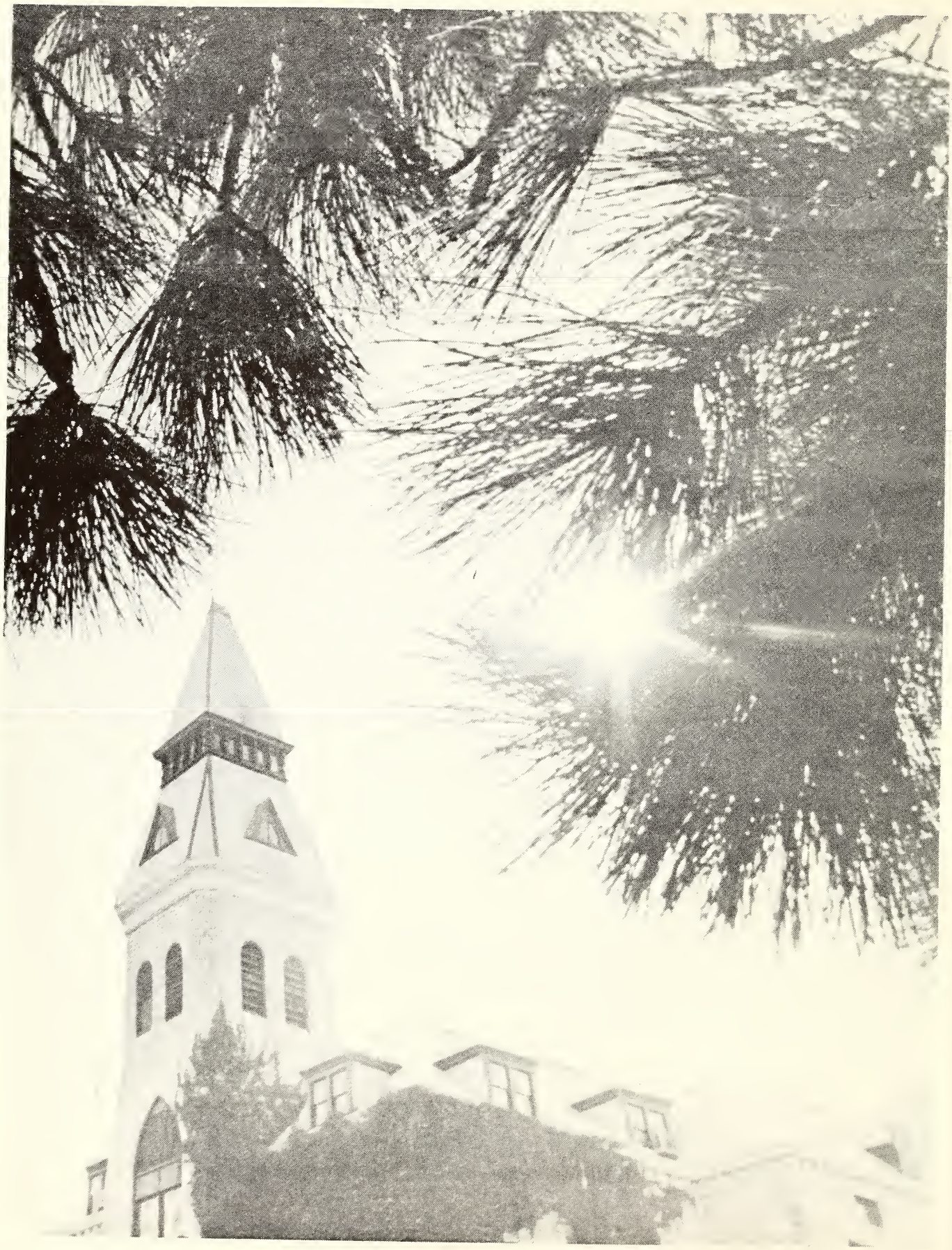


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Kansas State University Bulletin

GENERAL CATALOG 1978-1979



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Kansas State University Bulletin

General Catalog 1978-79

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John J. Conard, Topeka, Executive Officer

Information

You may call **toll-free** from any place in Kansas for information about Kansas State University. Dial 1-800-432-8270 24 hours a day. After 8:00 p.m. your call will be recorded and returned the next working day. The University's main switchboard telephone number is 913-532-6011.

Prospective undergraduate students should communicate with the Dean of Admisssions and Records in 118 Anderson Hall, phone 913-532-6250.

Prospective graduate students should communicate with the Dean of Graduate School in 101 Fairchild Hall, phone 913-532-6191.

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Kansas State University is committed to a policy of non-discrimination on the basis of race, sex, national origin, handicap, or other non-merit reasons, in admissions, educational programs or activities, and employment, all as required by applicable laws and regulations. Inquiries may be addressed to: Director, Affirmative Action Office, Kansas State University, 207 Fairchild Hall, Manhattan, Kansas 66506, 913-532-6220 or Director, Office of Civil Rights, HEW, Washington, D.C. 20201.

KANSAS STATE UNIVERSITY BULLETIN

Volume 62 June 1978 Number 1

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Calendar

Fall Semester, 1978

August 23-25, Wednesday-Friday
Enrollment and registration of all students, including physical examinations, testing and orientation.

August 28, Monday
Classes begin. Late fee, $10.00 for enrollment.

September 4, Monday
Labor Day. No classes.

September 8, Friday
Last day to enroll without dean's permission.

September 11-22, Monday-Friday
Sign-up for credit, no-credit grading option.

September 25, Monday
20th class day, late fee $25.00 for subsequent enrollment. Last day for applications for December graduation be in dean's offices.

October 6, Friday
Last day to withdraw and receive a partial refund.

October 9, Monday
Tentative copies of doctors' dissertations, with abstracts, due in major professor's office. Approval forms may be obtained in graduate dean's office.

October 13, Friday
Mid-semester grade reports due in Admissions and Records.

October 17, Tuesday
Tentative copies of masters' theses and reports, with abstracts, due in major professor's office. Approval forms may be obtained in graduate dean's office.

October 27, Friday
Last day to drop course without a WP or WF being recorded.

October 30-November 10, Monday-Friday
Early enrollment for Spring Semester.

November 1, Wednesday
Dissertation approval forms due in graduate dean's office.

November 8, Wednesday
Masters' approval forms due in graduate office. Non-thesis, non-report approval forms due on the same date as thesis and report approval forms.

November 9, Thursday
Final date of doctors' oral examinations.

November 15, Wednesday
Final date of masters' oral examinations for candidates writing a thesis or report.

November 20, Monday
Final copies of doctors' dissertations due in graduate dean's office.

November 21, Tuesday
10 p.m. Thanksgiving student recess begins.

November 27, Monday
Final date of masters' orals for candidates on non-thesis, non-report plan.

November 27, Monday
Classes resume.

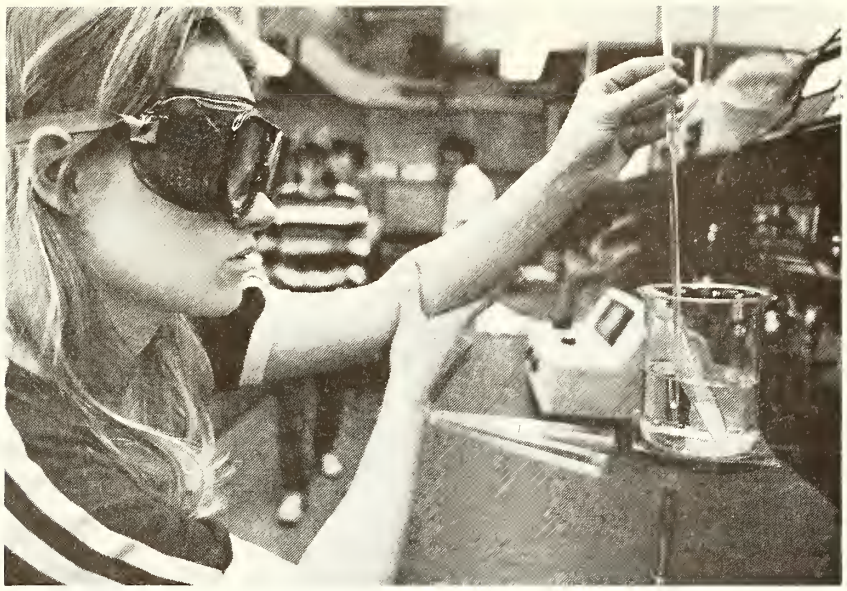
December 1, Friday
Last day course may be dropped before end of semester.

