursue a special problem. Pr.: SM 810. SM-825-1-1218

SM 826. Systemic Medicine I. (1-3) I, II, S. Study of the medical aspects of diseases of the urinary, nervous, and integumentary systems, and special senses. Pr.: D.V.M. degree or consent of department head. SM-826-3-1219

SM 827. Systemic Medicine II. (1-3) I, II, S. Study of the medical aspects of diseases of the cardiovascular, respiratory, musculoskeletal, and endocrine systems. Pr.: D.V.M. or consent of department head. SM-827-3-1219

SM 828. Advanced Small Animal Medicine. (3-6) I, II, S. Advanced topics in preventive medicine, kennel medicine, greyhound medicine, internal medicine, dermatology, neurology, and cardiology. The student will be required to participate in a special problem with a written report. Pr.: SM 817. SM-828-1-1218

SM 829. Veterinary Diagnostic Imaging II. (3) I, II, S. Student will make presentations on topics relevant to diagnostic imaging, and receive advanced training on interpretation, techniques, and safety, and will have opportunity for advanced involvement in imaging procedures. Pr.: SM 815. SM-829-1-1218

SM 830. Medicine I. (4) II. Consideration of medical and pathophysiologic aspects of diseases affecting the musculoskeletal, respiratory, cardiovascular, special senses, and nervous systems. Four hours lec. a week. Pr.: Second-year standing in the College of Veterinary Medicine. SM-830-0-1218

SM 831. Topics in Anesthesia. (1) II. Seminars and assigned reading which will emphasize the application of both the basic sciences (particularly physiology and pharmacology) and the results of recent veterinary and medical research to the practice of veterinary anesthesia. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-831-0-1218

SM 832. Surgical Techniques. (1-6) I, S. The study and application of developments in surgical techniques. Pr.: D.V.M. degree or consent of department head. SM-832-3-1219

SM 833. Topics in Equine Internal Medicine. (1) I, II. Selected topics in equine internal medicine. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-833-0-1218

SM 834. Advanced Topics in Equine Surgery. (1) I, II, S. This course will present an in-depth experience in the pathophysiology, diagnosis, and surgical treatment of selected complex surgical diseases of horses. Pr.: SM 825. SM-834-1-1218

SM 835. Emergency Medicine. (1) I, II, S. A study of the advanced medical/surgical therapy and diagnosis of the most commonly encountered emergencies affecting animals. The use of problem solving in cases of trauma, metabolic, gastrointestinal, reproductive, neurological, and ophthalmic emergencies will be emphasized. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-835-1-1218

SM 836. Advanced Ophthalmology. (1) I, II, S. The advanced study of the pathophysiology, pharmacology, and neuroscience of ophthalmology using a problem-solving approach to evaluate clinical cases. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-836-1-1218

SM 837. Interpretation of Radiologic Studies of Body Systems. (3) I, in odd years. The rationale of radiologic procedures are studied and the interpretation of radiographs of body systems emphasized. Pr.: D.V.M. degree or consent of department head prior to registration. SM-837-0-1219

SM 838. Advanced Toxicology. (3-6) I, II, S. An advanced course in toxicology stressing independent problem-solving utilizing data bases and technical resources to identify toxicological concerns, to define the problem, to consider possible remedial alternatives, and to select and implement the most appropriate management and recommendations for correction and future prevention. May be repeated once per student. Pr.: Fourth-year standing in the College of Veterinary Medicine, or graduate students in toxicology. SM-838-0-1218

SM 839. Small Animal Clinical and Critical Care Nutrition. (1) I, II, S. The principles of nutrition as it relates to specific diseases and in the management of critically ill small animal patients. Emphasis on case histories and laboratory experience in diet formulation and internal feeding techniques. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-839-1-1218

SM 840. Radiology. (3) II. The theory and principles of x-rays, production and interpretation of radiographs and exposure factors, special radiographic methods, film storage and handling, processing, safety measures, and biologic effects of radiation. Three hours lec. a week. Pr.: Third-year standing in the College of Veterinary Medicine. SM-840-1-1218

SM 841. Advanced Systemic Bovine Medicine. (1) I. A problem-orientated study of the medical and pathological aspects of diseases of the respiratory, nervous, digestive, musculoskeletal, cardiovascular, metabolic, integumentary, and urogenital systems of the bovine. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-841-0-1218

SM 842. Comparative Gastroenterology. (3) I, in odd years. A comparative medical study of the etiopathogenesis, diagnostic criteria, and treatment of gastroenteric disorders in the canine, equine, porcine, and bovine species. Comparable disorders in humans are discussed. Pr.: D.V.M. degree. SM-842-3-1219

SM 843. Advanced Agricultural Clinical Practices. (3-6) I, II, S. Advanced studies in the practice of veterinary medicine and surgery emphasizing the application of problem-solving methodology in livestock health and production programs. Pr.: SM 813 or consent of the instructor. SM-843-1-1218

SM 844. Commercial Pet Production. (1) II. A comprehensive overview of the commercial pet industry emphasizing herd-health management. The interrelationships of housing, nutrition, and preventative medicine in small animal production medicine will be discussed and observed on field trips. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-844-1-1218

SM 845. Swine Production Medicine. (2) I, II, S. A study of the interactions of infectious agents, nutrition, and environment in infectious and non-infectious swine problems in commercial swine production. Pr.: Fourth-year standing in the College of Veterinary Medicine or consent of instructor. SM-845-1-1218

SM 846. Advanced Small Animal Orthopedics. (1) II. Seminars will be given in advanced problem-solving in small animal orthopedics. Problem identification and resolution derived from application of basic principles and reconstruction concepts will be emphasized. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-846-0-1218

SM 847. Chemical and Food Safety/Environmental Health. (1) I, II, S. A case presentation/problem-oriented discussion of chemical use and circumstances that impact upon health hazards, risks to food safety, and the compromising of environmental health. Recognition of risks associated with chemical use, evaluating toxicity in given situations, and determination of appropriate management, control, and future

prevention is stressed. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-847-0-1218

SM 848. Research in Toxicology. (2-3) I, II, S. This course provides research opportunities in toxicology through formulation of a research proposal, performance of an investigation, and documentation of results in publishable format. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-848-1-1218

SM 849. Production Medicine of Small Ruminants. (1) I. Lectures and field trips emphasizing production medicine of small ruminants. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-849-1-1218

SM 850. Medicine II. (4) I. Consideration of the medical and pathophysiological aspects of diseases affecting the gastrointestinal, endocrine, urinary, integumentary, and hemic and lymphatic systems. Four hours lec. a week. Pr.: Third-year standing in the College of Veterinary Medicine. SM-850-0-1218

SM 851. Necropsy and Diagnostic Investigations. (2) I, II, S. Practical experiences in necropsy procedures, (identification of gross pathologic changes and utilization of ancillary laboratory findings), public health and toxicology. Same as LM 851 and VD 851. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-851-1-1218

SM 853. Advanced Equine Theriogenology. (1) I, II, S. An in-depth exposure to methods of maximizing reproductive efficiency in the mare and the stallion. Advanced equine reproductive physiology, diagnostics, and therapeutics are emphasized. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-853-1-1218

SM 859. Beef Production Medicine. (1) I. A study of the development, initiation, maintenance, and monitoring of production-oriented health management delivery systems in beef cattle operations. Pr.: Fourth-year standing in the College of Veterinary Medicine or consent of the instructor. SM-859-0-1218

SM 860. UNL-KSU Food Animal Production Medicine. (1) I, II, S. A study of the role and responsibility of the veterinarian in the practice of clinical veterinary medicine in livestock production units. Students will work under University of Nebraska-Lincoln and KSU faculty supervision at the USDA Meat Animal Research Center with swine, sheep, and beef cattle. Pr.: Fourth-year standing in the College of Veterinary Medicine. SM-860-2-1218

SM 872. Organ Transplantation. (3) II, in odd years. The study of transplantation of tissues and associated problems. Pr.: D.V.M. degree or consent of department head. SM-872-3-1219

SM 875. Production Medicine. (2) II. The role of the veterinarian in livestock production units, including interactions with producers, nutritionists, investors, and others in decision analysis. Emphasis is on the professional service that veterinarians provide to beef feedlot, cow/calf, swine, dairy, and dog kennel segments of animal production. Pr.: Third-year standing in the College of Veterinary Medicine. SM-875-0-1218

SM 877. Orthopedic Surgery. (4) II, in even years. Fundamentals, theory, and practice concerning genetic, metabolic, infectious, neoplastic, and traumatic diseases of bones and joints. Pr.: D.V.M. degree or consent of department head. SM-877-3-1219

SM 882. Clinical Science Seminar. (1) I, II, S. A required seminar for all house officers and graduate students in the Department of Surgery and Medicine. One-hour conference weekly. May re-enroll for total maximum of two credits. Pr.: Consent of department head. SM-882-0-1219

SM 885. Principles of Veterinary Internal Medicine. (3) II. An intermediate course presenting the key unifying concepts of veterinary internal medicine. Each concept is introduced as a symptomatic entity ranging across the major domestic species. Interactions between body systems, the diagnostic process, and the development of rational treatments are emphasized. Pr.: D.V.M. degree. SM-885-0-1219

SM 886. Clinical Nutrition. (3) II. The clinical aspects of nutrition as it relates to (a) medical and surgical management of diseased and convalescent animals (therapeutic nutrition), and (b) programs of disease prevention of the common domestic species of food-producing, companion animals, pet birds, and exotic animals (nutritional preventative medicines). Same as ASI 886 and AP 886. Pr.: Third-year standing in the College of Veterinary Medicine. SM-886-0-1218

SM 887. Problems in Medicine or Surgery. (1-3) I, II, S. The course provides for the study of medical or surgical problems. The student, in conference with the major professor, outlines the methodology and procedures, conducts the study, and prepares a detailed report. Pr.: D.V.M. SM-887-3-1219

SM 892. Toxins in the Biological System. (2) I, in odd years. An advanced toxicology course concerned with the cellular and subcellular effects of various groups of toxins on the intact animal organism. Pr.: Biochemistry, organic chemistry, pharmacology, or consent of instructor. SM-892-3-1219

SM 895. Toxicology. (3) I. Effects of harmful substances on the animal body. Emphasis placed on toxicologic principles and management of the poisoned patient. Three hours lec. a week plus three one- to three-hour field trips. Pr.: Third-year standing in the College of Veterinary Medicine, BIOCH 521, and AP 747 or equiv. SM-895-0-1218

SM 897. Current Topics in Toxicology. (2) II, in even years and summers. An advanced toxicology course providing in-depth examination of toxicological areas of current relevance to and/or controversy on mammalian health. Specific topics will change from semester to semester. Students in Ph.D. programs may repeat the course. Pr.: BIOCH 521 and AP 747. SM-897-3-1219

SM 899. Research in Surgery. (1-6) I, II, S. Solving problems confronting the veterinary surgeon. Pr.: AP 700, 705, 720; SM 805, 811, 814. Offered especially for graduates in veterinary medicine. SM-899-4-1219

Veterinary Diagnosis

M. W. Vorhies, Head

Professors Kennedy,* Phillips,* Strafass,* and Vorhies; Assistant Professors Briggs, Cole, Frank, and Veatch; Emeriti: Professor Anthony; Associate Professors Gray and Milleret.

The department's academic responsibilities include teaching diagnostic necropsy and laboratory procedures to fourth-year professional students and graduate students.

The department serves the livestock and companion animal industry by conducting investigational procedures to identify animal disease problems, by developing research projects related to disease pathogenesis and diagnosis, and by teaching professional and graduate students in the College of Veterinary Medicine.

The department's diagnostic laboratory is nationally recognized as fully accredited with capabilities in all areas of diagnostic medicine by A.A.V.L.D.

Graduate credit

VD 847. Avian Diseases. (3) 1. The prevention, diagnosis, and treatment of avian diseases. Three hours lec. a week. Pr.: Third-year standing in the College of Veterinary Medicine. VD-847-0-1218

VD 848. Avian Pathology. (2) I, in even years. Study of etiology, pathogenesis, and gross and microscopic characteristics of avian diseases. Pr.: VD 847 or consent of instructor. VD-848-1-1219

VD 849. Pathologic Technique and Diagnosis. (3) I, II. Practical experience in mammalian necropsy, avian necropsy, histologic techniques, and diagnostic lab procedures. Pr.: PA 710 and/or consent of staff. VD-849-1-1219

VD 851. Necropsy and Diagnostic Investigations. (2) I, II, S. Practical experience in necropsy procedures and laboratory findings. Same as SM 851, LM 851. Pr.: Fourth-year standing in the College of Veterinary Medicine. VD-851-1-1218

VD 985. Necropsy Diagnosis. (1-3) I, II, S. Necropsy procedures and diagnosis. May be repeated each semester by pathology majors with a maximum of six credit hours. Pr.: PA 845 or consent of staff. VD-985-3-1219

Intercollegiate Athletics

Steve Miller, Head and Athletic Director

Coaches Bietau, Bunker, Capriotti, Clark, Kruger, Nelson, and Snyder; Assistant Coaches Anderson, Buchanan, Coe, Cope, Denardo, Gensing, Griffin, Grogan, Hall, Kleinau, Kubala, Latina, McCullum, Miller, Morgan, Nelson, Palmieri, Quartaro, Ramsey, Rovelto, Stoops, and Stuart; Sports Information Director Mossman; Sports Information Assistant Directors Boyle and Klintworth; Video Director Burge; Trainers Brace, Cramer, Harklau, and Roschke; Administrative Staff Adolph, Andrews, Bonjour, Brandt, Epps, Greene, Kowalczyk, Lundberg, McGowan, McMillen, Peterson, Renfro, Schemmel, Switzer, and Weaver.

Kansas State University is a member of the Big Eight Conference and through that affiliation competes with the University of Colorado, Iowa State University, the University of Kansas, the University of Nebraska, the University of Missouri, the University of Oklahoma, and Oklahoma State University.

Intercollegiate competition is open to all students and is coached by staff members who are specialists in their fields.

The men's intercollegiate program competes in football, basketball, baseball, track (indoor and outdoor), cross country, and golf. The women's program offers competition in cross country, volleyball, basketball, track (indoor and outdoor), tennis, and golf.

Courses

ATHM 101. Varsity Baseball. (1) I, II. Pr.: Consent of instructor. ATHM-101-5-0899

ATHM 102. Varsity Basketball. (1) I, II. Pr.: Consent of instructor. ATHM-102-5-0899

ATHM 103. Varsity Track. (1) I, II. Pr.: Consent of instructor. ATHM-103-5-0899

ATHM 104. Varsity Football. (1) I, II. Pr.: Consent of instructor. ATHM-104-5-0899

ATHM 105. Varsity Golf. (1) I, II. Pr.: Consent of instructor. ATHM-105-5-0899

ATHW 150. Intercollegiate Basketball. (1) I, II. Pr.: Consent of instructor. ATHW-150-5-0899

ATHW 152. Intercollegiate Track. (1) I, II. Pr.: Consent of instructor. ATHW-152-5-0899

ATHW 154. Intercollegiate Tennis. (1) II. Pr.: Consent of instructor. ATHW-154-5-0899

ATHW 155. Intercollegiate Volleyball. (1) I. Pr.: Consent of instructor. ATHW-155-5-0899

ATHW 157. Intercollegiate Golf. (1) I, II. Pr.: Consent of instructor. ATHW-157-5-0899

Research Resources

Library System

Brice Hobrock, Dean of Libraries
Farrell Library
532-6516

The University Libraries provide research library support for the educational, research, extension, and public services objectives of Kansas State University. The Libraries' staff is responsible for acquiring, developing, maintaining, and preserving collections of library materials suitable to the total program requirements of the University. Librarians at KSU are dedicated to organizing, promoting, and interpreting the collections for the University community and the citizens of Kansas.