December 5, Tuesday
Final copies of masters' theses and reports due in graduate dean's office.

December 18-22, Monday-Friday
Semester examinations for all students.

December 26, Tuesday Noon
Deadline for grades to Admissions and Records.

January 2-16
January Intersession



Spring Semester, 1979

January 15-16, Monday-Tuesday
Registration of all students, including physical examinations, testing and orientation.

January 17, Wednesday
Classes begin. Late fee $10.00 for enrollment.

January 26, Friday
Last day to enroll without dean's permission.

February 5-16, Monday-Friday
Sign-up for credit, no-credit grading option.

February 13, Tuesday
20th class day, late fee $25.00 for subsequent enrollment.

February 16, Friday
Last day for applications for May graduation to be in dean's offices.

February 23, Friday
Last day for students to withdraw and receive a partial fee refund.

March 2, Friday
Mid-semester grade reports due in Admissions and Records.

March 7, Wednesday
Tentative copies of doctors' dissertations, with abstracts, due in major professor's office. Approval forms may be obtained in graduate dean's office.

March 10, Saturday Noon
Spring break begins.

March 19, Monday
Classes resume.

Tentative copies of masters' theses and reports, with abstracts, due in major professor's office.

March 23, Friday
Last day to drop course without a WP or WF being recorded.

March 30-31, Friday, Saturday
All-University Open House

April 2-13, Monday-Friday
Early enrollment for Fall Semester.

April 5, Thursday
Dissertation approval forms due in graduate dean's office.

April 11, Wednesday
Masters' approval forms due in graduate office for masters candidates. Non-thesis, non-report approval forms due on the same date as thesis and report approval forms.

April 13, Friday
Final date of doctors' oral examinations.

April 16, Monday
Holiday. No classes. Easter is April 15.

April 18, Wednesday
Final copies of doctors' dissertations due in graduate dean's office.

April 20, Friday
Final date of masters' oral examinations for candidates writing a thesis or report.

April 25, Wednesday
Final date of orals for candidates on the non-thesis, non-report plan.

April 26, Thursday
Final copies of masters' theses and reports due in graduate dean's office.

April 27, Friday
Last day a course may be dropped before end of semester.

May 14-18, Monday-Friday
Semester examinations for all students.

May 18, Friday
Commencement.

May 21, Monday Noon
Deadline for grades to Admissions and Records.

May 21-June 1
May Intersession.

SUMMER TERM 1979

June 4-July 27
Sessions of eight, three and one week's duration.

General Information

The University

The University, founded February 16, 1863, was 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 315-acre campus is in northern Manhattan, convenient to both business and residential sections. Most 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 Lake, one of the largest in the Midwest.

Beyond the campus is more than 4,000 acres of University land used for experimental work in agriculture.

The five branches of the Agricultural Experiment Station are at Hays, Colby, Garden City, Mound Valley, and Tribune, include 6,000 acres plus a number of outlying experimental fields. Altogether research through the Agricultural Experiment Station involves more than 11,000 acres.

Objectives of the Educational Program at Kansas State University

The objectives of the educational program at Kansas State University are to develop individuals capable of applying an 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 while at the University. Specifically, this means to:
   1. Learn and make known to students before they enroll all that is possible and useful about their interests, aptitudes, and abilities.
   2. Apply that knowledge to the students' choice of courses and curriculums as fully as possible without encroaching harmfully on their initiative and feeling of self-responsibility.
   3. Provide continuing guidance for students according to their needs.

II. To prepare students adequately in a technical sense for an occupation or a profession which includes an organized body of information and theory so that they may realize their creative potentialities in the field of their choice. More specifically this means that students should acquire:
   1. The ability to recognize and master fundamental principles in their fields of specialization.
   2. The knowledge basic to their special fields of study.
   3. The ability to reason critically from facts and recognized assumptions to useful technical conclusions.
   4. The basic skills associated with their fields of study.
   5. A professional attitude in their chosen work.

III. To provide all students with an opportunity to gain the knowledge and abilities which members of a democratic society, relative to their capabilities, need to possess in common, whatever occupation or profession they expect to enter. Specifically, this means that through its total program the University undertakes to help the student to:
   1. Develop communication skills.
   2. Develop the ability to apply critical and creative thinking to the solution of theoretical and practical problems.
   3. Understand the basic concepts of the natural sciences, the interrelations of the natural and social sciences, and the impact of science on society.
   4. Comprehend and evaluate the processes and institutions in society at home and abroad, and develop a dynamic sense of personal responsibilities as effective citizens in a democratic society.
   5. Develop habits of self-evaluation, responsibility, and enterprise which will increase the effectiveness of the educative process in college, and provide the basis for continued self-improvement.
   6. Develop a well-adjusted personality, good character traits, and a sound philosophy of life.
   7. Prepare for effective participation in family life.
   8. 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 which 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 K-State is transferable to other institutions.

Admission

Students interested in attending Kansas State University should write to the Admissions Office for an application form. The student should complete the form and return it to the Admissions Office. All correspondence about admission should be addressed to this office.



Admissions Counseling

The Admissions Office is open weekdays from 8:00 a.m. to 11:50 a.m. and from 1:00 p.m. to 5:00 p.m. during the academic year for admissions counseling. Campus offices are closed Saturdays and Sundays.

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

The Admissions Office is in the center of the main administration building, Anderson Hall.

High School Graduates

Residents of Kansas who graduate from an accredited Kansas high school are admitted to Kansas State University. Out-of-state applicants are expected to have a strong academic rank in class and to have made good scores on the American College Test battery.

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

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

High School Prerequisites

Entering freshmen should have completed the high school mathematics courses which are a necessary prerequisite for their curriculum as listed below. The capital letters correspond to the section on undergraduate degrees. See pages 14-15.

(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) Two units of algebra or one unit of algebra and one unit of geometry, or approved substitute for home economics.

(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.

In addition, entering freshmen should have completed at least three units of high school English and one unit of high school science.

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 to Kansas and out-of-state transfer students.

Most credits from junior and senior colleges and universities are transferable to K-State. Transcripts of record should be sent to the Admissions Office directly from each institution previously attended. Unofficial transcripts and grade summaries should not be submitted by the student since these are not acceptable. Only one-half of the hours required for a KSU degree can be taken at a two-year college.

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

American College Test (ACT)

Freshman applicants to KSU are required to take the ACT and 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.

Advanced Placement Examinations

Students who have completed one of the College Entrance Examination Board Advanced Placement Tests should have a report of their scores sent to the director of admissions at Kansas State University. College Board Advanced Placement Tests are given in May of the senior year in high schools offering advanced placement courses. Subjects include American history, biology, chemistry, English, European history, French, German, Latin 4, Latin 5, mathematics, physics and Spanish. Credit is given for scores of 5, 4, or 3. Scores of 2 are referred to the appropriate department head for review. No credit is given for scores of 1.

Late Admission

A student who seeks to enter the University later than ten calendar days after the start of the semester is admitted only by special permission of the dean. Those who enroll after the regular registration period and prior to the 20th day of class pay a late enrollment fee of $10.00. University staff members, including graduate assistants and graduate research assistants and teachers employed in elementary and secondary schools, do not pay this fee. However, anyone enrolling after the 20th day of class must pay a $25.00 late enrollment fee.

Enrollment

New student enrollment for the fall semester takes place in late May and June. Admitted students are scheduled during specific days during this period. Those who aren't able to participate in the scheduled sessions are able to drop in to the New Student Programs Office of the Center for Student Development in Holtz Hall anytime during June or July and complete their enrollment. New students also may enroll during the August registration period or may take advantage of a mail enrollment option.

New Student Advisement

All new students are assigned faculty advisers at the beginning of the school year. These advisers are available to them any time they need help. Faculty advisers assist students in defining goals to be reached in college, give information regarding appropriate curriculums and courses, and discuss personal problems students may have, especially problems related to the student's progress and plans for subsequent work.

Medical History

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

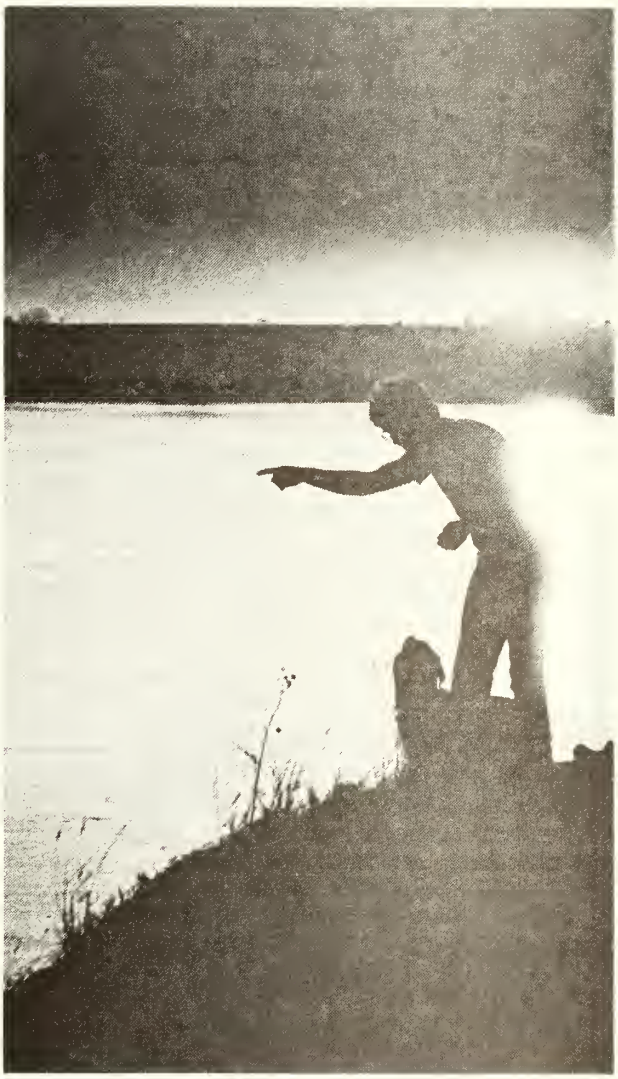
Special Students

A special student is one not regularly enrolled in work for a degree. Special students are expected to meet the same admission requirements as regular students. Students who will enroll for only a few courses may wish to apply under this category.

Under certain circumstances, outstanding high school students are admitted for the summer only as special students to take several courses between their junior and senior years. To be considered for such admission, students must have the recommendation of their high school principal and have an outstanding high school academic record.

Adults who are not high school graduates are sometimes admitted as special students 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.

Special 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.



Extension and Correspondence Credit

College-level credit earned through accredited extension divisions may be applied toward credit requirements for a degree at this institution. The credit must be applicable to the curriculum chosen and the amount of such credit which can be used is limited. 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 Examination

Students who take the College Level Examination Program tests should have the results sent to the Office of Admissions and Records for departmental review and credit recommendation.

Any student who is enrolled at KSU is eligible to gain undergraduate credit by examination. Credit may be granted for any course with the consent of the head of the department offering credit for that subject.

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. Non-graded credit by examination shall be treated as graded hours in implementing credit/no credit policy.

Service School Credit For Veterans

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.

Assignment to Classes

Students are responsible for fulfilling all requirements of the curriculum in which they are enrolled. They should consult with their adviser or their dean in planning their work. Students should be familiar with the *General Catalog* statements about assignments and curricula, because the catalog is the official source of information.

Catalogs are maintained for student use in the Admissions Office, all deans' offices, the library, and all departmental offices. If a student wishes a personal copy, it may be purchased at the K-State Union Bookstore.

No student can be enrolled in classes or for private lessons in music or other subjects before getting an assignment. **No assignment is complete until all fees and charges are paid.**

Registration and assignment of courses take place as shown on the calendar on pages 2 and 3 of this catalog. Later assignments to courses are made during regular office hours by the student's dean or adviser. A student may not enroll later than ten class days after the beginning of a semester (five days for summer session) except by permission of the dean. Students should enroll during the regularly scheduled registration periods in order to avoid penalty fees.

A student may not enroll for more than 18 hours including correspondence and extension study unless granted permission to do so by the dean or dean's representative. However, if the normal assignment in a curriculum is 18 hours, a student may enroll for one additional hour without special permission.

A student whose grades were "B" or better during the preceding semester, and who did not have a deficiency of any kind in that period, may ask to take additional hours. In no case may the total assignment, including correspondence and extension work, exceed 21 hours.

A non-graded class is one in which no traditional "letter grade" is given. The grades of Cr (credit) and NCr (no credit) are given.

A regularly enrolled student must have the permission of the dean to take correspondence or extension courses while enrolled and these are counted as part of the student's semester load.

Dropping and Adding Courses

No student may drop a course or change an assignment except by a formal reassignment by the dean or dean's representative.

If an instructor recommends a reassignment, a student should confer with his adviser.

The last day for dropping a course without a WP or WF being recorded is at the end of the ninth week of classes. During the last two weeks of classes, courses may not be dropped.

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

Retake Policy

Students may retake courses taken in an earlier semester in order to improve the grade. If a course is retaken, the original grade is lined out, a retake notice inserted, and removed from the grade point average. 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 a credit-no credit basis if appropriate or if originally taken on a credit-no credit 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. There is no limit to the number of courses that can be retaken or the number of times a particular course can be retaken.

Credit-No Credit Policy

An undergraduate student may take any course, outside his major field of study for which he possesses normal prerequisites or for which he has the permission of the instructor to enroll, on a credit-no credit basis. Each department or division may specify which courses its majors may take on a credit-no credit basis. Departments or divisions may offer courses in any of the following ways: letter grade only; letter grade or credit-no credit; credit-no credit only.

At least 5/6 of the credit hours taken at KSU and applied toward a bachelors degree must be graded hours. Required courses of an internship or practicum nature, offered on a credit-no credit basis only, are to be considered as graded hours in the implementation of this policy.

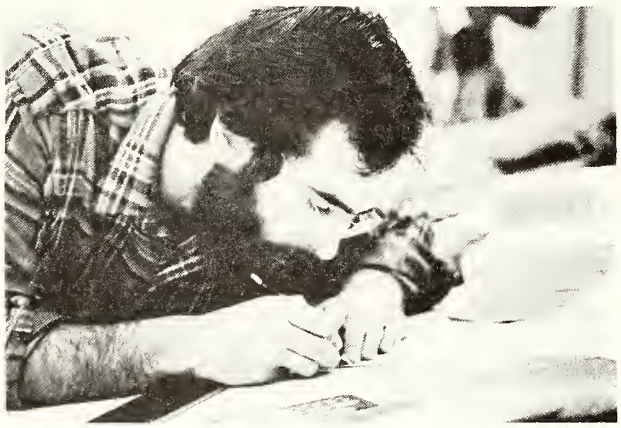
When the student makes the decision to enroll on a credit-no credit basis during the 3rd and 4th weeks of the semester no change in the option can later be made. A course which was completed on a credit-no credit basis may not be converted to a graded course to meet some future major field requirement.

For courses taken on a credit-no credit basis letter grades of D and above will be designated credit. Letter grades of F will be designated no credit.

Class Attendance

Class attendance policies shall be determined by the instructor of each course. Instructors are

strongly encouraged to adopt a policy of optional attendance. 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 dean.

If a student withdraws during the first nine weeks of the semester, no mark shall be reported to the Director of Records. Thereafter, a mark of WP is reported in all courses in which the student is passing, and WF is reported for courses in which satisfactory work has not been done. A student may not withdraw during the last two weeks of classes.

Auditing Classes

Auditing is attending a class regularly without participating in class work and without receiving credit. Permission to audit a class is granted by the dean of the college in which the class is offered. A nonrefundable fee of $1 a semester hour is charged each auditor except full-time University faculty members, employees, and full-time students. Laboratory and activity courses may not be audited.

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
Cr, for credit in courses for which no letter grade is given, (non-graded courses)
NCr, for no credit in courses for which no letter grade is given, (non-graded courses)
WP, for withdrawn passing
WF, for withdrawn failing

The report I (incomplete) is used at the discretion of the instructor when a student may have further time to complete the required work.