Farrell Library, named after Kansas State University's eighth president, Francis David Farrell, is the central unit of the University library system. It is supplemented by four specialized subject libraries: architecture and design (Seaton Hall), chemistry (Willard Hall), math/physics (Cardwell Hall), and veterinary medical (Veterinary Medical Teaching Building).

The University Libraries contain over one million volumes and that number is increasing at an annual rate of about 40,000 volumes. Current journal and serials subscriptions total 7,649. In addition to the volumes cataloged according to the Library of Congress Classification, the Libraries contain a document depository collection of United States government publications that numbers nearly 600,000; about 100,000 maps; a complete archival collection of ERIC (Educational Resources Information Center) documents; a curriculum materials collection; and more than two million pieces of microforms. Audiovisual materials number approximately 47,000 items and include sound recordings, tapes, slides, and printed music scores. A collection of more than 200 newspapers is maintained from Kansas communities, major U.S. cities, and other countries.

Specialized collections and the University archives contain a variety of old, rare, and unusual books, manuscripts, and other materials that must be protected and accorded special treatment because of their value and condition. The archives offer an assortment of published and unpublished material, including photographs, documenting the history of Kansas State

University. The Minorities Resource and Research Center is a special collection of materials by and about blacks, Hispanics, and native Americans. The juvenile literature collection numbers about 10,000 volumes of children's books and is used primarily by students in teacher education.

The reference/information services department, located on the first floor of Farrell Library, is the service center of the system. It provides traditional reference service as well as computerized information retrieval from more than 200 data bases. This department is staffed by a group of librarians who are available to help students, faculty, and others find the information they need. The card catalogs and online terminals are located in this department.

Other areas of Farrell Library containing collections and providing services are the audio-visual/music unit, reserves, the microforms/periodicals reading room, government documents department, and the copy center. Resources on Developing Countries provide research information about developing countries in support of KSU international agricultural programs. A postharvest documentation service, supported by a USAID grant, provides information to developing nations on postharvest cereal and legume systems. Other departments include acquisitions, cataloging, binding, circulation, and administration.

Library instructional services, on the second floor of Farrell, help students acquire and develop skills in using the library through orientation tours, subject presentations, and a class for credit.

To take advantage of the library resources in the region, the Regent Libraries, cooperatively, operate a courier service twice a week east to Topeka, Lawrence, and Kansas City and south to Emporia and Wichita. In addition to collections at the libraries of Regents' institutions, the vast scientific holdings of the Linda Hall Library in Kansas City are available. The six state-supported institutions of higher education belong to a computerized national network for cataloging and interlibrary loan. They also permit direct borrowing by students and faculty. The libraries are a member of the Kansas Information Circuit, a network of the larger public and system libraries of the state.

Computing and Telecommunications Activities

Tom L. Gallagher, Director
10 Cardwell Hall
532-6311

Computing and telecommunications services for instruction and instructional support activities in research, administration, and public service are provided by Computing and Telecommunications Activities. These services also are available to other public and private educational institutions. Statewide computing efforts are fostered among the Board of Regents' many educational institutions through the KANSAS REgents NETwork (KARENET). Access to the National Science Foundation supercomputers can be gained through MIDnet, a regional 56 kb, TCP/IP network. Electronic mail service to other research and educational institutions throughout the world is available through BITMAIL. Microcomputers and terminals are connected to more than 25 computing systems on campus through an Equinox data switch. Dial-out and dial-in facilities are also provided through the data switch.

Advisory committees for academic, administrative, and telecommunications activities interact with the Executive Computing Council to recommend policies, services, and principal equipment to support computing and telecommunications.

Academic services

The instructional and research activities of the faculty, staff, and students are supported by academic user services, technical services, and operations services. The professional staff provides assistance in the use of hardware and software. Manuals, text, publications, the *Newsletter*, and other materials are available in the User Information Center in Cardwell Hall. In addition, manual racks are maintained in several locations on campus.

Personal accounts are available to all students, staff, and faculty. These accounts are non-transferable and are not to be used for monetary gain or for business activities. All computer users are expected to follow normal standards of ethics and polite conduct in their use of the computing resources.

Programming languages on the system include FORTRAN, COBOL, PL/1, SPITBOL, PASCAL, and Assembler. Generalized applications packages for mathematical statistical and simulation tasks are available using SPSS, SAS, BMD, IMSL, GPSS/H, MPSIII, LISREL, and CSMP. The Conversational Monitor System (CMS) is the interactive system that supports communications terminals using BASIC, SCRIPT, VS Assembler, GPSS/H, FORTRAN 77, PASCAL, PL/1, COBOL, SAS, SPSS, SQL/DS, WATFOR 77, and WATFIV. Noncredit courses are taught periodically to assist users to utilize more fully the capabilities of the computer and its program environment.

Administrative services

The administrative community of the University is supported by administrative user services, technical services, and computer operations services. Services consist of application systems, programming, operational, and data entry functions provided by the staff on a closed-shop basis. Some of the computerized processing services performed directly for the student community are registration, personnel changes, payrolls, and services for student health, alumni/foundation system, accounting, affirmative action, financial assistance housing, and the K-State Union.

COBOL is the principal programming language. On-line transactions are processed using ADDS/ONLINE with the IDMS/R data base. A fourth-generation language, FOCUS, is available to manipulate and manage custom reports and data.

Operations services

The mainframe computer is an IBM 3084Q (27 MIPS) with 96 megabytes of memory and 48 input/output channels. This machine is shared between administrative and academic uses. Supporting peripheral equipment includes tape drives, disk drives, line printers, page printer, interactive terminals, color graphics terminals, remote-job-entry stations, and an incremental plotter. Many remote computing laboratories on campus provide interactive access to users.

A UNIX operating system server is accessed through the campus backbone ethernet network.

Microcomputer laboratories located in Seaton, Fairchild, Justin, Cardwell, and Dickens Halls have IBM-compatible microcomputers available for general use throughout the year. Several departments and colleges provide specialized microcomputer laboratories for the exclusive use of their students.

Telecommunications services

Telecommunications provides the voice, data, and video transmission capabilities for the University. The entire campus has been rewired since 1985. Fiber optic cables are also run to all the academic buildings of the campus based upon the anticipated level of communication.

An AT&T System 85 switch was installed as a part of the new system in 1985. There are more than 5,400 telephone instruments that are connected within the Kansas State University system. Approximately 1,800 lines are in the residence halls and 1,800 lines serve the remainder of the campus. There are approximately 7,000 jacks which have been installed throughout the University.

Long-distance service is provided using the State's intercity KANS-A-N network along with facilities provided by Southwestern Bell and AT&T. The System 85 automatically controls the routing of calls. Long-distance service for the residence halls is provided using these facilities as well. Each of the students in the residence halls has an authorization code in order to facilitate the identification of calls and proper billing. Authorization codes for other campus users are available if circumstances warrant their use.

Particle Accelerators: J. R. Macdonald Laboratory

Patrick Richard, Director
106 Cardwell Hall
532-6783

Kansas State University, in cooperation with the U.S. Department of Energy, operates a major facility for the production and the acceleration of atomic ions. There are several accelerators, including a 6 MV tandem Van de Graaff, associated with this facility. The laboratory has recently built a superconducting LINAC booster accelerator which will give energies of over 100 MeV for some ions. Beams from the tandem plus booster will be available in 1990. A liquid He production plant has been installed to provide up to 500 watts of cryogenic cooling for the LINAC.

A new type of ion source called CRYEBIS has been developed and is producing high-charge, low-energy ions. At the present time it is the only ion source in the U.S. capable of producing bare argon ions. A network of four MICRO-VAX work stations is available for the accumulation and analysis of data.

The J. R. Macdonald Laboratory is a national atomic physics user facility. The KSU faculty, together with a professional staff and graduate students, maintains an active research program that addresses problems in atomic interactions and spectroscopy. For further information concerning this facility, write to the director, J. R. Macdonald Laboratory, Department of Physics, 106 Cardwell Hall, Manhattan, Kansas 66506-2604.

Nuclear Reactor

Richard E. Faw, Director
127 Ward Hall
532-5963

Another major scientific facility is the TRIGA Mk II nuclear reactor and related equipment. In addition to basic research involving neutron spectroscopy and neutron cross-section studies, the Reactor Laboratory affords the entire University community neutron activation analysis capabilities for sensitive, non-destructive analysis. For further information, write the director, Reactor Laboratory, Department of Nuclear Engineering, 127 Ward Hall, Manhattan, Kansas 66506-2506.

Biological Research Facilities

Terry Johnson, Director
233 Ackert Hall
532-6705

Konza Prairie

Konza Prairie Research Natural Area is an 8,616-acre area within a few miles of the University dedicated to ecological research by the Division of Biology and the Kansas Agricultural Experiment Station. This nationally important research facility provides an opportunity for basic research on the prairie and for baseline information needed to assess the nature and magnitude of the ecological changes resulting from human activity.

Center for Basic Cancer Research

The Center for Basic Cancer Research offers numerous educational and research opportunities. Each year the center offers research awards to allow deserving undergraduate students an opportunity to participate in cancer research that is ongoing in the Division of Biology. The anticancer drug laboratory, a research facility that opened during the 1982-83 academic year, allows students to focus research on anticancer compounds—determining the mode of action of these compounds, their molecular action, the

reasons for their toxicity, and the reasons why some cancers have developed a resistance to them. The anticancer drug laboratory is an integral part of the Center for Basic Cancer Research and it allows for the training of basic cancer research scientists.

BioServe Space Technologies

The Division of Biology, in cooperation with Aerospace Engineering Sciences at the University of Colorado, has been selected by the National Aeronautics and Space Administration (NASA) to lead BioServe Space Technologies, a new Center for the Commercial Development of Space. The division directs the life science activities of the center, which adds a vast new dimension to the scientific education of future generations of students. This space training and research program gives young biologists, plant scientists, engineers, and others an awareness of opportunities in space sciences that will intellectually involve them in space missions of the future. Initial research projects are directed towards an understanding of many biological processes in the absence of gravity. Projects also are focused on areas of significant market value, such as biotechnology and bioengineered pharmaceuticals, synthetic organ products, and high efficiency agriproducts and agrigenetic materials.

Other facilities

Other facilities include the Kansas State University herbarium with a complete monographic library, a research and reference collection of insects in the Department of Entomology, greenhouses, aquatic and terrestrial research laboratories, animal quarters, controlled environmental chambers, and many pieces of specialized field and laboratory research equipment.

International Grains Program

C. W. Deyoe, Director

Established in 1978 with funds provided by the Kansas legislature, the International Grains Program promotes the marketing of wheat, corn, soybeans, sorghum, and other U.S. grains. As part of the effort to expand existing markets and to develop new ones for those agricultural commodities, program participants are trained in the processing and handling of U.S. food and feed grains, instructed in the use of the end products, and given a thorough understanding of the workings of the U.S. grain marketing system.

Laser Center

D. W. Setser, Director
123 Chemistry/Biochemistry Building
532-6692

The Laser Center is in Ward Hall and is used for fundamental research by faculty and students in chemistry, physics, and engineering. The lasers include rare gas halide pulsed lasers, continuous wave Ar ion lasers, and dye lasers. In the Chemistry/Biochemistry Building and Cardwell Hall, carbon dioxide, nitrogen, and Nd-YAG lasers are available. Thus, a wide range of laser frequencies and laser powers can be provided for a variety of different experiments. The Laser Center also has laboratory computers and a wide selection of spectroscopic equipment that can be used for monitoring laser-induced physical or chemical changes. For further information concerning this facility, write to D. W. Setser, Department of Chemistry or C. M. Sorensen, Department of Physics.

Other Research Facilities

A variety of specialized facilities is maintained to support research and scholarly work in the humanities, natural sciences, applied sciences, social sciences, and professional areas. Although an exhaustive listing is prohibitive, the following represent a selection of such supporting resources:

Arp electronic music synthesizer
Audiovisual materials center
Center for Excellence in Computer-Controlled Automation
Computer-Aided Design Laboratories (human ecology)
Consortium for Political Research data banks
Controlled environment test facility
Early Childhood Laboratory
Editorial offices of major journals
Evapotranspiration laboratory
Experimental animal facilities
Fourier transform spectroscopic laboratory
Glassblowing and instrument shops
Heliodon and wind tunnel
Institute for Environmental Research
Interior architectural shops
Near infrared protein laboratory
Nuclear magnetic resonance spectrometers
Physiology of exercise laboratory
Plant disease diagnostic laboratory
Population and demographic laboratory
Recording Raman spectrometer

Scanning electron microscope
Sensory Analysis Center
Soil testing laboratory
Statistical laboratory
Textile chemistry laboratory
Textile conservation laboratory
Transmission electron microscope
Veterinary diagnostic laboratory
Weather data laboratory
Wind and soil erosion laboratory
X-ray diffractometers

Scholarly and Professional Publications

Agricultural Extension

Numerous publications about research, in varied formats for various audiences

College of Architecture and Design

Newsletter of the Rural/Small Town Planning Division, American Planning Association—information, articles, and essays on the nature of rural/small town planning
OZ—modern architectural trends

Department of English

Kansas Quarterly—prize-winning literary magazine, short stories, poetry, art, history, literary criticism
Literary Magazine Review—reviews of literary magazines and commentary on the international noncommercial literary magazine scene
The Manhattan Project—proceedings of the summer conference for high school writers
Touchstone—student literary magazine
Young Kansas Writers—anthology of creative writing by secondary school students

Department of Chemistry

Applied Spectroscopy—technical journal on spectroscopic research in chemistry and physics

Department of History

Journal of the West—history and culture of the U.S. West (illustrated)

Department of Modern Languages

Studies in Twentieth Century Literature—literary theory and practical criticism of twentieth century literature in French, German, Russian, and Spanish (with University of Nebraska-Lincoln)

College of Education

Educational Considerations—timely papers on educational issues at all levels
Media Adult Learning—research, reviews, papers

College of Engineering

Kansas State Engineer—technical and nontechnical articles on engineering developments
Research Activities—biennial report on research in the College of Engineering

College of Veterinary Medicine

Veterinary and Human Toxicology—toxicology, research, reviews, and field observation

Continuing Education

National Issues in Higher Education—proceedings of annual meetings on educational issues
IDEA Papers—series on college teaching, from the Center for Faculty Evaluation and Development
 Rural Clearinghouse for Education and Development model programs, research reports, conference proceedings, and policy analysis
Rural Adult Education FORUM—articles and program briefs on rural adult continuing education

Center for Basic Cancer Research

Accepting a Challenge—Kansas State cancer research and education

Libraries

Bibliography Series—each bibliography on a different topic

Agricultural Experiment Station

Walter Woods, Director
 George E. Ham, Associate Director
 Stanley E. Leland, Jr., Associate Director
 Michael D. Lorenz, Assistant Director
 Barbara S. Stowe, Assistant Director
 Steve C. Morgan, Editor
 Eileen K. Schofield, Associate Editor
 113 Waters Hall
 532-6147

The Kansas Agricultural Experiment Station (KAES) is supported by both federal and state funds. Annual sessions of the Kansas legislature and U.S. Congress provide funds to operate the experiment station. Fees and commercial organizations also provide some support, as do sales of experimental crops and animals.