Hours taken on a non-graded basis will be graded by Cr, if passed, or NCr, if not passed. Courses in which a Cr grade is received will be used in fulfilling graduation requirements. Only the grades A, B, C, D, F and WF are used in calculating resident grade averages.

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.

A student whose semester grade in any subject is "A" may be excused from the final examination in that subject at the discretion of the instructor.

Permission for special examinations in subjects not taken in class, or for advanced credit, or to make up failures, must be obtained, on recommendation of the department head in which the course is given, from the dean of the college in which the student is enrolled. 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. A special examination may be given only to a student who has enrolled at KSU, and credit earned is considered resident credit.

Report Of Grades

Mid-semester grade reports for new freshmen are sent to deans' offices and to students at the close of the 7th week of classes.

Other students desiring reports of grades must supply instructors with properly self-addressed official cards, with postage affixed, after the seventh Saturday of the semester or with their final examination papers. Instructors send reports so requested to the students or to student organizations.

The instructor reports semester grades, based on the examination and class work, to the director of records.

If a student drops a subject after the ninth week of classes, a mark of either WD or WF is reported, depending on whether the student was passing or failing at the time of dropping the subject. No course may be dropped after the date marking the close of this privilege as shown on the academic calendar. 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, no semester grade is reported until the reason for such absence has been learned; the instructor reports a mark of I for Incomplete. If the student's absence is not excused by the dean, a semester grade is reported on the basis of zero for the final examination; but if the absence is excused, a reasonable time, usually not over one month, is allowed within which the examination may be taken.

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

Points

For each semester hour of graded work, a student earns points according to the grades he makes, as follows: A, 4; B, 3; C, 2; D, 1; F, 0; WF, 0.

Scholastic Deficiencies

Probation, Dismissal. A student's Kansas State University academic record of resident work is used to establish probation or dismissal status.

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

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

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

Students with less than 60 resident hours completed are placed on probation if their grade-point average drops more than five (5) points below a 2.0 (C) overall or semester average. Students with more than 60 resident hours completed are placed on probation if their grade-point average is less than 2.0 (C) overall or semester average.

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

Students may be dismissed if they have completed 20 or more semester hours of resident graded course work and have been on probation the previous semester. A student's overall average must be more than 18 grade-points below a 2.0 (C) to be dismissed. No student with a grade-point average of 1.85 or above will be dismissed.

Consult the chart on the next page for exact information concerning probation and dismissal.

Reinstatement. Dismissed students will be readmitted only when approved for readmission by the academic standards committee of the college they are attempting to enter. Normally students must wait at least one semester before they will be considered for readmission.

The application for reinstatement must be di-

Scholastic Deficiencies Chart

Hours Completed	Grade Points Probation Less than	Grade Points Dismissal Less than
3	1	—
4	3	—
5	5	—
6	7	—
7	9	—
8	11	—
9	13	—
10	15	—
11	17	—
12	19	—
13	21	—
14	23	—
15	25	—
16	27	—
17	29	—
16	31	—
19	33	—
20	35	22
21	37	24
22	39	26
23	41	26
24	43	30
25	45	32
26	47	34
27	49	36
28	51	38
29	53	40
30	55	42
31	57	44
32	59	46
33	61	46
34	63	50
35	65	52
36	67	54
37	69	58
38	71	58
39	73	60
40	75	62
41	77	64
42	79	66
43	61	88
44	83	70
45	85	72
46	67	74
47	89	76
48	91	76
49	93	80
50	95	82
51	97	84
52	99	86
53	101	88
54	103	90
55	105	92
58	107	94
57	109	96
58	111	98
59	113	100
60	2.0 GPA	102
61	2.0 GPA	104
62	2.0 GPA	106
83	2.0 GPA	108
64	2.0 GPA	110
65	2.0 GPA	112
66	2.0 GPA	114
67	2.0 GPA	116
88	2.0 GPA	116
69	2.0 GPA	120
70	2.0 GPA	122
71	2.0 GPA	124
72	2.0 GPA	126
73	2.0 GPA	126
74	2.0 GPA	130
75	2.0 GPA	132
76	2.0 GPA	134
77	2.0 GPA	136
78	2.0 GPA	138
79	2.0 GPA	140
80	2.0 GPA	142
61	2.0 GPA	144
82	2.0 GPA	146
83	2.0 GPA	148
84	2.0 GPA	150
85	2.0 GPA	152
86	2.0 GPA	154
67	2.0 GPA	156
88	2.0 GPA	158
89	2.0 GPA	160
90	2.0 GPA	162
91	2.0 GPA	164
92	2.0 GPA	166
93	2.0 GPA	168
94	2.0 GPA	170
95	2.0 GPA	172
96	2.0 GPA	174
97	2.0 GPA	176
96	2.0 GPA	178
99	2.0 GPA	180
100	2.0 GPA	182
101	2.0 GPA	184
102	2.0 GPA	186
103	2.0 GPA	188
104	2.0 GPA	190
105	2.0 GPA	192
106	2.0 GPA	194
107	2.0 GPA	196
108	2.0 GPA	198
109	2.0 GPA	200
110	2.0 GPA	202
111	2.0 GPA	204
112	2.0 GPA	206
113	2.0 GPA	208
114	2.0 GPA	210
115	2.0 GPA	212
116	2.0 GPA	214
117	2.0 GPA	216
116	2.0 GPA	216
119	2.0 GPA	220
120 or	2.0 GPA	1.85 GPA

rected to the academic standards committee of the specific college of the University in which the student wishes to enroll.

Students who earn a "C" (2.0) or better average on 12 or more credits during the semester they are dismissed can be considered for immediate reinstatement.

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 their college graduating class are designated "Magna Cum Laude." Those remaining in the upper ten per cent are graduated "Cum Laude."

For the unofficial Commencement Program, honors will be determined on a minimum of 45 hours in residence completed prior to the term of graduation with at least 36 credit hours in graded courses.

The "Cum Laude" grade point average for graduation honors in May will be used in the succeeding summer and fall terms to determine semester honors on a minimum of 12 undergraduate semester hours of graded KSU course work.

Graduate School students are ineligible for these honors.

Student Records

Students and former students are entitled to inspect and copy all education records relating to them, subject to certain exceptions. They may also challenge the content of such records at a hearing. Personal records or information regarding K-State students will not be released without their written consent, except in specified cases. See page 339 for a detailed statement.

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 & 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	4
Royal Purple journalism	1	4
Men's Athletics	1	4
Women's Athletics	1	4

Credits may be counted as electives in the student's curriculum. A student may use no more than eight 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 might exceed the maximum usable for graduation.

Military Training

Reserve Officer Training is offered by both the Air Force and the US Army. Students who qualify can enter the program during their freshman year and compete for a commission as a 2nd Lieutenant upon graduation. 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.

Scholarships are awarded on a competitive basis to entering freshmen, sophomores, and juniors. Military scholarships pay all university fees, lab fees, books, plus a monthly subsistence of $100.

Academic credit may be applied to requirements for a degree. The Colleges of Engineering and Architecture and Design recognize only 4 hours toward their degree requirements. The other colleges recognize the full 16 hours of the 4-year ROTC program.

Course Description Key

Course Number	Description
000-099	Courses carrying no credit.
100-299	Lower division undergraduate designed as freshman-sophomore courses.
300-499	Upper division undergraduate designed as junior-senior courses.
500-699	Upper division undergraduate primarily for juniors and seniors, but also eligible for graduate credit. Courses numbered 500 may be taken for graduate credit only in a minor field. Courses numbered 600 may be taken as part of a graduate student's major field.
700-799	Graduate and upper division, primarily for graduate level.
800-899	Graduate level for primarily masters' courses and professional courses beyond undergraduate level.
900-999	Graduate level primarily for doctoral courses.

Within the parentheses ( ) after each course title are shown the semester hours of the course, followed by the terms it is offered. Each unit usually represents one 50-minute period of lecture or recitation, or two or three 50-minute periods of laboratory each week of the semester. I, II, S indicate when the course is offered. I means fall semester; II, spring semester; and S, summer session. I, II, means both semesters. Pr. indicates "prerequisite." Conc. means concurrent.

Classification Of Students

A student who is a high school graduate, or who offers 15 acceptable units of high school work, 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 to only the College of Architecture and Design.