The mission of the KAES is to conduct original research to enhance the capability of agriculture in its broadest sense to provide adequate food and fiber and improve rural living and human nutrition for present and future generations.

The KAES, with headquarters in KSU's Waters Hall, operates on an annual budget of nearly \$33 million. Research is per-

formed both on and off campus (on state-owned and leased land), and researchers have access to laboratories and scientific equipment. Twenty-eight departments in five of the University's colleges are involved. The station is also strongly allied with the Graduate School; interested graduate students are encouraged to seek research assistantships to supplement their study programs.

Departments of the KAES are, by college:

Agriculture: agricultural economics; agronomy; animal sciences and industry; entomology; forestry; grain science and industry; horticulture; plant pathology.

Arts and sciences: biochemistry; biology; chemistry; economics; physics; sociology, anthropology, and social work; statistics.

Engineering: agricultural engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering, nuclear engineering.

Human ecology: clothing, textiles, and interior design; human development and family studies; foods and nutrition; dietetics, restaurant and institutional management.

Veterinary medicine: veterinary diagnosis; laboratory medicine; pathology; anatomy and physiology; surgery and medicine.

Off-campus research is centered at two research-extension centers and two branch stations—Northwest, Fort Hays, Southwest, and Southeast Kansas—and 11 experiment fields in various parts of the state.

Research by scientists in the KAES is organized into more than 600 projects, which cover nearly all phases of agriculture and related industries. Among projects in progress are those concerned with physiology and nutrition of plants and animals; water resources, with special attention to conservation and distribution of available water for irrigation and other agricultural uses; feeds for livestock; marketing of agricultural products; production, maintenance, and use of farm machinery and equipment; sociological problems; community development; and home economics, with emphasis on food science, human nutrition, family living, and institutional management.

Results of research are published in scientific journals; in station bulletins, pamphlets, reports of progress, research papers, and reports at field days and other special events; and in popular journals and news releases to the press and radio and television stations. Inquiries about or requests for station publications, which are available free or at minimal charge to citizens of the state, should be sent to the Distribution Center, Umberger Hall, Manhattan, Kansas 66506-3413.

**Off-campus research
Fort Hays Branch Station**

Patrick I. Coyne, Head and Professor

Professors Brethour, Harvey, and Martin; Associate Professors Kofoid, Seifers, and Stegmeier; Assistant Professors Olson, Stahlman, and Thompson.

The oldest and largest of the branch stations, Fort Hays Branch Station (south of Hays in Ellis County), was organized in 1901, after the state legislature provided for its organization and appropriated funds for its operation. The station owns 3,260 acres, and 465 acres are leased from Fort Hays State University. Some research is cooperative with that university.

Investigations are primarily related to problems peculiar to the western half of the state, where rainfall is limited. They include beef grazing, feeding, and breeding studies; crop improvement, with special emphasis on wheat, sorghum, millet, and sunflower; soil management; weed control; plant diseases; and insects as related to crops and livestock.

Northwest Research-Extension Center

Richard S. White, Head and Professor
 Reba B. White, Associate Head

Associate Professors Adams, Lawless, Mikesell, Schwulst, and Sunderman; Assistant Professors Ferrell, Houghton, Nelson, and Strine; Instructor Lamm.

When it was established in 1987, the Northwest Research-Extension Center merged activities of the Colby Branch Experiment Station and the Northwest Area Extension Office to meet combined research and extension needs of northwest Kansas. The center occupies 727 acres. Major areas of research are crop improvement, soil and water management, sheep production, and horticulture. Extension emphasis includes specialists in agronomy, economics, forestry, home economics, and livestock.

Southwest Research-Extension Center

James A. Schaffer, Head and Associate Professor

Professors Greene and Mann; Associate Professors Buschman, DePew, Herron, Sloderbeck, and Witt; Assistant Professors Freeman, Morishita, Mosier, Kreikemeier, Norwood, Schlegel, Spurgeon, Young, and Zoellner.

A 99-year lease from the Finney County commissioners to the Kansas Board of Regents, beginning June 14, 1907, provided 320 acres for agricultural research. The lease was renegotiated in 1988 for another 99 years. Additional adjoining tracts totaling 235 acres were purchased in 1937 and 1939. Since 1948 an 80-acre irrigated tract has continuously been made available for research by the Garden City

Company. Some additional land is rented or leased. In July 1986 the Garden City Branch Experiment Station and the Tribune Branch Experiment Station (190 acres) were combined to form the Southwest Kansas Branch Experiment Station with headquarters at Garden City. In June 1987, The Palen Farms, Inc. of Denver, Colorado, donated 40 acres of land that is adjacent to the Tribune Unit.

Current investigations involve irrigation research, dryland soil and crop management, crop improvement, weed control, insect and other pest control in crops and livestock, specialty crops, and soil and fertilizer relationships. Also beef cattle nutrition and management studies are conducted. Many research projects are conducted jointly between station and on-campus scientists.

Current planning involves the development of the Southwest Kansas Research-Extension Center from the present facilities of the Experiment Station and Area Extension Office.

Southeast Kansas Branch Station

Lyle W. Lomas, Head and Associate Professor

Assistant Professors Coffey and Kelley; Associate Professors Moyer and Sweeney; Instructor Granade.

The Southeast Kansas Branch Experiment Station in Labette County was established in 1949. The station operates a total of 1,093 acres, 764 acres of which are owned and 329 of which are leased (including 49 at Columbus and 280 at Mound Valley).

Soil studies in relation to water conservation, yield and quality of crops, weed control research, field crop investigations, beef cattle investigations, and extensive forage research are being conducted at this station.

Experiment fields and irrigation development farms

The Kansas Agricultural Experiment Station includes 11 experiment fields of 20 to 320 acres each. Five are operated by the KSU Department of Agronomy. They are on different soil types and in different climatic conditions. Three fields are supervised jointly by the KSU Departments of Agricultural Engineering and Agronomy and include irrigation studies.

Fields, most of which are leased, are Cornbelt (Powhattan), North Central Kansas (Belleville), Irrigation (Scandia), Sandyland Irrigation and Dryland (St. John), South Central Kansas (Hutchinson), Harvey County (Hesston), East Central (Ottawa), and Kansas River Valley Irrigation (Topeka, Rossville, and Silver Lake).

Experimental work is devoted to horticultural and forest crops at three fields:

Horticulture Research Center (Wichita), Pecan Experiment Field (Chetopa), and East Central Horticulture Field (DeSoto).

Special agencies affiliated with the AES

Kansas Water Resources Research Institute
Cooperating with the Water Resources Institute, University of Kansas
Hyde S. Jacobs, Director

Established the same year that Congress passed the Water Resources Act (1964), the Kansas Water Resources Research Institute has a double charge: to conduct both basic and applied research on water use and to train scientists in water resources. By Regents' stipulation, representatives of KSU and The University of Kansas participate in institute policy making and research. The institute may support water resources research in any department of either university toward the end of providing maximum benefit to Kansans. Research

is focused on finding the most effective ways of conserving, using, and distributing available water for the greatest benefit of today's and tomorrow's citizens.

Food and Feed Grain Institute

C. W. Deyoe, Director

The Food and Feed Grain Institute has these goals: to develop effective methods of milling and processing grains; to evaluate and improve the quality and nutritional properties of food grains; to find new uses for grains; and to improve the handling, transporting, storing, and domestic and international use of grains and grain food products. Institute scientists are faculty members of the Departments of Grain Science and Industry, Agricultural Economics, Agricultural Engineering, and personnel of other agencies like the U.S. Grain Marketing Research Center.

Statistical Laboratory

George Milliken, Director

This laboratory, established in 1946 and administered by the Department of Statistics, is especially equipped and staffed to serve scientists associated with the Agricultural Experiment Station. Both consulting and computational services are available.

Other general services

Chemistry laboratories available to station researchers include those used primarily for research on feed stuffs (animal sciences and industry), grain protein (grain science and industry), and for soil testing (agronomy). The scanning electron microscope maintained by the Department of Entomology is used increasingly by station scientists for particular projects. Other services are provided by the Weather Data Library, Plant Diagnostic Laboratory (plant pathology), Population Research Laboratory (sociology, anthropology, and social work), and Veterinary Diagnostic Laboratory.

Outreach

International Agriculture

Vernon C. Larson, Director
Jim Jorns, Assistant Director

108 Waters Hall
532-5714

Since the first foreign students were admitted in 1898, people from and in other countries have helped Kansas State University forge a proud achievement record in international activities. Most of these activities have focused on helping developing countries establish land-grant type institutions geared to increasing food production and improving the country's economy.

KSU has been involved in international activities since 1956 when its Colleges of Agriculture, Human Ecology (then Home Economics), and Veterinary Medicine were selected for work in India. The KSU Office of International Agricultural Programs was established in 1960 as the center for agricultural and veterinary medical programs already under way. Most of its activities have been through the Agency for International Development (AID).

During the work with India (1956-1972), 59 faculty members served there, and 160 Indian teachers studied at KSU. The work centered at Andhra Pradesh Agricultural University. Most of that university's deans and department heads earned Ph.D. degrees at KSU.

In Nigeria, KSU helped develop colleges of agriculture and veterinary medicine at Ahmadu Bello University (1964-1977). More than 90 faculty members worked in Nigeria and 70 Nigerian faculty have taken graduate training in the U.S., primarily at KSU. In 1980 the University became the recipient of a three-year USDA grant to reestablish linkages with Ahmadu Bello University. Eight similar grants were made available to U.S. universities that had assisted in establishing universities in a developing country. A prime requisite of the \$100,000 grant was that it must be beneficial to both the U.S. and foreign institutions.

From 1977 through 1983 the principal international project of KSU was with the government of the Republic of the Philippines. This \$20 million program, the Integrated Agricultural Production and Marketing Project, was funded by USAID and Philippine monies, with KSU contract-

ing directly with the Philippine government to provide the technical assistance within the Ministry of Agriculture in agricultural policy, agribusiness, agricultural statistics, agricultural extension, and cooperative development; at the University of the Philippines in Los Banos, for the development of an M.S. program in food systems economics; at Central Luzon State University, for the development of a B.Sc. program in food systems economics; in development of improved agricultural technology for the area's small farmers; in helping to develop a more effective rural marketing system; and in the design and construction of a pilot food and feed processing center.

The long-term impact of the project will be strengthened through the 92 Philippine professionals who earned advanced degrees at KSU and other universities in the United States and the more than 150 Filipinos trained in technical programs in the United States and other countries.

Over the life of the project, 21 KSU permanent and temporary faculty served consultancies of one year or longer and 46 others worked on special projects for periods of from two weeks to six months.

The Food and Feed Grain Institute highlights KSU's unique competence in the postharvest technology of food and feed grains. It has provided international technical assistance and research to over 50 countries since its inception in 1966.

KSU also is linked with the land-grant institutions of Iowa State, Missouri, Oklahoma State, and Nebraska to form the Midamerica International Agricultural Consortium (MIAC). This arrangement enables the University to respond quickly to international agency requests for assistance to developing countries in solving their food problems.

In August of 1982 KSU subcontracted with MIAC to serve as the lead institution to administer the Farming Systems Research Project in Botswana, Africa. The emphasis of this USAID-funded project is the development, within the research division of the Ministry of Agriculture, of an on-farm research component linked to the Botswana Extension Service. Six KSU faculty are currently on long-term assignment in Botswana and six Botswana professionals are in degree programs at KSU and other MIAC institutions. MIAC also has current projects in Liberia, Morocco, Tunisia, Peru, and Kenya.

The University is also involved in a joint memorandum of understanding with Alabama Agricultural and Mechanical University and AID. The ultimate objective of this cooperative relationship is the prevention of famine and freedom from hunger. The objective will be realized by providing long-term support to the application of science for solving food and nutrition problems in developing countries; by improving the University involvement in AID's effort to apply science to the goal of increasing world food production; and by strengthening the capabilities of KSU in programs related to institutional development.

Kansas State University fully endorses the "Basic Principles for College and University Involvement in International Development Activities" as approved by the National Association of State Universities and Land-Grant Colleges. The basic principles are as follows:

- Principle 1. Effective participation in international development activities requires a commitment by both administration and faculty.
- Principle 2. Effective involvement in international development activities should be consistent with the institution's mission, commitment, and competencies.
- Principle 3. Requisite key and supporting personnel resources must be available to assure effective, responsible, and continuous involvement in each project undertaken.
- Principle 4. Adequate incentives should exist to assure that high quality, professionally active faculty members become involved in developmental activities.
- Principle 5. Adequate and timely logistical support of and professional service to a faculty member or a team abroad requires special administrative policies and practices.
- Principle 6. Provision of adequate orientation and specialized training of project personnel is necessary, especially before departure for international assignments.
- Principle 7. Teaching, research, and public service activities of the university are enhanced by properly selected and executed international development activities, followed by appropriate integration efforts.
- Principle 8. Adequate and appropriate training for international students, particularly through contract training programs, depends on specially focused university policies and practices to deal with

the students' unique needs and background, and the highly specialized requirements of the training program.

Principle 9. Internal evaluation procedures are necessary to provide for continuous monitoring of activities, including international, and prompt adjustments when needed for international development activities.

Kansas Regents Educational Communications Center

Melvin Chastain, Director
Bob Dole Hall
532-7041

Established as a Regents' Center in 1987, the Educational Communications Center (ECC) began programming activities in the spring of 1989. The 32,000-square-foot ECC building (Bob Dole Hall), completed in the summer of 1990, houses instructional television and related telecommunications studios, and production, editing, and distribution facilities, including C-Band and Ku-Band uplinks and receive dishes. The center also houses studio and control room facilities for instructional use by journalism and mass communications faculty and students.

Designed to provide electronic access to and interconnection between each of the Kansas Regents' Institutions, the ECC is aligned administratively under the Office of the Provost. The center not only produces and distributes university-level instructional material, but develops course work and in-service content for public schools, as well as credit and non-credit continuing education material.

Division of Continuing Education

LaVerne B. Lindsey, Assistant Provost for Continuing Education

Sue Maes, Associate Director, Continuing Education

Roberta Flaherty, Associate Director for Program Development, Continuing Education

Edward M. McAleer, Jr., Director, Academic Outreach Section

Richard Claussen, Director, Conferences Section

Douglas W. King, Director, Administrative Systems

Jacqueline Spears, Director, Planning and Resource Development

Lynda Spire, Director, National Conferences

Richard Friesen, Director, UFM

Enid Cocke, Director, English Language Program

Jan Kruh, Director, Kansas Regents Network

William Cashin, Director, Center for Faculty Evaluation and Development

College Court Building
532-5566

Professor Lindsey; Associate Professor Cashin; Instructors Aasen, Bailey, Baltzer, Barton, Butler, Carter, Claussen, Cocke, Cody, Cokinos, Combs, Collins, Flaherty, Friesen, Galitzer, Gottschalk, Gronau, King, Kowalczyk, Kruh, Lawrence, Lewis, Madison, Maes, Matteson, McAleer, McCulloh, Murphy, Nikkel, Oliver, Parmley, Peverill, Pruett, Saueressig, Sinn, Sixbury, Spears, Spire, Stanley, Stauffer, Tatarko, Trent, Vreughenhil, Wherry, Wood, M. Woodward, and Woodward.

The Division of Continuing Education was formally established in 1966 by the Kansas Board of Regents. It functions as the coordinating agency through which Kansas State University makes its resources available statewide.

A variety of credit and noncredit educational programs for professional development or personal enrichment is offered to residents of the state and country. Each year more than 40,000 people participate in noncredit activities and off-campus credit courses in Kansas communities and throughout the United States.

K-State summer session

Summer Session is an integral part of the educational program of Kansas State University. The particular courses offered are determined by each college on the basis of expected student demand and compatibility with unit mission. The summer session is designed to meet the needs of the following groups:

Undergraduate and graduate students who wish to accelerate their programs of study toward an early graduation, and those who wish to make up courses missed during fall or spring semesters.

Teachers and other professionals who are unable to attend the University during the two semesters.

Special interest, nondegree groups, including public school, business, and industrial personnel, and returning students.

High school graduates seeking to get a head start on college. Regular introductory courses and special programs designed for

high school students are available. These students find it valuable to establish study habits, become acquainted with the campus and faculty, and adjust to University life.

All facilities and services of the University available in the regular semesters are also available in the summer, including housing, food service, counseling and testing services, Lafene Health Center, and K-State Union recreational programs.

Summer activities offered by K-State and the community include movies, lectures, the Arts in the Park series, concerts, and other recreational activities.

The eight-week summer session offers short courses in which a student may earn as many as 9 semester hours of credit. Full-credit concentrated short courses accommodate students who cannot attend the eight-week session. There are also workshops and institutes offered.

The *Summer Session Bulletin* gives complete and detailed information about summer school. It is available in April each year. Information on short courses, workshops, and institutes is available in March. A free copy may be obtained from the Division of Continuing Education.

Through the Regents Network, some KSU summer courses are offered at 37 Kansas locations and at others by access to electronic bridging equipment. (See Regents Network for schedules and regular locations.) TELENET allows individuals to enroll in courses offered by KSU and two other Kansas universities.

The summer session teaching staff is formed from the regular instructional staff of the University, supplemented by visiting professors and lecturers.

Courses offered in the summer are chosen from those offered in regular semesters; conferences and workshops are planned to meet special needs.

Off-campus credit classes

The Division of Continuing Education strives to determine the educational needs of the people throughout the state and respond to those needs with credit courses, programs, and services from the various colleges and academic units.

An ever-expanding schedule of courses is offered at a growing number of locations in Kansas. Kansans may work toward an advanced degree from Kansas State University by attending classes taught by University faculty in students' home communities. Programs of sequenced courses lead to degrees in education, home economics, social work, and other disciplines.

In addition to sequenced courses leading toward graduate or undergraduate degrees, courses in response to specific requests or designed for particular groups are scheduled through the Division of Continuing Education and taught off campus. In-service training programs for professional groups are frequently requested; academic units of Kansas State University respond to such requests by providing workshops, conferences, or short courses designed to cover topics of current interest to these groups. Distance learning courses are offered through a combination of the following media delivery systems: printed course materials, audio tapes, video tapes, television, and teleconferences (audio, audiographic, video, and computer).

For detailed information contact the KSU Outreach coordinator, College Court Building, (913) 532-5687, or toll free in Kansas 1-800-432-8222.

Intersession

Kansas State University conducts its intersession program during major breaks in the standard academic calendar. There are two intersessions each year: one in early January, the other in late May and early June. During intersession, 40 to 60 courses are offered, including both regular and new or experimental courses. These courses generally run for two or three weeks and are attended by current KSU students, as well as by people unable to attend the University during the regular semesters. Intersession classes are open to the public; prior enrollment is not required.

Intersession offers the opportunity to study in another part of the state or country which would not be possible during regular school terms. Students also have the opportunity to explore new interests and topics in their majors with more depth and concentration than might otherwise be possible. Many students use intersession as an opportunity to examine academic areas not scheduled in their current curricula. The KSU faculty uses intersession as an opportunity to experiment with new ideas and formats for teaching. Many experimental courses test their possibilities for becoming regular offerings.

Intersession courses are considered part of the regular KSU course offerings and, as such, can fulfill degree requirements or requirements for recertification when applicable. Students are encouraged to consult with their advisors to determine if a particular intersession course will meet necessary degree requirements.

Food technology program

K-State has developed 36 hours of course work in food technology using guided independent course work and guided study with campus laboratory sessions. The

program was developed to meet the requirements established by the Food Safety and Inspection Service, Meat and Poultry Inspection Division, USDA, for the position of food technologist. The courses in the program are offered in a combination of media delivery systems, including video tapes, audio tapes, and campus lab sessions for selected courses. Students enroll in the courses at any time and complete them within a year. Completion of 20 semester hours of food science courses leads to a food science certificate.

Fort Riley courses

KSU works in cooperation with the Army Education Center to provide people in the nearby Fort Riley community the opportunity to take University courses. Courses are scheduled at convenient times to assist military personnel and their dependents.

The courses are taught by regular KSU faculty members and allow the pursuit of associate, bachelor's, and master's degrees in several academic disciplines. Areas of study in highest demand include general social sciences, business administration, and education. KSU courses offered at Fort Riley are open to all area residents, although military personnel have priority.

Kansas State University maintains an office at Fort Riley staffed by KSU personnel familiar with degree requirements and KSU procedures on acceptance of transfer work. Students are encouraged to meet with these advisors to pursue their academic goals. For additional information contact the KSU coordinator at Fort Riley, (913) 784-5930.

Servicemember's Opportunity College

Kansas State University is a cooperating Servicemember's Opportunity College (SOC), a member of the Associate Degree (SOCAD) Network, and a member of the Bachelors for Soldiers (BDFS) Network. KSU maintains a commitment to servicemen and servicewomen interested in pursuing college educations. In addition to degree programs at Fort Riley, KSU offers graduate course work at Fort Leavenworth.

Regents Network (TELENET)

Many courses and educational programs offered on the KSU campus are available to the people of Kansas by means of the Regents Network (TELENET). The network is a teleconferencing system of educational centers located throughout Kansas and linked together via telephone lines. The locations include Abilene, Arkansas City, Atchison, Belleville, Beloit, Chanute, Colby, Concordia, Dodge City, El Dorado, Emporia, Garden City, Goodland, Great Bend, Hays, Howard, Hutchinson, Independence, Larned, Lawrence, Liberal, Manhattan, Marysville, Newton, Norton,

Ottawa, Overland Park, Paola, Pittsburg, Pratt, Sabetha, Salina, Stockton, Topeka, Wathena, Wellington, and Wichita.

Each TELENET center is equipped with microphones and speakers allowing easy interactive communication among all locations. Each center is equipped with audio-visual support equipment, and a teacher's aide is present at each location to operate the equipment, distribute hand-out materials, and provide general educational support.

Each year several thousand people use TELENET to participate in credit and noncredit courses at the graduate and undergraduate levels. Instruction originates from KSU or one of the other Regents universities. However, the flexibility of the system allows resource people from throughout America to be linked electronically into the system. Thus, Kansans across the state can have access to national educational resources.

A TELEbridge has been added to the Regents Network to allow additional temporary teleconferencing classrooms to be established anywhere in Kansas for university courses, in-service training, meetings, or conferences. The TELENET and TELEbridge together provide a convenient and economical educational delivery system for the state.

Non-Traditional Study Program

The Non-Traditional Study Program (NTS) is designed for undergraduate students who are unable to complete degree requirements in conventional manners. NTS is oriented toward those students who have encountered obstacles to traditional college attendance, helping them surmount barriers created by distance, physical handicap, employment, or family need.

NTS advisors assist students in planning individual programs of study and serve as guides to faculty and media resources. The advisors help students select options such as late afternoon, evening, or off-campus classes; correspondence study; credit by examination; audio and video courses; telecourses; TELENET courses; or internships.

In addition to class requirements, the advisors direct students toward the completion of independent study projects and the development of documentation of prior nonsponsored learning. Given documentation and review by appropriate units, credits may be granted for learning achieved without formal, sponsored instruction.

Students graduating through the NTS program may earn baccalaureate degrees in traditional academic areas.

Conference Office

The KSU Conference Office makes the University facilities and resources available to individuals and organizations through the design and management of conferences, short courses, workshops, special interest programs, and noncredit programs. All programs sponsored by KSU in which fees are collected from the participants and/or University facilities are used are coordinated through this office, which is empowered to collect all fees associated with such activities.

Services available through the Conference Office include program development, design, and budgeting; brochure design and printing; publicity; facility, food, and accommodation arrangements; speaker and resource arrangements; preparation of materials; registration; and follow-up activities.

The office can assist in budgeting a meeting into a grant proposal; bidding to host a professional association on campus or elsewhere; disseminating research; and pursuing an area of interest with others.

Organizations outside the University may use these program services to facilitate meetings of their membership or employees. The Conference Office can also make many of its training programs available for in-house employee development.

For further information on these services or specific training programs, contact the KSU Conference Office, College Court Building, Manhattan, Kansas 66502-6006 or phone (913) 532-5575.

Community Enrichment

The community education program provides lifelong learning opportunities to the Kansas State University and Manhattan communities. Both adults and youth receive instruction in a variety of current topics. More than 120 classes are available during the six sessions annually. Special events and instructional programs are usually offered on a noncredit basis, with scheduling during the afternoon, evenings, and weekends.

Classes are scheduled each semester, including the summer, and offer instruction in aquatics, all levels of microcomputer training, cultural arts, personal enrichment, gymnastics, horsemanship, martial arts, music, sign language, sailing, and tennis. Various clinics, workshops, and special events are offered during the summer sessions.

Community enrichment also functions as the initial contact for groups not affiliated with KSU who are interested in using facilities on campus.

Persons interested in further information on classes should contact KSU Community

Enrichment, 1615 Anderson Avenue, Manhattan, Kansas 66506 or phone (913) 532-5575.

National Conference Office

The National Conference Office extends the expertise of the University to both national and international markets. This unit focuses on expansion of the National Issues in Higher Education Conference Series and offers conference coordination services to higher education organizations. The office develops conferences to address new and emerging research and disseminate its results.

The National Conference Office is equipped to handle all phases of conferencing, including program development, budgeting, site selection, publication preparation, marketing, registration, and financial accounting. Conferences ranging in all degrees of complexity and in sizes from 8 to 1,000 participants are routinely coordinated by the office in locations throughout the United States.

Conferences of a national scope allow participants to gain valuable information through formal programing. Another important aspect of national conferences is the insight gained through networking with colleagues who share similar objectives. A continuing goal of the National Conference Office is to facilitate opportunities for continued professional growth for individuals in the field of higher education.

Issues in Higher Education Conference Series

A national conference series, Issues in Higher Education, originating at Kansas State University provides a forum for the exchange of ideas among professionals in higher education. The series is designed to deal with contemporary problems not treated extensively through research or current literature. Some themes have become annual events, and new topic areas are added each year. Each conference also generates a volume of proceedings for future reference by professionals.

Center for Faculty Evaluation and Development in Higher Education

The Center for Faculty Evaluation and Development was created in 1975 by a grant from the W. K. Kellogg Foundation. The center is now supported by fees received for its services.

Among the services available from the center are the Instructional Development and Effectiveness Assessment system (IDEA), the center's system for student ratings of college classroom teaching; and the Departmental Evaluation of Chairperson's Activities for Development (DECAD), a parallel system of faculty ratings of department heads. Center staff consult and present seminars and workshops for

individual institutions on evaluating college faculty, managing the academic department, improving college teaching, teaching higher-order thinking, and improving college testing. Center materials and services have been used by more than 500 institutions, including doctorate-granting universities, liberal arts colleges, and vocational-technical institutes.

For additional information contact the Center for Faculty Evaluation and Development, 1615 Anderson Avenue, Manhattan, Kansas 66502-1604, (913) 532-5970.

Planning and Resource Development

The Planning and Resource Development section serves as liaison between the Division of Continuing Education and external agencies, organizations, and institutions. Planning and Resource Development offers assistance in grants and contracts, needs assessment and market analysis, and promotion.

Grants and contract assistance includes identification of government, foundation, and corporate funding sources and assistance in writing grant proposals for outreach projects. Design and implementation of needs assessment surveys related to development of new educational outreach programs are available. With computer assistance, the survey data are analyzed and a summary and recommendations are provided for future program development. Promotional assistance includes brochure development, media coverage, advertising, marketing, and direct marketing identification.

Also in the Planning and Resource Development office is the Rural Clearinghouse for Lifelong Education and Development. Funded by a number of private foundations, the Rural Clearinghouse is a national effort to improve rural access to continued education.

UFM

UFM is a community learning center which develops and conducts a variety of informal educational opportunities that do not involve prerequisites, grades, or credits. More than 500 programs are available during the three sessions a year. Classes, symposia, forums, and unstructured learning experiences covering a wide range of human interests, activities, and concerns are offered.

Through the Community Resource Act funded by the Kansas legislature, UFM provides technical assistance and grant monies to develop similar community education programs across Kansas.

UFM also sponsors the Lou Douglas lecture series, Manhattan Community Gardens, a pottery studio, the Parent Support Program, and several literacy projects.

English Language Program

The English Language Program offers intensive English courses primarily for international students who plan to enter degree programs at KSU. However, it also accepts students who wish to come only for English instruction.

The program offers three levels of intensive English for full-time students and half-time study for advanced students. The advanced class is divided into two sections to meet the specific needs of undergraduate and graduate students. The English Language

Program courses are offered in the regular University schedule of fall and spring semesters plus an eight-week summer school.

The program screens the English proficiency of all incoming non-native speakers who have a TOEFL score below 600. Those whose English is not yet adequate for university-level work will be placed in the appropriate English classes. The program also serves as a resource for students who are not required to take further English courses but still seek help for specific problems.

Students who wish to study English as a second language before entering a degree program should apply first for undergraduate or graduate admission and then should apply to the English Language Program.

For a brochure and other information, write the English Language Program, 205 Fairchild Hall. (For course descriptions, see the listings in the Department of English section of this catalog.)

Division of Cooperative Extension

123 Umberger Hall
532-5820

The basic mission of extension is to deliver informal, out-of-school, noncredit educational programs that help people solve their problems. These programs are based on up-to-date research and practical applications of knowledge conducted by this and other institutions. Extension is people-, problem-, and progress-oriented.