Common Degree Requirements

The common requirements for all curricula leading to an undergraduate degree are: English Composition, 6 credits; Oral Communications, 2 credits; Concepts of Physical Education, 1 credit.

Undergraduate Degree Requirements

To be graduated, 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 160 hours, according to the curriculum taken. To be awarded an undergraduate degree a student must have earned a grade-point average of a least 2.0 (C) on all Kansas State University courses taken for resident graded credit and applied toward the degree. Professional curriculums may impose additional degree requirements.

Up to one-half of the credit required for an undergraduate degree may be completed at an accredited two-year college.

All students 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 this institution. 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 Kansas State University; the student must submit satisfactory plans and reasons for completing the degree requirements at another institution as for medicine, dentistry, law, medical technology and physical therapy prior to earning a degree here.

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

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-sixth's policy.

Candidates for spring graduation are urged to attend commencement. Summer and fall graduates are invited to participate in the following spring commencement exercises. Also, prospective graduates may participate in the spring exercises prior to graduation. All participants must wear the appropriate cap and gown.

Most students complete degree requirements in the normal four or five academic years allotted for that purpose. However, some may take additional time because of a significant change of educational objective. Others may interrupt their 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 the 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 degrees must be satisfied. Students should confer with their academic dean's office to determine an appropriate program of study.

KSU Honor And Conduct Code

The members of the University community at K-State expect its students to make mature responses to problem situations and to conduct themselves in exemplary fashion as they interact with all members of the learning community. Individual responsibility and self-government are the major principles in maintaining honorable relations among K-State students and other members of the local community. For a detailed statement, see page 339.

Degrees

Mathematics Entry Requirements

The degrees shown below are conferred on completion of the prescribed curricula: The letter which precedes each curriculum Indicates the prerequisite high school math course listed below. It is recommended that entering freshmen complete the prerequisite 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 (or approved substitute for Home Economics).
(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.

College of Agriculture, page 48.

(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 (BS in Bakery Science and Management)
(E) Crop Protection
(E) Dairy Production
(E) Feed Science and Management (BS In Feed Science and Management)
(E) Food Science and Industry (BS in Food Science and Industry)
(E) Horticulture
(E) Horticultural Therapy
(E) Milling Science and Management (BS In Milling Science and Management)
(E) Natural Resources Management
(E) Poultry Science
(E) Pre-Forestry (non-degree)
(E) Pre-Veterinary Medicine (non-degree)
(E) Retail Floriculture (certificate)

College of Architecture and Design, page 84

(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, page 94

(Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music, and Bachelor of Science)

(B) Anthropology, BA or BS
(A) Art, BA or BFA
(E) Biochemistry, BA or BS
(E) Biology, BA or BS
  General Biology
  Microbiology
  Fisheries & Wildlife Biology
(E) Chemistry, BA or BS
  General Chemistry
  Chemical Science
(B) Computer Science, BA or BS
(E) Cytotechnology, BA or BS
(A) Dance, BA or BS
(B) Economics, BA or BS
(A) English, BA
General or Area Studies
  (A) Humanities, BA
  (D) Life Science, BA or BS
  (E) Physical Science, BA or BS
  (A) Social Science, BA or BS
(B) Geography, BA or BS
(E) Geology, BA or BS
(A) Health, BA or BS
(B) Journalism & Mass Communications, BA or BS
  Journalism & Mass Communications (Print)
  Radio-Television
(F) Mathematics, BA or BS
(E) Medical Technology, BS
(A) Modern Languages, BA
(A) Music
  Music, BA
  Applied Music, BM
  Music Education, BS In Music Education
(A) Philosophy, BA or BS
(A) Physical Education, BA or BS
(E) Physics, BA or BS

(B) Polltical Science, BA or BS
(E) Pre-Dentistry, BA or BS
(E) Pre-Law, BA or BS
(E) Pre-Medicine, BA or BS
(E) Pre-Nursing (non-degree)
(E) Pre-Optometry (non-degree)
(E) Pre-Pharmacy (non-degree)
(E) Pre-Physical Therapy (non-degree)
(E) Pre-Veterinary Medicine (non-degree)
(E) Psychology, BA or BS
(A) Recreation, BA or BS
(E) Social Work, BA or BS
(E) Sociology, BA or BS
General Sociology
Correctional Administration
(A) Speech, BA or BS
General Speech
Speech Pathology-Audiology
(A) Statistics, BA or BS

College of Business Administration, page 200

(Bachelor of Science in Business Administration)

(E) Accounting
(E) Finance
(E) General Business Administration
(E) Labor Relations
(E) Management
(E) Marketing
(E) Office Administration

College of Education, page 208

(A) Elementary Education (BS in Elementary Education)
Secondary Education (Bachelor of Science)
(A) Education—Adult
(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—Geography
(A) Education—History
(A) Education—Journalism
(F) Education—Mathematics
(A) Education—Modern Language
(E) Education—Physical Science
(E) Education—Physics
(B) Education—Political Science
(B) Education—Psychology
(B) Education—Sociology
(A) Education—Speech

College of Engineering, page 234

(F) Agricultural Engineering (BS in Agricultural Engineering)
(F) Architectural Engineering (BS in Architectural Engineering)



(F) Chemical Engineering (BS in Chemical Engineering)
(F) Civil Engineering (BS in Civil Engineering)
(F) Construction Science (BS in Construction Science)
(F) Electrical Engineering (BS in Electrical Engineering)
(E) Engineering Technology (BS in Engineering Technology)
(F) Industrial Engineering (BS in Industrial Engineering)
(F) Mechanical Engineering (BS in Mechanical Engineering)
(F) Nuclear Engineering (BS in Nuclear Engineering)

College of Home Economics, page 270

(Bachelor of Science in Home Economics)
(C or D) Consumer Affairs
(C or D) Dietetics and Institutional Management
(C or D) Early Childhood Education
(C or D) Family Life and Human Development
(C or D) Fashion Design
(C or D) Fashion Marketing
(C or D) Food Science and Industry (BS in Food Science and Industry)
(C or D) Foods and Nutrition in Business—Community Service
(C or D) Foods and Nutrition Science
(C or D) Home Economics Education
(C or D) Home Economics Extension
(C or D) Home Economics/Liberal Arts
(C or D) Home Economics and Mass Communications (BS in Home Economics and Mass Communications)
(C or D) Housing and Equipment
(C or D) Interior Design
(C or D) Restaurant Management (BS in Restaurant Management)
(C or D) Textile Science

College of Veterinary Medicine, page 294

Veterinary Medicine (Doctor of Veterinary Medicine)
(See Colleges of Agriculture and Arts and Sciences for BS degrees in connection with College of Veterinary Medicine.)

Fees

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 prior to the beginning of any semester or summer session.

Payment of Fees. Students must pay the total amount of their semester or summer session fees on the day they register, either by cash or by check. Late registration fees are assessed those who register or pay their fees after the regular registration period. Students receiving scholarships or grants not processed through the Kansas State University Student Financial Assistance office must present evidence of the award to the Student Financial Assistance office prior to registration or they will be required to pay the full amount of their fees from personal resources.

Withholding Student Records. When necessary, the University withholds students' academic records for non-payment of fees, loans and other appropriate charges.

Incidental Fee. The incidental fee is the student's contribution toward the costs of instruction and covers approximately 20 to 25 percent of the instructional costs.

Student Health Fee. For a description of the services provided by the fee, see page 30.

Student Union Annex I Fee. This fee is used to retire the K-State Union Annex I building revenue bonds.

Student Union Annex II Fee. This fee is used to retire the K-State Union Annex II building revenue bonds.

Stadium Bonds Fee. This fee is used to retire the KSU Stadium revenue bonds.

Student Recreational Building Fee. This fee is used to retire the student recreational building revenue bonds.

Student Activities Fee. The student activities fee is used for numerous student functions which include a broad range of student interests and activities. Those enrolling in six credit hours or less do not pay a full activities fee and thus are not entitled to the yearbook and certain student events without additional payment nor are they entitled to student ticket rates for athletic events.

Fees for Fall and Spring Semesters

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 prior to the beginning of any semester.