The Cooperative Extension Service provides an important learning bridge between the University and the people of the state. It takes scientific knowledge, principles, and practices that bear directly on the grass roots problems of people in all parts of the state. At the same time, this unique information delivery system brings back requests for new knowledge to the research staff at the University.

Basis for cooperative title

The Cooperative Extension Service is so named because the federal, state, and county governments cooperate with local people in planning, conducting, and financing a county wide educational program.

Kansas State University represents the state in this system through the Division of Cooperative Extension. The United States Department of Agriculture represents the federal government. The County Extension Council and the Board of County Commissioners, elected by the voters, represent the county.

Since its charter is broad, extension's educational programs must be broad in scope and directed to all population segments that have concerns relating to the five major programs—agriculture, home economics, 4-H youth, community development, and energy.

The audience for extension efforts includes urban and suburban people, as well as the farm families for whom the original programs were designed. Extension specialists recognize their charge to share new knowledge with all people, and thus keep their programs progressive, popular, and personal.

Extension takes the University to the people

The Cooperative Extension Service helps maintain a County Extension Office, operated by off-campus KSU faculty members, in all 105 Kansas counties.

These county agents are teachers, organizers, educational advisors, and consultants who bring relevant programs to bear on the problems identified by the people in their counties. To literally thousands of people,

these extension agents are a constant channel for communicating with Kansas State University.

Extension brings people to the University

Extension agents acquaint many people with the work of the University by organizing and conducting group visits to the University and its branch experiment stations and fields. Many statewide organizations in agriculture, home economics, and 4-H youth work are given assistance with annual conferences at the University. Included in this educational work are the various breed, seed, and feed associations; the Kansas Extension Homemakers Council; and 4-H Discovery Days.

Extension stimulates community action

Extension workers may assist persons to work together as a group for common goals such as organizing countywide campaigns to control diseases, pests, and weeds; conserve soil and moisture in an entire watershed; and study many different local, state, and national problems. They help conduct fairs and teach good standards of production in agriculture and home economics by serving as judges at county and state fairs.

Extension teaches in many ways

The methods of instruction used by extension workers are quite informal. Information on specific problems may be given through meetings, workshops, direct and media information flow, consultations, and demonstrations.

Extension agents also are specialists in training individuals who in turn train others, either individually or in groups. These public-spirited lay leaders often become, in effect, assistant instructors without pay.

Extension specialists are off-campus teachers

Highly trained specialists are stationed at the University and in area offices throughout the state. These specialists assist county extension agents by helping individuals consider problem-solving alternatives. They also apprise the county extension agents of new developments in research.

The role of the extension specialist is to interpret research developed by the state agricultural experiment station and USDA, to help county agents demonstrate the feasibility of applying new research through practical demonstrations, and to discover problems confronting the people of the state on which further research is needed.

Extension links people to educational programs

The county extension agents, as official representatives of the United States Department of Agriculture, are responsible for making people aware of educational programs affecting agriculture, family living, youth, community development, and related areas. The agents serve as a local source of information regarding programs of many other governmental agencies, such as the Soil Conservation Service, Rural Electrification Administration, Farm Credit Administration, and Agricultural Stabilization and Conservation Service.

Extension Agricultural Programs

Don D. Pretzer, Assistant Director,
Professor

Specialists in several departments of the Colleges of Agriculture, Engineering, and Veterinary Medicine offer direct educational and technical assistance to citizens throughout the state.

Departments have extension faculty who plan, conduct, and evaluate off-campus programs in their respective subjects. These specialists organize educational information, prepare support materials, and make presentations in counties upon request from county agents. Farm and ranch profitability is a focus in many programs.

In addition, extension offers interdisciplinary programs in four areas:

Food, feed, and forage production enhances sound production practices, good business management, efficient use of labor, and rapid adoption of new technology in food, feed, and forage production through application of physical, biological, and economic principles discovered through research and applied through an informal adult education process.

Animal production and utilization provides for effective production and use of meat, dairy, and poultry products for the consuming public through the application of research and management principles in genetics, animal nutrition and management, environmental physiology, marketing, engineering, and veterinary medicine.

Resource use and conservation focuses attention on increasing need for pollution-free soil, water, and air in rural and urban settings; zoning and land use; and public affairs education. It also emphasizes proper

management and conservation of fields, forests, water, and natural resources used in production and recreation.

Farm business and financial management helps producers effectively manage their farm, forest, or range enterprises. Farmers need continued information about factors influencing markets as well as insight into enterprise organization, total business structure, and procurement of supplies, labor, credit, and equipment.

Extension Agricultural Economics

Marc A. Johnson, Head

Barry L. Flinchbaugh, State Leader

Farm Management

Professors Barnaby, Fausett, Flinchbaugh, Johnson, L. Langemeier, and Schlender; Assistant Professors M. Langemeier and Nelson; Instructor Beech; Administrator DeLano; Farm Management Association Fieldmen Allen, Boessen, Crawford, Dawson, Dickson, Everson, Freeze, Germann, Herod, Huschka, Manny, Miller, Rempe, Roddy, Schwarzentraub, Smith, Stucky, Wahl, Wilken, Wood, and van der Hoeven; Emeriti: Professors Thomas and Whitehair; Associate Professors McReynolds and Parker; Assistant Professor Overley; Farm Management Association Fieldmen Collins, Faidley, Greene, Hackler, Hageman, Mullen, Sturdevant.

The extension educational program in farm management is divided into two areas: Kansas Farm Management Association programs, and area and state farm management programs.

In the Kansas Farm Management Association program, the 23 farm management fieldmen conduct an intensive educational program with 2,600 Kansas farm families via the County Extension Council in the six farm management associations. Each fieldman conducts a person-to-person educational program in farm management with 110 farm units. This program involves at least two fieldman visits to the farms for counseling, a visit in November and December for tax management purposes, county summary and analysis meetings, county fall crops and livestock forward planning meetings, individual summary and analysis of the farm and household records, special field days or tours, public tax management schools, and estate planning.

The program provides Kansas State University with a field laboratory and representative sample of farms for obtaining information important in conducting research and extension educational programs.

This sample of Kansas farms provides the foundation for development of publications and educational materials for the entire Kansas agricultural industry. In addition,

each association farm family leads in the dissemination of useful information in agriculture, home economics, and related subjects.

The extension farm management program is conducted by state specialists and area economists. It is done with in-depth educational programs in cooperation with the county extension agents. The area specialists conduct in-depth workshops in farm business management with farm families, provide a nearby reference resource for agents, and develop educational materials for agent use.

An important and successful tool is the *Farm Management Handbook*. This contains material on many of the specific management topics of concern to agents, farm people, and agribusiness interests.

Special interest topics include farm financial management, land economics, machinery investment analysis, farm business arrangements, farm records, and farm leases. In-depth workshops are conducted in cooperation with the production specialists and county agent. Cost-return analysis of the various livestock and crop programs is an important part of this public educational program. Publications and educational materials are prepared for distribution by county extension offices for the agricultural industry.

Special educational efforts are designed to meet the educational needs of agriculture-related businesses and persons, such as bankers, Production Credit Association managers, machinery dealers, and grain, feed, and supply firms.

Agricultural Policy

The public affairs extension educational program provides the people of Kansas and their leaders with educational information on policy issues of current interest. The purpose is to provide the people with the facts so that they have a broader and more accurate knowledge base from which to make decisions. No causes are espoused and no positions are taken; the program is educational, not political. Problems are analyzed, alternatives and consequences examined, and the people are challenged to reach decisions. The issues to be covered are determined by the people.

The economic information program provides the people of Kansas with current data on factors affecting farming, business and industrial operations, labor supply and demand, and family living costs. This helps them make day-to-day decisions or immediate or long-term business plans.

Extension Marketing

Professors Barton and Erickson; Associate Professor Tierney; Assistant Professors Abeles-Allison and Mintert; Emeriti: Professor Walker.

The extension marketing program operates on the philosophy that all people in Kansas have a vested interest in the efficient distribution of food and fiber products. Thus, the educational program remains open to all ideas, interests, and approaches to marketing, and a team approach is used to solve problems in the marketing field.

The main projects of marketing include marketing information, agri-business, and commodity marketing activities. News releases, monthly teleconferences, publications directed to the general public, and special information directed toward specific agricultural audiences are methods used to disseminate marketing information.

County public meetings are held where information covering price outlook, market systems, market structure, general economic trends in the nation, international trade, money and credit, bargaining power, balance of payment, and analysis of alternative farm policy proposals is presented.

Educational work is conducted with agricultural business firms handling food and fiber. Firms which buy directly from the farmer and sell input products and retail products and services are included. Educational work is conducted in the fields of sales, cooperatives, business management, market expansion, personnel training, advertising, and public relations.

The commodity marketing educational program emphasizes livestock, grain, dairy, and poultry marketing. Also included are market organization, supply-demand analysis, short-range price outlook, bargaining power, and transportation problems.

Extension Economic Development

Associate Professor Darling.

The Extension Economic Development is designed to assist communities in development efforts. News releases, publications, and seminars are conducted through county extension agents and area community development specialists.

Extension Local Government

Assistant Professor Young.

The extension local government program is designed to provide direct educational assistance to local governments in Kansas in the areas of management, finance, and policy. Educational programs are conducted through and in cooperation with county extension agents and area community development specialists.

Extension Agricultural Engineering

Stanley J. Clark, Head

James P. Murphy, State Leader

Professors Clark and Murphy; Associate Professors Black, Kuhlman, Powell, and Rogers; Assistant Professors Harner and

Taylor; Emeriti: Professors Holmes, Jepson, and Wendling; Associate Professor Schindler.

The function of extension agricultural engineering is to carry on an educational program throughout the state dealing with application of engineering principles to various phases of agriculture. The work of this department is carried to every county in the state by demonstrations, institutes, training schools, publications, news releases, radio and television programs, and personal contacts.

The department conducts educational programs throughout the state on subjects such as the control of soil erosion; the development, conservation, and use of water resources; irrigation systems and water management; animal waste management and water pollution control; the location, layout, and design of livestock production plants; selection, maintenance, and operation of farm machinery; systems for handling, sorting, conditioning, and processing grains and feeds; the selection, installation, and use of electrical power on the farm and in the home; and the design and development of improved housing for all Kansas families.

The department conducts a safety program in all subjects and assists with the development and planning of 4-H club programs which relate to the engineering phases of agriculture.

Much of the work is conducted in cooperation with the county extension office in each county. The remaining work is done in cooperation with various governmental agencies; the manufacturers and distributors of supplies, equipment, and machinery used on the farms; other groups or organizations which serve agriculture; electrical power suppliers; state officials; and regional and national professional groups.

Extension Agronomy

George E. Ham, Head
David A. Whitney, State Leader

Professors Ham, Kilgore, Regehr, and Whitney; Associate Professors Lamond, Mikesell, Ohlenbusch, Hickman, Fjell, and Shroyer; Assistant Professors Devlin, Kok, and Mosier; Emeriti: Professors Bieberly, Bohannon, Dicken, Edelblute, Lind, and Nilson; Associate Professor Harper.

Extension agronomy conducts a statewide educational program in agricultural crop production and natural resource conservation. The object of the program is to improve crop production efficiency, stabilize the agricultural economy through stable agricultural production, and conserve natural resources through the acceptance by the farm operators of proven production and conservation practices.

The responsibility of the agronomy specialists in this program is to interpret and disseminate the results of research conducted by the Agricultural Experiment Station and the United States Department of Agriculture researchers, promote the adoption of proven practices, and inform the scientists of needed research. The agronomy specialists correlate their program with specialists in other subjects to ensure the most effective overall extension program.

Extension Animal Sciences and Industry

Jack G. Riley, Head
Larry R. Corah, State Leader

Professors Adams, Call, Corah, Dunham, Henderson, Riley, Schafer, Simms, and Zoellner; Associate Professors Brazle, Kuhl, Laudert, and Spaeth; Assistant Professors Blasi, Frye, Goodband, Houghton, and Nelssen; Extension Assistant Olson; Emeriti: Professors Bonewitz, Francis, Good, Jackson, McAdams, Moyer, and Westmeyer; Assistant Professor Orwig.

Extension specialists in animal sciences and industry provide leadership for state programs in beef cattle, dairy cattle, horses, poultry, sheep, swine, meats, dairy products, and wildlife damage control. Programs are conducted in state areas and counties with producers and processors (both adult and youth) and the allied industries. These programs are planned in cooperation with clients, state, area, and county extension staff and are implemented cooperatively.

The function of wildlife damage control is to carry on an educational program throughout the state dealing with application of wildlife damage control methods that will minimize conflict between man and wildlife.

The work is based on the recognition that all species of wild animals are an important part of the environment in which we live, and that all species of wild animals have both negative and positive social and economic values. Encouragement is given to the use of techniques known to be of value in counteracting areas of conflict between humans and wildlife.

The work of this section is carried to every county in the state by conducting on-farm and in-town consultations. Records are kept and in each case efforts are made to determine the accurate cause and extent of economic loss. Specialists provide advice for prevention of further losses, and give control recommendations and demonstrations of equipment on an individual basis where damage has occurred.

Counsel is given on proper and up-to-date wildlife damage control procedures of

animals such as rats, mice, moles, gophers, coyotes, sparrows, starlings, pigeons, or other non-game species. Information is disseminated by radio, television, and printed educational materials.

Extension Entomology

Theodore L. Hopkins, Acting Head
Randall A. Higgins, State Leader

Professors Brooks, Cress, and Mock; Associate Professors Bauernfeind, Higgins, Lippert, and Sloderbeck; Extension Assistant Shufan; Emeritus: Professor Gates.

Extension entomology is concerned with practical insect control measures for Kansas citizens. The proper, safe use of insecticides is one of the methods used by Kansas producers to prevent insect damage. Cultural and biological methods are also used where appropriate. Extension entomology uses meetings, newsletters, and mass media to keep Kansas producers informed of populations of insects that may create problems. Pilot pest management projects are used to introduce and validate newer, integrated approaches to managing pest populations. The 4-H entomology project is designed to teach the interrelation of insects and the environment, as well as the identification of insects.

State and Extension Forestry

Raymond G. Aslin, State Forester
Thomas D. Warner, Head, Department of Forestry
John K. Strickler, Extension Forester

Professors Loucks, Naughton, Nighswonger, and Strickler; Associate Professors Aslin, Bratton, Gould, Pinkerton, and Rowland; Assistant Professors Bruckerhoff, Kunkel, and Strine.

This department is responsible for all state and extension forestry programs in Kansas. The foresters provide direct technical assistance to landowners in all forestry and forestry-related areas. Landowners receive assistance in management and marketing of their timber.

Assistance also is given in various types of conservation tree and shrub planting. A tree distribution program provides approximately one million low-cost seedlings each year for these conservation-type plantings.

A seed orchard for growing superior walnut and cottonwood planting stock is located near Milford Reservoir.

Foresters work closely with wood-using industries in the state to improve use of the timber crop.

The department also operates a cooperative rural fire control program. Assistance is given to rural fire districts in organizing, planning, obtaining fire equipment, fire prevention, and training fire district personnel.

Through contracts with the Corps of Engineers and the Bureau of Reclamation, the department develops vegetative management plans for public areas around reservoirs. The department is responsible for implementing these plans through tree planting, grass seeding, and recreational timber stand improvement.

Through a community forestry program, assistance is given to Kansas towns with the development of management programs for street, park, and other public trees.

The forestry offices are at 2610 Claflin Road in Manhattan. In addition to the administrative offices other facilities at this location are tree distribution, cold storage, greenhouse, and shop. Paneling of 12 Kansas hardwood species is on display in the building. Area forestry offices are in Chanute, Garden City, Hays, Hutchinson, and Manhattan.

Extension Grain Science and Industry

C. W. Deyoe, Head
Robert W. Schoeff, State Leader

Professors Balding, Curran, Pederson, Ponte, and Schoeff; Extension Assistant Pudden.

Kansas State University has the only formula feed extension program in the United States designed for the feed manufacturing industry. This extension program, established in 1962, assists personnel in the formula feed and allied industries in: (1) the adoption and use of the latest manufacturing techniques, safety equipment, and practices; and quality-control procedures, marketing methods, and modern management principles and tools, including plant feasibility; and (2) the proper use of drugs and feed additives in animals and manufacturing practices as required by state and federal laws and regulations.

The clientele served are feed manufacturers, retail feed dealers, ingredient and equipment supply firms, milling facility contractors, commercial feedlots, and others involved in the manufacturing, custom mixing, and marketing of commercial feeds.

Educational work also is conducted in: (1) grain marketing in grain quality, grades, inspection, and transportation; and (2) processing and use through milling and baking.

Extension Horticulture

Paul H. Jennings, Head
Frank D. Morrison, State Leader

Professors Jennings, Leuthold, Marr, Morrison, and van der Hoeven; Assistant Professors Gast and Stevens.

Programs in extension horticulture and landscaping are developed to serve persons interested in horticultural plants, including

fruits, nuts, vegetables, flowers, turf, shrubs, and ornamental and shade trees. Special interests may include food products for commercial sales, personal use, environmental improvement, or family gardens.

Assistance is available to suburban, urban, and rural homeowners; and to commercial producers, such as florists, nurseries, greenhouse operators, and fruit, vegetable, and nut growers.

Programs are developed for public and private concerns, such as park departments, schools, cemeteries, municipalities, highway departments, industrial parks, and golf clubs. Youth education programs also are developed relating to the understanding and use of horticultural plants.

Information developed includes selection, production, use, and maintenance of the various horticultural plant materials. Assistance is available in every Kansas county and is given in a variety of ways, including training schools, workshops, demonstrations, publications, slides and scripts, news releases, radio and television programs, and personal contact.

Extension Plant Pathology

Fred W. Schwenk, Head
Douglas J. Jardine, State Leader

Professor Schwenk; Associate Professors Jardine and Tisserat; Instructor O'Mara; Emeritus: Professor King and Willis.

Plant pathology extension specialists keep the people of Kansas informed about the occurrence and nature of plant diseases and the economic means for their control. This includes diseases of field crops, vegetables, fruits, trees, flowers, lawn grasses, and shrubs.

The specialists, working with the county extension agents, furnish plant disease information to rural and urban people by news articles in local papers, radio, television, meetings, field and home visits, and office and phone calls.

The extension specialists are responsible for the plant disease diagnostic laboratory, which provides a service for individuals who have a need for identification and control recommendations for plant diseases. Over 2,000 plant disease specimens are diagnosed annually. This service enables the cooperators to keep abreast of the latest developments in effective chemical recommendation and to utilize materials that are currently registered for use.

Extension Veterinary Medicine

Homer K. Caley, State Leader

Professor Caley; Associate Professor Breedon.

Extension veterinary medicine serves all facets of companion animals and the livestock industry, including veterinarians

as a source of scientific material pertaining to the most recent information on disease prevention and control and proper drug use. Current research is evaluated and adapted for use in these areas.

Research projects and field trials are implemented into the work program so that our livestock interests are provided with actual test results as conditions exist on Kansas farms and ranches.

Extension Home Economics Programs

College of Human Ecology

Marilyn B. Corbin, Assistant Director of Extension, Home Economics Programs

Professors Burke and Smith; Associate Professors Bradshaw, Clarke, Corbin, Jones, Mark, Penner, and Walker; Assistant Professors Aramouni, Ferrell, Phillips, Price, and Young; Emeriti: Professors Allen, Anderson, Carlson, Ellithorpe, Neufeld, Slinkman, and Tucker; Associate Professors Appleby, Atkinson, Brill, Clonts, Howe, Johnson, Schroeder, Wells, H. B. Wiggins, and M. C. Wiggins; Assistant Professors Crist, Guthrie, Miller, and Starkey.

Educational programs designed to improve the quality of living are carried on in each Kansas county under the direction of extension home economics programs.

Program emphases are on: development of children and youth; marital and parental roles; changing roles of men and women; management in allocation of family resources; family financial security; time and money management; consumer performance in the market; nutrition and health; food preparation and preservation; food safety and sanitation; clothing management; textiles; health and safety; hazards in the home and community; home selection, building, buying, and remodeling; housing costs and finance; community factors in housing decisions; furnishing and equipping the home; developing community economic, social, cultural, and human resources, including understanding public concerns affecting families; expansion and improvement of cultural opportunities; and development of leadership abilities.

Each county designs its home economics program according to needs of individuals, families, and communities in the county.

Educational materials are prepared by extension specialists and county extension home economists. Educational programs are carried on through organized study groups, public meetings, individual consultation, self-teaching materials, and the mass media of press, radio, television, and satellite program delivery.

Extension home economics programs are often joint with other extension departments, agencies, and organizations.

Extension Expanded Food and Nutrition Education Program

Marilyn B. Corbin, Assistant Director of Extension, Home Economics Programs

Assistant Professor Stroh.

An educational program in nutrition education for adults and youth from families with limited resources, the program with individual family members and youth is conducted through paraprofessionals who work under the supervision and administration of an extension home economist. The program is conducted in designated counties.

4-H Youth Programs

C. R. Salmon, Assistant Director of Extension

Professor Apel; Associate Professors Adams, Burns, Fisher, Kling, McFarland, and Salmon; Assistant Professor Weaver; Emeriti: Professors Bates, Busset, Eyestone, Johnson, Redman, and Regnier; Associate Professors Borst and Whipps.

Kansas 4-H, Kansas' largest youth education apart from the public schools, is the pre-college level education program of the University, conducted in cooperation with County Extension Councils and the United States Department of Agriculture.

The mission of the Kansas State University 4-H specialists staff and county extension agents is to interpret, extend, and encourage the application of relevant and current information to concerned adults, parents, and community leaders on techniques of working with and relating to children and youth as individuals and in groups so that the children and youth will become self-directing, contributing members of society as they build self-confidence, develop inquiring minds, learn to make decisions, relate to others, and develop a concern for the community and those in it.

Kansas 4-H programs include 113,000 youth 7 to 19 years of age who belong to community clubs and special interest groups, participate in a variety of 4-H events including camps, or enroll in 4-H enrichment programs conducted in cooperation with other community youth-serving agencies and organizations.

The 4-H program is also Kansas' largest adult education program working with youth. County extension council members, numbering 2,520, have the responsibility to identify community youth problems and establish priorities for their solutions. Additionally, nearly 12,000 adults and 5,000 teen volunteers work directly with the 4-H boys and girls throughout the year. Another 15,000 adult volunteers run county 4-H events, promote participation in 4-H programs, and help those adult and teen volunteers who work with the boys and girls directly.

Personnel of numerous other organizations and agencies cooperate in the mission of Kansas 4-H youth programs. First and foremost is the support provided to that mission by Cooperative Extension Service specialists in agriculture, home economics, community development, and information services. Personnel in numerous trade and special interest groups in agriculture and other industry sectors provide a significant amount of promotional, physical, and human resource support. More than 25 full- or part-time Kansas 4-H Foundation staff members help in soliciting contributions to support state 4-H programs, publishing a leader training-oriented magazine with 15,000 circulation 10 times a year, operating two University scholarship houses for 4-H alumni, and providing service and support for one outdoor education facility.

Within each of the Kansas communities, there are: cooperating community agencies and organizations concerned with child and youth development; county fair organizations; and newspapers, radio stations, and community-based cable television systems. Personnel of public and private schools, recreation commission agencies, and other local organizations and groups cooperate in many ways, especially by using the techniques and subjects as extended and advocated by 4-H youth extension personnel.

In each community, Kansas 4-H members were involved in: individual or group projects designed to meet their own interests or needs; service programs to develop responsibility and a sense of caring for the community; one or more meetings to plan, learn, celebrate, or just talk; and tours or trips to learn and broaden their feelings about other people and places. 4-H camps set the stage for learning about nature, developing new skills, having fun with others, and discovering themselves. County fairs include displays of 4-H exhibits and enable 4-H members to compare 4-H projects and tell the 4-H story to the public.

Extension Community Development Programs

William M. Eberle, Assistant Director of Extension

Associate Professors Albright, Bittel, Eberle, and Utermohlen; Assistant Professors Leibhart and Zoellner; Emeritus: Professors Frazier and Norby; Associate Professor Halazon.

The mission of the extension community development programs is to help the people of Kansas communities arrive at group decisions and take actions to enhance their communities as economic, social, service, and living centers. The long-time goal is to help every Kansas community develop the needed leadership and organization skills and the pride and enthusiasm that will, when combined with adequate information and analytical tools, make them more desirable places to live and work.

Major community development education program components include organization and leadership development, economic development, and local government.

The extension community development staff helps communities develop and implement programs in coordination with the five area Extension offices, the 105 county Extension offices, local leaders, civic groups, and local governments. Faculty from several colleges of Kansas State University and other Regents institutions and resource persons from various agencies and the private sector are called upon to provide educational assistance.

Community groups are encouraged and assisted in identifying community needs, setting priorities, and identifying human and economic resources available to solve community's needs to help communities improve themselves.

Kansas PRIDE Program Associate Specialist McAdoo.

The Kansas PRIDE Community Improvement Program is a cooperative effort between government, education, and private industry to empower communities to successfully develop an organizational and leadership structure for community-wide volunteer action for identifying and prioritizing community needs and taking action to make communities better places to live and work. The Kansas PRIDE program is jointly administered by the Kansas State University Cooperative

Extension Service and the Kansas Department of Commerce. The board of directors of Kansas PRIDE, Inc., provides overall program direction. More than half of the state's communities have participated in the program over the past 20 years, with about 100 enrolled each year.

Kansas DIRECT Program

Associate Professor Sisk; Associate Specialists Hobson and Williams.

The Kansas DIRECT Program is a referral and information service providing a single point of contact for individuals needing information or assistance in economic, rural, or business development. The program helps clients by seeking out the best available source of information or assistance at the University, in state government, other institutions or agencies, or in the private sector.

Extension Energy Service

Richard B. Hayter, Director

Professor Hayter; Assistant Professor Nelson; Instructors Gardner, Logan, Matteson, Meyer, Nelson, Snead, and Walter.

The Energy Extension Service provides educational programs for the small energy consumer. This outreach is directed toward four program areas: residential, agricultural, institutional, and small business and industry. Assistance is offered through short courses, technical publications, and on-site visits.

The residential educational programs assist homeowners, tenants, low-income families, and industries serving the residential community. Specialists present educational programs for maintenance personnel, building owners, plant engineers, and designers throughout the state.

Extension Communications

Jack M. Burke, Head

Professors Burke, Graham, and Titus; Associate Professors Atkinson, Buchanan, Daly, Frank, Jorgensen, McGlashon, Peck, Sullins, Ward, and Wright; Assistant Professor Baker; Instructor Ballou; Emeriti Professors Medlin, Thomas, Unruh, and Warner; Associate Professor Dexter; Assistant Professors Knahr, Nelson, and Tennant.

The Department of Extension Communications supports the Cooperative Extension Service, with emphasis on the media. One major objective is to prepare and transmit educational material to the people of the state about extension service programs and Agricultural Experiment Station research. This includes reporting new developments and recommendations in agriculture home economics, 4-H and youth work, public affairs, and community and rural development.

Scientific and general information, as written or produced in popular versions, is channeled through all appropriate means of communication, including newspapers, magazines, publications, circulars and posters, printed annual reports, exhibits, slides, radio, and television.

County extension agents are provided news releases and are trained in using a balanced information program. Information support is provided agents in 105 counties, specialists in the five area extension offices, and state specialists.

A second major objective is to support all state and area extension faculty by providing general editing and printing services related to publications, educational literature, reports, records, forms, and office supplies.

Areas of emphasis include:

Editorial support for developing and printing extension publications

Editorial assistance in preparing training literature, reports, proposals, and other written communications

A duplicating center that provides the rapid reproduction services needed to meet small-quantity and short-notice demands

A distribution center for circulating extension and experiment station publications

Another major objective is to operate an instructional media center and graphics laboratory that makes audiovisual equipment and related services available to extension personnel. A library of motion pictures, slide sets, and video cassettes is maintained. Planning, designing, and preparing audiovisual materials and artwork for specialists working on extension programs is an important phase of the work.

Radio-television-film

Mass communications support is provided to all areas of the Cooperative Extension Service. In radio it administers and programs KKSU, an institution-owned, public radio station which is on the air from 12:30 p.m. to 5:30 p.m., Monday through

Friday on 580 Hz. KKSU is used exclusively for the dissemination of news, information, and cultural programming.

The K-State Radio Network is both a live and audiotape service to Kansas commercial radio stations. Subjects include agriculture, home economics, public affairs, and economic development.

County agents are given training and assistance in planning local radio and television programs.

Live or taped programs are arranged for extension service and other University staff members for use on local Kansas stations.

Television programs showing results of research and demonstrations are planned and presented on cooperating television stations, provided for extension agents and specialists, and delivered via satellite videoconferences. Television training is provided for extension and other University staff members who appear on television or produce video materials.

Extension Computer Systems Office and Weather Data Library

Stephen M. Welch, Coordinator

Professors Brandsberg and Welch, Associate Professor Terry.

The Computer Systems Office supports all extension professionals in their use of computer-based information technology to deliver educational programs and problem-solving techniques to the people of Kansas. The office provides leadership in the adoption of new technology; offers computer support by assessing needs, developing software, supplying training and technical support; encourages computer user groups to share knowledge and skills; and fosters self-sufficiency among computer users.

Included in CSO is the Weather Data Library, which is jointly sponsored by the Cooperative Extension Service and the Agricultural Experiment Station. Its mission is to provide weather/climate data, information, and consultation to extension specialists and station researchers by maintaining a weather/climate database, operating an agricultural weather station network that covers the state, supporting research in the area of weather impacts on the Kansas economy, and serving as liaison with regional and national climate programs.

Personnel and Recruitment

James L. Lindquist, Coordinator

This department is responsible for coordination of the recruitment of county faculty for the Kansas Cooperative Extension Service and the coordination of benefit programs for extension personnel. Support is provided to departments and extension units in the process of filling state and area extension positions.