For seven or more semester credit hours:

Fees	Resident	Non-resident
Incidental Fee:		
All except Veterinary Medicine students	$255.00	$750.00
Veterinary Medicine students	305.00	825.00
Special Fees:		
Student Health	40.00[1,2]	40.00[1,2]
Student Union Annex I	2.25	2.25
Student Union Annex II	10.25	10.25
Stadium Bonds	4.25	4.25
Student Recreational Building Bonds	12.00	12.00

Student Activities (including Union operations)	24.25[2]	24.25[2]
Totals—All except Veterinary Medicine students	$348.00	$843.00
Totals—Veterinary Medicine students	$398.00	$918.00

For six or fewer semester credit hours:

Fees		Resident	Non-resident
Incidental Fee:			
All except Veterinary Medicine students	per cr. hr.	$ 17.00	$ 50.00
Veterinary Medicine students	per cr. hr.	20.00	55.00
Special Fees:			
Student Health	total fee	40.00[1] [3]	40.00[1] [3]
Student Union Annex I	total fee	1.50	1.50
Student Union Annex II	total fee	6.50	6.50
Stadium Bonds	total fee	.50	.50
Student Recreational Building Bonds	total fee	6.00	6.00
Student Activities (including Union operations)	total fee	11.50[4]	11.50[4]

For employees enrolled in Graduate School:

Incidental Fee	per cr. hr.	$ 17.00
Special Fees:		
A. If enrolled in seven or more credit hours:		
Student Health	total fee	40.00[1]
Student Union Annex I	total fee	2.25
Student Union Annex II	total fee	10.25
Stadium Bonds	total fee	4.25
Student Recreational Building Bonds	total fee	12.00
Student Activities (including Union operations)	total fee	24.25
B. If enrolled in six or fewer semester credit hours:		
Student Health	total fee	40.00[1] [3]
Student Union Annex I	total fee	1.50
Student Union Annex II	total fee	6.50
Stadium Bonds	total fee	.50
Student Recreational Building Bonds	total fee	6.00
Student Activities (including Union operations)	total fee	11.50[4]

[1] Students enrolled in a spring semester, who pay the Student Health fee, and are pre-enrolled for the following fall semester may elect to use the "no charge services" of the Student Health Center between the end of the spring semester and the end of the summer session by paying a $10 fee prior to the end of the spring semester.

[2] Students paying the full incidental fee who will be at off-campus locations during an entire semester and will reside outside of a 30-mile radius of Manhattan during that semester may elect to be exempted from the Student Health fee and the Student Activities fee.

[3] Full-time employees, and spouses of full-time employees, enrolled in six or fewer credit hours, may elect to be exempted from the Student Health fee and thereby not be eligible for Student Health Center services.

[4] Not a full activity fee and does not entitle student to the yearbook and certain student events without additional payment, nor to student athletic ticket rates.

Fees For Summer Sessions

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 prior to the beginning of any summer session.

Fees	Resident	Non-resident
Incidental Fee (per credit hour)	$ 17.00	$ 50.00
Special Fees (per credit hour)	7.00[1]	7.00[1]

[1]The Summer Session special fees are assessed only on the first six credit hours for each summer session, and are not applicable to students enrolled in formally organized classes actually conducted at off-campus locations. Includes Student Health, Union Building Bonds, Stadium Bonds, Student Recreational Building Bonds, Students Activities and Parking fees.

Persons Eligible For Resident Fees

1. Residents. Usually includes adults and minors of parents who have been residents of Kansas for twelve months or more prior to registering for any semester or session. The official residency determination for fee purposes is made by the Dean of Admissions and Records.

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

For fall semesters—all of Sept., Oct. & Nov.

For spring semesters—all of Feb., Mar. & Apr.

For summer sessions—part of June and all of July, or all of the preceding Feb., Mar. & Apr.

3. Federal Employees. Federal employees given adjunct appointments at Kansas State University.

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

5. Dependents. Dependent spouses and children of staff members, federal employees and military personnel defined above.

6. Employees. Same as staff members defined above, plus federal employees defined above and ROTC staff members of Kansas State University. Dependents are not entitled to the fees for employees.

Other Fees And Refund Policy

Private Music Lessons and Practice Facilities. University students enrolled in a bachelor's or master's degree program with a major in music, music education or applied music are exempt from fees for private music lessons and music practice facilities. Fees for all others, payable in advance, are as follows (Subject to the availability of staff, facilities and the following refund policy).

	University Students	Non-University Students
Two 30-minute lessons a week, per semester	$50	$87
One 30-minute lesson a week, per semester	30	45
Two 30-minute lessons a week, summer session	25	43
One 30-minute lesson a week, summer session	15	22
Single lessons, each	5	5
Practice piano, 1 hour daily, per semester	6	6
Practice piano, 2 hours daily, summer session	6	6
Practice organ:		
Two-manual, 1 hour daily, per semester	12	12
Two-manual, 2 hours daily, summer session	12	12
Three-manual, 1 hour daily per semester	25	25
Three-manual, 2 hours daily, summer session	25	25

Field Geology Fee. The fee for the summer geology field camp is $100, which is the additional amount required from all students enrolled in this course for their transportation and lodging for the field camp.

Refund policy. (Applies to semester, summer session, field geology, music lessons and music practice facility fees only.) Refunds will not be made until sufficient time has elapsed to insure that fee payment checks have been honored—usually 15 days after students register. If an enrollee withdraws during a regular semester or eight-week summer session, the following schedule of refunds shall apply. However, the student activities fees is not refunded if the student does not return the student fee receipt card.

	Regular Semester	8-week Summer Session
Through the first Friday of classes	100%	100%
Through the second Friday of classes	90	75
Through the third Friday of classes	80	50
Through the fourth Friday of classes	70	no refund
Through the fifth Friday of classes	60	no refund
Through the sixth Friday of classes	50	no refund
After the sixth Friday of classes	no refund	no refund

Late Registration or Fee Payment: (Not subject to refund)

After regular registration through 20th day of classes	$10.00
After 20th day of classes	$25.00

Exceptions: The $10 fee begins: after last regular evening registration if registering for evening classes only; after 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 $10 fee begins 15 calendar days and the $25 fee begins 30 calendar days after notification of amount due. For summer sessions the fee increases from $10 to $25 after the 10th day of classes. Late fees do not apply to corrections of fee assessments.

Student Identification Card. A charge for the original card is included in the Student Activities fees. A $2 fee is assessed for each card replaced.

Transcript Fee. A fee of $1 is charged for each transcript of academic record requested by a student after six transcripts have been furnished at no charge.

Auditing Fee. A person who is neither an enrollee paying full incidental fee, nor a staff member, is assessed $1 per semester credit hour audited. However, persons 60 or older may audit courses on a space available basis without charge. Laboratory or Continuing Education courses may not be audited. This fee is not subject to refund.

Laboratory Fees and Course Charges or Deposits. No laboratory fee, course charge, or deposit may be assessed against or collected from persons enrolled in any regular semester or summer session at Kansas State University, except for chemistry laboratory courses, geology field camps, and for excessive usage, breakage or losses due to personal negligence on the part of the student. Charges then can only be for the actual fair value of supplies used or lost and are subject to the approval of the appropriate dean or the president.

Loans, Misuse Fees and Other Charges. Kansas State University is authorized to approve loans to students as appropriate and to collect such loans and related interest and charges; and further, to collect library misuse fees, parking misuse fees, rental and use fees for recreational equipment furnished by the Department of Recreational Services, and charges for ROTC property and student health services when such fees and charges are authorized. All such loans, fees and charges are deemed to be part of this fee schedule.

Correspondence Study. Information about correspondence study courses, including the fees charged, is available from the Extramural Independent Study Center, University of Kansas, Lawrence, Kansas 66044.

Charges to Government or Private Agencies. The fees collected under arrangements with governmental or other agencies follow in general the fees outlined above, and in all cases the charges are equal to or greater than the fees stated herein.

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 "Special Fees" for students enrolled in seven or more semester credit hours and will be entitled to use the Student Health Service, K-State Union and Student Recreational Building, and to purchase tickets for athletic and cultural events at student prices.

Other Expenses. In addition to the applicable fees, students are required to purchase textbooks, drawing instruments, slide rules, gym suits 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 a Kansas resident	$ 348*
Books and supplies, about	100
Room and board in University housing	653
Clothing, laundry, postage, travel, extra meals & social activities (varies with the individual)	424
Total estimated expenses (half of academic year)	$1,525

* Non-resident fees are $843 per semester and Veterinary Medicine students pay an additional $50 (if a resident) or $75 (if a non-resident).