The recruitment responsibility is accomplished through the development, implementation and maintenance of effective procedures for identifying, recruiting, and hiring qualified faculty. The department is responsible for organizational compliance with affirmative action and equal employment opportunity laws and regulations.

This department provides leadership in establishing and implementing procedures to assist employees with personnel problems and employee benefits. The department coordinates the process for appointments and employee separation and maintains appropriate personnel records for extension separation and maintains appropriate personnel records for extension employees. It is also responsible for the coordination of policies and procedures for classified extension employee position descriptions and performance evaluations.

Planning, Reporting, and Evaluation

Marjory M. Mortvedt, Coordinator

Professor Mortvedt; Emeritus: Professor Ringler

This department provides support and coordination for the planning of programs and the reporting operations of the Kansas Cooperative Extension Service.

The planning function carried out by this department provides coordination for identifying issues at local and University levels; determining preferred plans for interdisciplinary and single discipline educational responses to these issues; preparing written plans; scheduling educational meetings, events, and specialist assistance to counties; carrying out civil rights responsibilities; and providing in-service education in planning, evaluation, and reporting.

Written evaluation/accountability requirements in extension include maintaining accurate records of resource inputs, measured in time; and program outputs, measured in terms of audiences served and benefits to clientele. Both quantitative and qualitative measurement is necessary.

Leadership is given to improving, implementing, and using the management information systems; implementing the statewide reporting process; and submitting written reports as required.

Staff and Organizational Development

C. Stephen Scheneman, Coordinator

Assistant Professor Scheneman; Emeritus Professors Johnson and Prawl.

In order to provide programs which are dynamic, flexible, and responsive to change, extension faculty must be continuously updated with respect to their evolving responsibilities. Special attention must be paid to individual professional improvement and career development needs.

This department provides state-level leadership in orienting new agents and specialists, coordinating in-service education, and developing and maintaining a professional improvement program/record system.

Extension Field Operations

Area extension offices

Five area extension offices are in different parts of the state to place extension staff, including specialists, closer to the counties in which they work. These area offices are in Garden City, Colby, Hutchinson, Manhattan, and Chanute. Extension specialists in the area offices work directly with the county extension agents and local leaders in conducting educational programs specifically fitted to the particular area.

Southwest Research-Extension Center, Garden City

James A. Schaffer, Head
Ray H. Mann, Area Extension Director

Professor Mann; Associate Professors Sloderbeck and Young; Assistant Professors Dhuyvetter, Kreikemeier, Mosier, and Zoellner; Emeriti: Assistant Professor Blankenhagen.

Northwest Research-Extension Center, Colby

Richard S. White, Head
Reba B. White, Area Extension Director

Professor R. S. White; Associate Professor Mikessell; Assistant Professors Ferrell, Houghton, and Nelson; Associate Head R. B. White; Emeritus: Assistant Professor Overlay.

South Central Area Extension Office, Hutchinson

Earl L. Van Meter, Area Extension Director

Professors Bauernfeind and Van Meter; Associate Professor Albright; Assistant Professors Blasi and Phillips; Assistant Forester Atchison; Emeriti: Professor Cox; Associate Professors McReynolds and Wiggins; Assistant Professor Orwig.

Northeast Area Extension Office, Manhattan

Bob W. Newsome, Area Extension Director

Professor Newsome; Associate Professors Mark and Utermohlen; Assistant Professors Devlin and Vandever; Assistant Service Forester New; Emeriti: Professors Figurski and Francis; Instructors Burkhart and Marlow.

Southeast Area Extension Office, Chanute

Benny S. Robbins, Area Extension Director
Professors Brazle, Fausett, Kilgore, and Robbins; Associate Professors Bittel, Bratton, Brazle, Lippert, and Rowland; Assistant Professors Bruckerhoff and Price; Emerita: Associate Professor Appleby.

County extension offices

County extension work takes research information from the University to the people of Kansas to help them solve problems.

There are county extension offices in each of the 105 counties. County extension positions in these offices may include any or all of the following: county extension director, agricultural agent, home economist, 4-H agent, community development agent, and/or horticultural agent. The professional persons holding these positions are joint employees of the County Extension Council and Kansas State University and are members of the KSU faculty.

Local extension professionals also assist local persons in organizing group action to help solve community problems.

University Faculty

AASEN, JOYCE, Instf., English Language Program (1989). BA 1963, U. of Wisconsin; MA 1969, Georgia St. U.; MA 1985, Idaho St. U.

ABELES-ALLISON, LISA C., Asst. Prof. of Horticulture; Extension Specialist, Horticultural Food Marketing (1990). BS 1980, U. of Minnesota-St. Paul; MS 1986, PhD 1990, Michigan St. U.

ABBOTT, JAMES W., Instr., Education (1983). BA 1956, Drury Col.; MA 1959, U. of Missouri; LHD 1980, Concordia Teachers' Col.

ABLE, BILLY V., Prof. of Animal Sciences and Industry; Meat Animal Physiologist, Agr. Exp. Sta. (1970). BS 1962, Oklahoma St. U.; MS 1964, Mississippi St. U.; PhD 1970, U. of Kentucky. (*)

ABMEYER, ERWIN, Asst. Prof. Emeritus of Horticulture (1934). BS 1933, Kansas St. U.

ACASIO, ULYSSES A., Asst. Prof. of Grain Science and Industry (1978). MS 1972, U. of Philippines; PhD 1979, Kansas St. U.

ACKER, DUANE C., Distinguished Prof. of Animal Sciences and Industry; President Emeritus (1962). BS 1952, MS 1953, Iowa St. U.; PhD 1957, Oklahoma St. U.

ACKLEY, R. DOUGLAS, Asst. Controller, Cashiers and Loans (1978). BS 1971, Kansas St. U.

ADAMCHAK, DONALD J., Assoc. Prof. of Sociology (1978). BA 1973, Ohio U.; MA 1975, Western Kentucky U.; PhD 1978, Bowling Green St. U. (*)

ADAMS, ALBERT W., Prof. of Animal Sciences and Industry; Extension Specialist, Poultry Sciences (1962). BS 1951, MS 1955, Kansas St. U.; PhD 1964, South Dakota St. U. (*)

ADAMS, JAMES P., Assoc. Prof.; Extension Specialist, 4-H Youth, (1976). BA 1969, Kansas St. U.; MS 1971, Oklahoma St. U.

ADAMS, MARJORIE, Assoc. Prof. Emerita of English (1954). BA 1941, Louisiana Polytechnic; MA 1948, PhD 1951, U. of Texas. (*)

ADAMS, PATRICIA C., Admin. Asst., Biology (1983). BA 1969, Washburn U.; MBA 1980, Fort Hays St. U.

ADAMS, WILLIAM J., Asst. Prof. of Journalism and Mass Communications (1985). BA 1976, Brigham Young U.; MA 1980, Ball St. U.; PhD 1988, Indiana U.

ADDISON, CONALL E., Co. Extension Agent, Stafford Co., St. John (1974). BS 1966, Tulsa U.; BS 1970, MS 1972, Oklahoma St. U.

ADOLPH, CAROL, Ticket Manager, Intercollegiate Athletics (1955).

AHERN, MICHAEL, Instr. of Marketing (1981). BS 1979, MBA 1981, Kansas St. U.

AINSWORTH, PENNE L., Asst. Prof. of Accounting (1987). BS 1983, MAcc 1984, Kansas St. U.; CPA 1985, Kansas; PhD 1988, U. of Nebraska.

AKIN, JAMES N., Assoc. Dir., Career Planning and Placement Center (1966). BS 1960, MS 1964, Kansas St. U.

AKINS, RICHARD GLENN, Prof. of Chemical Engineering (1963). BS 1957, MS 1958, U. of Louisville; PhD 1962, Northwestern U. (*)

AKKINA, KRISHNA RAO, Assoc. Prof. of Economics (1972). BA 1963, U. of Andhra; MA 1965, Delhi School of Economics; PhD 1972, U. of Minnesota. (*)

ALBERS, LEISA A., Research Asst. of Grain Science and Industry; USDA Grain Marketing Research Lab (1983). BS 1979, Kansas St. U.

ALBRECHT, MARY L., Assoc. Prof. of Horticulture; Research Horticulturist, Floricultural Crops, Agr. Exp. Sta. (1980). BS 1975, Rutgers U.; MS 1977, PhD 1980, Ohio St. U. (*)

ALBRIGHT, KENNETH B., Assoc. Prof.; Extension Specialist, Community Development, South Central (1955). BS 1952, Kansas St. U.; MEd 1967, Colorado St. U.

ALEXANDER, LOREN R., Assoc. Prof. of Modern Languages and Education (1965). BM 1951, Southwestern Col.; MA 1954, Colorado St. Col. of Educ.; MA 1965, PhD 1971, Michigan St. U. (*)

ALFORD, MARION L., Co. Extension Agent, Seward Co., Liberal (1989). BS 1970, Fort Hays St. U.

ALGRIM, EUGENE E., Co. Extension Agent, Agriculture, Rush Co., LaCrosse (1976). BS 1965, MS 1972, Kansas St. U.

ALLEN, DAVID, Chair, Library Automation (1987). BA 1978, MLS 1982, Brigham Young U.

ALLEN, ERIC B., Farm Management Association Fieldman (1973). BS 1971, MS 1972, Kansas St. U.

ALLEN, GERTRUDE E., Prof. Emerita; Extension Specialist, Foods and Nutrition (1929). BS 1923, U. of Minnesota; MS 1936, Kansas St. U.

ALLISON, MAX, Asst. Prof. of Horticulture; Research Horticulturist (1985). BS 1961, U. of Illinois; MS 1976, Kansas St. U.; PhD 1984, Mississippi St. U.

ALLOWAY, JAY E., Assoc. Operating Systems Specialist, Computing and Telecommunications Activities (1970). BS 1970, Kansas St. U.

AMBROSIOUS, MARGERY, Asst. Prof. of Political Science (1986). BA 1964, MA 1967, U. of Illinois; MA 1984, PhD 1986, U. of Nebraska.

AMBURGEY, VICTOR, Research Asst. of Plant Pathology (1983). BS 1983, Kansas St. U.

AMOS, JOHN M., Adjunct Prof., Industrial Engineering (1987). BS 1956, MS 1957, Kansas St. U.; PhD 1960, Ohio St. U.

AMSTEIN, DEANNA, Math Skills Specialist, Academic Assistance Center (1987). BS 1962, Kansas St. U.

AMSTEIN, WILLIAM G., JR., Agr. Alumni and Development Coord. (1986). BS 1952, MS 1957, Kansas St. U.

ANDEREGG, MARVIN K., Co. Extension Agent, 4-H, Labette Co., Altamont (1969). BS 1969, Kansas St. U.

ANDERSON, CATHY L., Assoc. Prof. of Speech (1980). BA 1974, Lyndon St. Col.; MFA 1980, U. of Connecticut.

ANDERSON, DARRYL, Asst. Track Coach (1984). BS 1983, MS 1985, Kansas St. U.

ANDERSON, ELINOR A., Prof. Emerita; Extension Specialist, Family Economics (1963). BS 1939, MS 1952, Kansas St. U.

ANDERSON, KATHLEEN, Asst. Instr. of Animal Sciences and Industry (1987). BS 1981, U. of Nebraska; MS 1986, Texas A&M.

ANDERSON, KELLINE S., Asst. Technical Reporting Specialist, Planning and Evaluation Services (1989). BS 1986, MS 1988, Kansas St. U.

ANDERSON, KENNETH E., Instr. of Animal Sciences and Industry (1983). BS 1979, Southern Illinois U.

ANDERSON, KLING L., Prof. Emeritus of Agronomy (1936). BS 1936, U. of California; MS 1938, Kansas St. U.; PhD 1951, U. of Nebraska.

ANDERSON, NEIL V., Prof. of Comparative Gastroenterology; Clinical Research Scientist (1967). BS 1953, Mankato St. Col.; BS 1959, DVM 1961, PhD 1968, U. of Minnesota; Diplomate 1972, American Col. of Vet. Internal Medicine. (*)

ANDERSON, PHILLIP D., Instr. of Speech (1980). MA 1966, Indiana U.

ANDREWS, MARY ANNE, Administrative Asst., Athletics (1989). BSE 1980, MS 1984, Oklahoma St. U.

ANDREWS, RUSTY, Dir. of Annual Giving, KSU Foundation (1983). BS, Manhattan Christian Col.

ANDRUS, DAVID M., Assoc. Prof. of Marketing (1983). BS 1976, Oklahoma St. U.; MA 1978, U. of Hawaii; PhD 1981, U. of Iowa. (*)

ANDRUS, LYNDA E., Instr. of Art (1983). MFA 1981, U. of Iowa.

ANGLE, DENNIS R., Asst. Prof., Education (1979). BA 1968, MS 1974, Emporia St. U.; PhD 1984, Kansas St. U.

ANNIS, PATTY SMITH, Asst. Prof. of Clothing, Textiles, and Interior Design; Agr. Exp. Sta. (1958). BS 1955, Mississippi St. Col. for Women; MS 1957, U. of Tennessee. (*)

ANSDELL, ORA JOYE, Assoc. Prof. Emerita of English (1946). BS 1932, Kansas St. U.; MA 1939, U. of Michigan; BLS 1946, U. of Chicago; PhD 1956, U. of Colorado. (*)

ANTHONY, HARRY D., Prof. Emeritus of Diagnostic Lab; Research Pathologist (1955). DVM 1952, MS 1957, Kansas St. U. (*)

APEL, J. DALE, Prof.; Extension 4-H Youth Specialist (1962). BS 1950, Kansas St. U.; MS 1961, The American U.; PhD 1966, U. of Chicago. (*)

APPEL, JON A., Asst. Prof. of Plant Pathology (1989). BS 1979, Fort Hays St. U.; MS 1982, Clemson U. Adjunct appt.

APPL, FREDRIC CARL, Prof. of Mechanical Engineering (1960). BS 1954, MS 1955, PhD 1958, Carnegie-Mellon U. (*)

APPLEBY, MARIELLEN J., Assoc. Prof. Emerita; Extension Home Economist, Southeast (1955). BS 1955, Kansas St. U.; MS 1965, U. of Maryland.

APPLEGATE, ROBERTA G., Assoc. Prof. Emerita of Journalism and Mass Communications (1964). AB 1940, Michigan St. U.; MS 1942, Northwestern U.

ARAMOUNI, FADI M., Asst. Prof. of Foods and Nutrition; Extension Specialist, Foods and Nutrition (1989). BS 1977, MS 1980, American U. of Beirut, PhD 1986, Louisiana St. U.

ARCHER, ALLEN W., Asst. Prof. of Geology (1989). BS 1975, Oregon St. U.; AM 1979, PhD 1983, U. of Indiana. (*)

ARCK, WILLIAM, Dir. of Alcohol and Other Drug Education Service (1982). BS 1978, MS 1979, Kansas St. U.

ARGANBRIGHT, MAHALA M., Co. Extension Home Economist Emerita, McPherson Co., McPherson (1949). BS 1931, Kansas St. U.