Student Employees

To be employed as a graduate assistant, graduate research assistant, or graduate teaching assistant, a graduate student must be enrolled in at least six resident semester credit hours at KSU during the fall and spring semesters, and at least three resident semester credit hours at KSU during the regular summer session or been enrolled in at least six 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 seven resident semester credit hours (six for graduate students) at KSU during a fall or spring semester; and at least four resident semester credit hours (three for graduate students) at KSU during a summer session, or been enrolled in at least seven resident semester credit hours (six for graduate students) at KSU during the preceding spring semester.

Housing

Thomas J. Frith, Director
Jean M. Riggs, Associate Director

Kansas State University considers the housing of students as part of the total educational plan. All students are invited to live in the University residence halls. All single freshmen are required to live in a residence hall or Greek chapter house if space is available. General exceptions to this policy are veterans of the armed forces or students living at home.

Other exceptions to this policy must be cleared through the Director of Housing.

Available Housing Facilities. Kansas State University provides residence hall living for 4,500 students, cooperative housing for approximately 45 men and 64 women and 576 apartments for student families. Sororities provide 600 places for women, and fraternities have accommodations for 1,400 men. Others find privately owned rooms and apartments from University-approved listings.

Self-Government in Residence Halls. Learning to manage your own affairs is certainly a part of university life. This takes maturity and self-discipline. K-State students start as freshmen with self-government within the framework of general University regulations. In all University residences, elected hall councils assume responsibility for many activities. Married students on campus use the mayor-council form of government to regulate their community life.

Residence Halls. Each residence hall is staffed with a professionally trained director and staff. The total residence hall personnel program is coordinated by the Director of Housing.

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

Each hall has lounges and recreation rooms for relaxation and social activities—with TV sets, stereo equipment, ping-pong tables and the like providing for any occasion from a game-watching party to a Christmas ball.

With the exception of the Sunday evening meal, three meals are served daily. Most meals are served cafeteria style, but special dinners and faculty buffets add to the variety of the food service program.



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

When the hall application and fee are received by the Department of Housing, a nine-month housing contract is forwarded to the student.

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

Payment Schedule. (A) Full payment of $640 or (B) Payment schedule (if not paid in full) below:

Fall Semester		**Spring Semester**	
Payment with contract	$163	January 10	$163
September 10	163	February 10	163
October 10	163	March 10	163
November 10	163	April 10	163

Rates are subject to change.

Applications and detailed information are available through the Department of Housing.

University Cooperative Housing. There are many students who would profit greatly from a university education, but do not feel they can afford four college years. Kansas State University offers, in addition to scholarships, two cooperative living houses designed to lessen the financial burden of attending the University.

These are cooperative units, in the sense that the students do their own housekeeping—cooking, cleaning, and dishwashing. In this way living costs, a big item in the budget, are lowered considerably.

Smith Cooperative House houses 45 men who spend about six hours a week at their house duties.

Smurthwaite House for women provides cooperative living for 64 freshmen and upperclass women at low cost. This is a new and contemporary house.

At Smurthwaite, house duties are rotated so each student has a chance to learn all aspects of house management. The duties take about an hour daily. Everyone lends a hand on special occasions.

Applications for these houses are considered on the basis of academic ability and financial need. Write to the Department of Housing for applications and information.

Family Housing. Student families have not been overlooked in the housing program at Kansas State University. One- and two-bedroom apartments at Jardine Terrace are available both furnished and unfurnished. These low-cost apartments are close to the campus. Each group of buildings has a central laundry.

The furnished apartment rates are $100 a month for a one-bedroom apartment and $120 a month for a

two-bedroom apartment. A limited number of unfurnished apartments is available; one-bedroom $95 per month, two-bedroom $110. For the apartments the rental includes utilities such as gas and water. Rates are subject to change.

Applications are available at the Department of Housing, Pittman Building.

Graduate Student Housing on Campus. Single graduate students are welcome to live in the residence halls. When possible, these students are assigned to a graduate area of a hall.

Single graduate students qualify for the Evans Apartments. There are 20 apartments in this building which rent for $100 a month for a one-bedroom and $120 a month for a two-bedroom. These are furnished and water and heat are furnished. Applications are available from the Department of Housing.

Off-Campus Housing. The Department of Housing, Pittman Building, has a card file of rooms and apartments which are available in Manhattan. It is necessary that students who wish to live off campus visit Manhattan and personally select their own rooms and apartments.

Listings change too rapidly to be of use by mail. Rent ranges from $35 to $55 a month for one person to a room and $25 to $35 a month per person when two or more reside in a room. Meals at the K-State Union Cafeteria and local cafes will cost $70-90 a month. Apartments rent from $75-275 a month, depending upon the size of the family and the facilities required.

All Manhattan householders who rent to students are expected to follow the University policy of making accommodations available to all students regardless of race, color, or national origin.

Sororities. Booklets describing sororities and setting forth the provisions regulating selection of new members are provided to all prospective freshmen and interested upperclass women by Panhellenic Council. These may be obtained by writing to the Faculty Adviser to Sororities.

House bills in sororities will average approximately $700 a semester. This includes room, board, and sorority dues. Freshman members, however, live in residence halls and pay sorority dues of approximately $40 a month.

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

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 an invitation to membership before classes start and if they cancel their residence hall contracts. Costs will average $725 a semester. For more information, write to the Faculty Adviser to Fraternities.

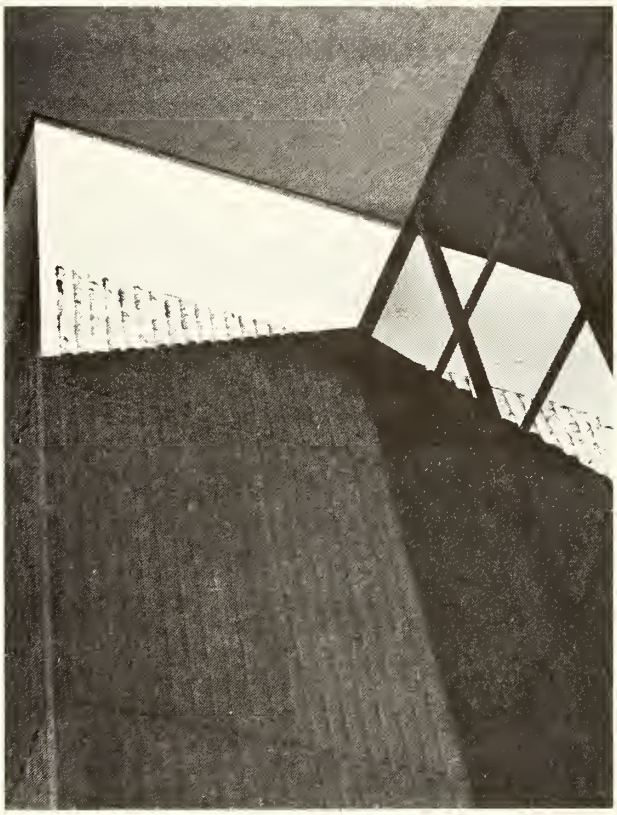
The following national fraternities are established at K-State: Acacia, Alpha Gamma Rho, Alpha Kappa Lambda, Alpha Phi Alpha, Alpha Tau Omega, Beta Sigma Psi, Beta Theta Pi, Delta Chi, Delta Sigma Phi, Delta Tau Delta, Delta Upsilon, FarmHouse, Kappa Alpha Psi, Kappa Sigma, Lambda Chi Alpha, Omega Psi Phi, 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.

Clovia. Clovia 4-H House provides accommodations for 62 upperclass women. Although 4-H members are given preference, any coed is eligible for membership. Since Clovia 4-H House is a cooperative unit with the members supplying the labor for cooking and cleaning, monthly housebills are approximately $110 including social fees. The women spend about six hours a week at their house duties. Applications are made through the County Extension Offices, the State 4-H Department at Kansas State University, or the Clovia Membership Chairman, 1200 Pioneer Lane, Manhattan, Kansas 66502.