ARMAGOST, JAMES L., Assoc. Prof. of Speech (1973). BA 1963, U. of California, Santa Barbara; MA 1972, PhD 1973, U. of Washington, Seattle. (*)

ARMBRUST, DEAN V., Assoc. Prof. of Agronomy; Research Soil Scientist, Wind Erosion Research Unit, USDA, ARS (1968). BS 1960, MS 1961, PhD 1973, Kansas St. U. Adjunct appt. (*)

ARNOLD, JO ELLEN, Co. Extension Agent, 4-H, Franklin Co., Ottawa (1977). BS 1977, Kansas St. U.

ARNS, MARK J., Asst. Prof. of Animal Sciences and Industry; Extension Specialist, Horses (1989). BS 1983, U. of Wisconsin; MS 1986, PhD 1989, Texas A&M.

ARTHUR, CHARLES S., Instr. of Accounting (1971). BS 1967, Kansas St. U.; MLL 1970, New York U.

ASLIN, RAYMOND G., Assoc. Prof. of Forestry; St. Forester (1975). BS 1972, MS 1975, U. of Missouri.

ATCHISON, FRED D., Assoc. Prof. Emeritus; Extension Forester, Northeast (1964). BS 1954, U. of Georgia; MS 1972, Fort Hays St. U.

- ATCHISON, ROBERT L.**, Asst. Forester; District Forester, South Central (1990). BS 1981, U. of Missouri.
- ATKINSON, C. HARRY**, Assoc. Prof. Emeritus of Agronomy (1949). BS 1931, MS 1933, Pennsylvania St. U.
- ATKINSON, DAISY E.**, Assoc. Prof. Emerita of Foods and Nutrition; Extension Specialist, Human Nutrition (1959). BA 1938, MS 1953, Iowa St. U.
- ATKINSON, ERIC J.**, Assoc. Prof.; Extension Specialist, Radio and TV (1983). BS 1978, MS 1982, Kansas St. U.
- ATLURU, DURAGRASADARAO**, Temp. Asst. Prof. of Immunopharmacology (1987). BVSc 1971, MVSc 1974, Andhrapradesh Ag. U., India; MS 1980, U. of Minnesota.
- AUEN, LISA M.**, Asst. Scientist of Agronomy (1986). BS 1983, MS 1987, Kansas St. U.
- AVERELL, ROBERT B.**, Adjunct Asst. Prof. of Clothing, Textiles, and Interior Design (1981). BA 1964, U. of Pennsylvania; MS 1969, Rutgers.
- AZER, NAIM ZAKI**, Prof. of Mechanical Engineering (1958). BS 1950, MS 1954, U. of Alexandria, Egypt; PhD 1959, U. of Illinois. (*)
- BABCOCK, MICHAEL W.**, Prof. of Economics (1972). BS, BA 1967, Drake U.; MA 1969, PhD 1973, U. of Illinois. (*)
- BAGLEY, EDGAR SIDNEY**, Prof. Emeritus of Economics (1940). BA 1935, MA 1936, U. of California at Los Angeles; PhD 1950, St. U. of Iowa. (*)
- BAILEY, GERALD D.**, Prof., Education (1972). BS 1966, MEd 1969, EdD 1972, U. of Nebraska. (*)
- BAILEY, GWEN**, Project Coord. of Rural Clearing-house (1985). BS 1969, U. of Nebraska; MS 1973, PhD 1985, Kansas St. U.
- BAILIE, WAYNE E.**, Prof. of Bacteriology; Research Bacteriologist (1972). BS 1957, DVM 1957, PhD 1969, Kansas St. U.; Diplomate 1980, American Col. of Vet. Microbiologists. (*)
- BAKER, JON CHRIS**, Co. Extension Agent, Agriculture, Cowley Co., Winfield (1985). BS 1982, Kansas St. U.; MS 1985, Oklahoma St. U.
- BAKER, LYMAN A., JR.**, Instr. of English (1972). BA 1964, U. of Missouri; MA 1968, Stanford U.
- BAKER, RICHARD P.**, Asst. Prof.; Extension Specialist, Radio and TV (1977). BS 1972, MS 1983, Kansas St. U.
- BALDING, JAMES L.**, Prof. of Grain Science and Industry; Extension Specialist, Formula Feeds Manufacturing (1965). BS 1960, MS 1971, Kansas St. U.
- BALK, DAVID E.**, Asst. Prof. of Human Development and Family Studies (1987). BA 1965, Immaculate Conception Seminary; MA 1970, Marquette U.; PhD 1981, U. of Illinois. (*)
- BALL, HERBERT DEAN**, Prof. of Mechanical Engineering (1958). BS 1952, MS 1958, U. of Nebraska; PhD 1972, Kansas St. U. (*)
- BALLOU, RUSSELL S.**, Instr.; Motion Picture Producer (1973). BS 1971, Kansas St. U.
- BALTZER, BECKI A.**, Fort Riley Counselor and Academic Advisor, Academic Outreach (1988). BA 1968, Kent St. U., MA 1970, Ohio St. U.
- BANBURY, EVANS E.**, Prof. Emeritus, Colby Branch Agr. Exp. Sta. (1946). BS 1940, Kansas St. U.
- BANDYK, CATHRYN A.**, Research Asst., International Grains Program, Grain Science and Industry (1982). BS 1982, MS 1986, Kansas St. U.
- BANKS, MARGARET K.**, Asst. Prof. of Civil Engineering (1989). BS 1982, U. of Florida; MS 1985, U. of North Carolina; PhD 1989, Duke U.
- BARBER, ARNOLD V.**, Co. Extension Agricultural Agent Emeritus, Atchison Co., Effingham (1955). BS 1934, U. of Missouri.
- BARK, LAURENCE DEAN**, Prof. Emeritus of Physics; Climatologist, Agr. Exp. Sta. (1956). BS 1948, MS 1950, U. of Chicago; PhD 1954, Rutgers U. (*)
- BARKER, DIANE**, Asst. (Transcript) Specialist (1986). BA 1974, MA 1986, Kansas St. U.
- BARKLEY, ANDRE P.**, Asst. Prof. of Agricultural Economics, Agriculture and Public Policy (1988). BA 1984, Whitman Col., Wash.; MA 1986, PhD 1988, U. of Chicago.
- BARKLEY, THEODORE M.**, Prof., Division of Biology; Curator of the Herbarium; Taxonomist, Agr. Exp. Sta. (1961). BS 1955, Kansas St. U.; MS 1957, Oregon St. U.; PhD 1960, Columbia U. (*)
- BARNABY, G. A. (ART), JR.**, Prof. of Agricultural Economics; Extension Agricultural Economist, Farm Management (1979). BS 1973, Fort Hays St. U.; MS 1976, New Mexico St. U.; PhD 1979, Texas A&M.
- BARNES, ALTON A.**, Prof. of Landscape Arch. and Planning (1967). BLA 1965, U. of Georgia; MLA 1968, U. of Illinois. Registered Landscape Architect. (*)
- BARNES, HELEN L.**, Co. Extension Home Economist Emerita, Linn Co., Mound City (1964). BS 1949, U. of Missouri.
- BARNES, HOWARD**, Asst. Prof. of Human Development and Family Studies; Agr. Exp. Sta. (1985). BA 1972, Macalester Col.; MS 1980, Kansas St. U.; PhD 1985, U. of Minnesota. (*)
- BARNES, JOHN H.**, Co. Extension Agricultural Agent Emeritus, Harvey Co., Newton (1953). BS 1951, Kansas St. U.
- BARNES, PHILIP L.**, Asst. Prof. of Agricultural Engineering (1980). BS 1974, U. of Wyoming; MS 1977, PhD 1980, Texas A&M.
- BARNETT, FRANCIS L.**, Prof. of Agronomy; Forage Research Geneticist, Agr. Exp. Sta. (1956). BS 1952, McGill U., Canada; MS 1954, PhD 1956, Pennsylvania St. U. (*)
- BARNETT, MARK A.**, Prof. of Psychology (1975). BA 1971, PhD 1975, Northwestern U. (*)
- BARNHILL, CLAUDE A.**, Adjunct Asst. Prof. of Foods and Nutrition (1989). BS 1953, MD 1956, U. of North Carolina.
- BARR, MICHAEL G.**, Adjunct Instr. of Dietetics (1987). BS 1978, U. of Texas at Austin; MS 1981, Southwest Texas St. U.
- BARROWS, R. SCOTT**, Co. Extension Agent, Agriculture, Ness Co., Ness City (1990). BS 1984, Kansas St. U.
- BARTEL, ROY A.**, Assoc. Prof. Emeritus, Education (1963). AB 1942, Bethel Col.; MSE 1949, EdD 1959, U. of Kansas.
- BARTLETT, CLARENCE E.**, Instr. Emeritus; Extension Economist, Farm Management (1947). BS 1929, U. of Nebraska.
- BARTON, DAVID G.**, Prof. of Agricultural Economics; Agricultural Economist, Business Management (1976). BS 1967, Utah St. U.; MS 1970, PhD 1974, Purdue U.
- BARTON, SUSAN**, Telecommunications Administrator, TELENET (1988). BA 1988, Kansas St. U.
- BARTON-DOBENIN, JOSEPH**, Prof. Emeritus of Management (1958). BS 1956, MA 1958, PhD 1966, U. of Nebraska. (*)
- BARTZ, JACQUELYN**, Adjunct Instr. of Dietetics (1975). BS 1965, MS 1967, Ohio St. U.
- BASCOM, CHARLES H.**, Staff Physician, Lafene Health Center (1981). MD 1956, U. of Kansas Medical School.
- BASCOM, MARCIA SLOAN**, Instructor of Landscape Arch (1989). BLA 1987, Kansas St. U.; Registered Landscape Architect.
- BASHAM, EDWIN**, Instr., Computing and Information Sciences (1976). BS 1946, U.S. Military Academy; MS 1959, Georgia Inst. of Tech.
- BASSETT, LOUIS I.**, Asst. Prof. of Philosophy (1989). BA 1976, MA 1978, U. of Alberta; PhD 1985, U. of Toronto. (*)
- BASSETTE, RICHARD**, Prof. Emeritus of Animal Sciences and Industry; Dairy Foods Research Chemist, Agr. Exp. Sta. (1958). BS 1952, MS 1955, PhD 1958, U. of Maryland.
- BATES, CHARLES T.**, Prof. Emeritus; Extension Specialist, 4-H Programs (1956). BS 1951, Oklahoma A&M; MS 1960, U. of Wisconsin.
- BATES, DOUGLAS**, Documents Librarian (1988). BS 1983, MLS 1987, Brigham Young U.
- BATES, HERBERT TEMPLETON**, Prof. Emeritus of Chemical Engineering (1958). BS 1935, Iowa St. U.; MS 1938, Virginia Poly. Inst.; PhD 1941, Iowa St. U.; Professional Engineer, 1959.
- BAUERLE, CAROL A.**, Co. Extension Agent, Brown Co., Hiawatha (1979). BS 1979, Kansas St. U.
- BAUERNFEIND, ROBERT J.**, Prof. of Entomology, Extension Specialist, Entomology, South Central (1978). BS 1967, MS 1976, PhD 1978, U. of Wisconsin.
- BAUGHER, EARL EUGENE**, Assoc. Prof. of Agricultural Engineering (1967). BS 1958, MS 1964, Kansas St. U.
- BEATTY, DANIEL D.**, Prof. and VP Emeritus for Business Affairs (1956). AB 1947, Hope Col.; MBA 1949, U. of Michigan.
- BECHTEL, DONALD B.**, Adjunct Asst. Prof. of Biology; Research Biologist, Grain Marketing Research Center (1983). BS 1971, MS 1974, Iowa St. U.; PhD 1982, Kansas St. U.
- BECK, B. TERRY**, Assoc. Prof. of Mechanical Engineering (1979). BS 1971, MS 1974, PhD 1978, Oakland U. (*)
- BECK, GLENN H.**, VP Emeritus for Agriculture (1936). BS 1936, U. of Idaho; MS 1938, Kansas St. U.; PhD 1950, Cornell U.
- BEECH, DOUGLAS F.**, Instr. of Agricultural Economics; Extension Agricultural Economist, Farm Management (1979). BS 1972, MS 1976, Cornell U.
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- BROCE, ALBERTO B.**, Prof. of Entomology; Research Entomologist, Veterinary Entomology, Agr. Exp. Sta. (1979). BS 1965, MS 1967, PhD 1971, U. of Florida. (*)
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- HALAZON, GEORGE C.**, Assoc. Prof. Emeritus; Extension Specialist, Wildlife and Outdoor Recreation (1954). PhB 1943, MS 1950, U. of Wisconsin.
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- HENSON, DARL W.**, Co. Extension Agent, Agriculture, Grant Co., Ulysses (1983). BS 1978, Fort Hays St. U.
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- HICKS, ARLAND V.**, Adjunct Prof. of Civil Engineering (1988). BS 1954, Kansas St. U.; MS 1968, U. of Missouri, Columbia; PhD 1977, U. of Kansas.
- HIGGINS, JAMES J.**, Prof. of Statistics; Consultant, Ag. Exp. Sta. (1980). BS 1965, U. of Illinois; MS 1967, Illinois St. U.; PhD 1970, U. of Missouri-Columbia. (*)
- HIGGINS, MARY L.**, Adjunct Asst. Prof. of Foods and Nutrition (1985). BS 1975, MS 1979, PhD 1982, Iowa St. U.
- HIGGINS, RANDALL A.**, Assoc. Prof. of Entomology; Extension St. Leader, Entomology (1982). BS 1976, Purdue U.; MS 1978, PhD 1982, Iowa St. U. (*)
- HIGGINSON, FRED H.**, Prof. Emeritus of English (1950). AB 1942, MA 1947, U. of Wichita; PhD 1953, U. of Minnesota. (*)
- HIGHAM, BARBARA C.**, Instr. of Economics (1974). BA 1948, Mt. Holyoke; MA 1950, Columbia U.
- HIGHAM, ROBIN.** Prof. of History (1963). AB 1950, Harvard Col.; MA 1953, Claremont Grad. School; PhD 1957, Harvard U. (*)
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- HILL, RANDALL CONRAD.** Prof. Emeritus of Sociology (1929). BS 1924, MS 1927, Kansas St. U.; PhD 1929, U. of Missouri. (*)
- HINES, ROBERT H.**, Prof. of Animal Sciences and Industry; Swine Research Scientist, Agr. Exp. Sta. (1966). BS 1957, Purdue U.; MS 1961, PhD 1966, Michigan St. U. (*)
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- HOBBBS, JAMES A.**, Prof. Emeritus of Agronomy; Soil Management Research Scientist, Agr. Exp. Sta. (1950). BS 1935, MS 1940, U. of Manitoba, Winnipeg; PhD 1948, Purdue U. (*)
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- MILLS, ROBERT B.**, Prof. Emeritus of Entomology; Research Entomologist, Stored Product Insects, Agr. Exp. Sta. (1963). BS 1949, Kansas St. U.; MEd 1953, U. of Colorado; PhD 1964, Kansas St. U. (*)
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- STAMEY, WILLIAM L.**, Dean Emeritus; Prof. of Mathematics (1953). AB 1947, U. of North Colorado; MA 1949, PhD 1952, U. of Missouri. (*)
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