Research Resources

Particle Accelerators

Kansas State University, in cooperation with the Energy Research and Development Agency, operates a major facility for the acceleration of atomic particles, particularly heavy ions. There are several accelerators associated with this facility including a 12 MeV tandem Van de Graaff accelerator with an "on-line" PDP-15 computer and a 3 MeV, high-current Van de Graaff accelerator. In addition, there are two low-energy, high-current accelerators. The accelerators provide the University and the State of Kansas with particle accelerator capabilities over an unusually large range of projectiles and energies up to 55 MeV.



These accelerators are housed in Cardwell Hall. A professional staff and graduate students maintain an active research program which addresses problems in atomic physics related to the development of fusion energy as well as problems in heavy-ion nuclear physics and solid-state physics. For further information concerning this facility, write to the Director, Nuclear Science Laboratories, Physics Department.

Nuclear Reactor

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, Nuclear Engineering Department.

Konza Prairie

Konza Prairie Research Natural Area is an 8,136 acre area within a few miles of the University which is 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.

A floating laboratory on the 15,000-acre Tuttle Creek Reservoir is used for limnological and fisheries studies. Also associated with the reservoir is the Tuttle Creek Fisheries Research Laboratory. This laboratory has 28 quarter-acre plastic-lined ponds for research on fish nutrition, growth, and population dynamics.

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.

Other Research Facilities

A wide 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:

Editorial offices of major journals in history, English, economics, horticulture, education, and modern languages
Scanning electron microscope
Transmission electron microscope
Nuclear magnetic resonance spectrometers
Recording Raman spectrometer
X-ray diffractometers
Mass spectrometric laboratory
Population and demographic laboratory
Statistical laboratory
Wind and soil erosion laboratory
Controlled environment test facility
Audio visual materials center
Experimental animal facilities
Data banks of the Consortium for Political Research
Arp electronic music synthesizer
Laboratory for physiology of exercise
Glassblowing and instrument shops
High power, pulsed nitrogen laser
Continuously tunable lasers
Fourier transform spectroscopic laboratory

University Computing Facilities

Tom L. Gallagher, Director

Computing services for instruction and instructional support activities in the fields of research, administration, and public service are provided by the University Computing Facilities; also, these services are available to other public and private educational institutions. Statewide computing efforts are fostered among the Board of Regents' many educational institutions. The University Computing Facilities is organized into two separate centers—the academic Computing Center and the administraive Data Processing Center.

Computing Center. This center supports the instructional and research activities of the faculty, staff, and students. The professional staff provides assistance in the use of hardware and software. Manuals, texts, publications, the *Newsletter*, and other materials are available in the User information Center located in Cardwell Hall. Additionally, manual racks are maintained in several locations on campus.

The computer for this center is an IBM System 370 Model 158 with one megabyte of main core and 500 million bytes of associated direct-access storage. Supporting peripheral equipment include tape drives, card readers, a card punch, line printers, low-speed interactive terminals, remote-job-entry stations, an incremental plotter, and card processing equipment. Three Remote Computing Laboratories are located on the campus and provide direct access to users for fast turnaround of user-written batch jobs in WATBOL, WATFIV, PLC, and ASSIST.

Programming languages on the system include FORTRAN, COBOL, PL/1, APL, SPITBOL, and Assembler. Generalized applications packages for statistical and simulation tasks are available using SPSS, SAS, BMD, GPSS and CSMP. The Conversational Monitor System, CMS, is the interactive system that supports communications terminals using APL, SCRIPT, VS Assembler, and WATFIV. Non-credit courses are taught periodically to assist users to more fully utilize the capabilities of the computer and its program environment.

Data Processing Center. This center supports the administrative community of the University. These services consist of application systems, programming, operational and data entry functions provided by the staff of the center on a closed-shop basis. Some of the computerized processing services performed directly for the student community are registration, personnel changes, payrolls, billings for student health, and the concessions of the Student Union.

The computer for this center is an IBM System 370 Model 145 with 512K bytes of main core. Supporting equipment to this machine includes disk and tape drives, card reader, card punch, line printer, and card processing equipment. COBOL is the programming language.

Library System

G. Jay Rausch, Dean

The Francis David Farrell Library, named after Kansas State University's eighth president, is the central unit of the University library system. It is supplemented by six branch libraries in other buildings: Architecture, Chemistry, Physics, Veterinary Medicine, and two dormitory libraries, Derby and Kramer.

The libraries contain 820,000 cataloged volumes. Growth is at 30 to 40 thousand volumes a year. In addition to the cataloged volumes, the libraries contain a full government depository collection, including the publications of the Atomic Energy Commission and the Energy Research and Development Administration, a teaching materials collection, an extensive microform collection and 50,000 records, tapes and slides. The library receives a current list of 8,500 journals.

Farrell Library now provides more than 200,000 square feet of space. Seating is available for 3,000 students. One hundred locked study carrels are provided for doctoral candidates. Five hundred additional individual study spaces are available to graduate and undergraduate students.

Except for the rare book room, reserve collection, and the record collection, the library is entirely open shelf. Collections are organized into three subject areas: Social Science-Humanities, Education and Science. These departments are supplemented by a general reference and bibliography department, a documents department, a special collections department, and a minorities center.



With its land-grant background, the library has always had a superior science collection. During recent years, to meet its multi-purpose university responsibility, significant additions have been made to the collections in the humanities and the social sciences. Much of this material has been in microform as evidenced by the need for a microform reading room in each of the subject areas.

To take advantage of the library resources in the region, the library operates a courier service which travels twice a week east to Kansas City and twice a week south to Wichita. Much use is made of the collections in the Linda Hall Library and the University of Kansas Library. The six state-supported institutions of higher education belong to a teletype network. They also permit direct borrowing by students and faculty. The library is a member of the Kansas Information Circuit—a teletype network of the larger public and system libraries of the state. Direct teletype connection is also available to many other libraries.

Services and Facilities

Postal Service

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 University Postal Center in Anderson 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.

An inter-office campus mail delivery service is operated by the Physical Plant Department. Since this service is operated with state funds, it may be used only for official University business.

Inquiries regarding specific use of the campus mail service should be addressed to the Vice President for University Facilities, while inquiries regarding U.S. Postal Service should be addressed to the University Comptroller.

The Speech and Hearing Clinic

The clinical facilities and services of the Speech and Hearing Clinic, Room 107, Leasure Hall, are available for consultation, examination and therapy.

Services are extended to University students who have impairments of speech, hearing or language functions. These clinical services also are available to children and adults of the surrounding communities. A purpose of the clinic is to provide educational and clinical experiences to students who are preparing for careers in speech pathology and audiology. Students may call for information or they may be referred by instructors or other interested persons.

Kansas State University Publications

University Publications

General Catalog Bulletin
Student Catalog Bulletin
(Information for prospective students)
Summer School Bulletin
Late Afternoon, Evening, Weekend and Off-Campus Courses Bulletin (spring and fall)
Family Report
Financial Report
Extension Bulletins
Agricultural Experiment Station Bulletins
Engineering Experiment Station Bulletins

Student Publications

The Kansas State Collegian—daily newspaper
The Royal Purple—yearbook
The University Directory

Other Publications

The Agriculturist—published quarterly
The Kansas State Engineer—published six times a year
The K-Stater—published eight times a year by the Alumni Association

The Regents' Press of Kansas

Kansas State University participates with the other universities under the State Board of Regents in sponsoring the Regents' Press of Kansas, an organization dedicated to the advancement of scholarship through publication of scholarly books, as well as material on Kansas and mid-America. It is the first university press in the United States to be operated on a statewide level under the specific sponsorship of all the state's universities.

Administrative control of the Press rests with a board of trustees composed of the academic vice-presidents of the sponsoring institutions. The Press's chief executive officer is the director, who is assisted in editorial decisions by a 12-member editorial committee, of which he is chairman. Two faculty members from each of the universities, or their alternates, serve on the committee, with each delegation headed by a vice chairman. The Press offices are at 366 Watson Library, The University of Kansas, Lawrence, KS 66044.

The Summer School

E. Norman Harold, Director

The Summer School is an integral part of the educational program of Kansas State University. It is designed to meet the needs of the following groups:

1. Undergraduate 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.
2. Graduate students, for whom the Summer School offers an opportunity to make more rapid progress towards a degree, and teachers who are unable to attend the University during the two semesters.
3. Special interest, non-degree groups, including public school, business and industrial personnel.

High school graduates expecting to enter the University for the first time are urged to attend the Summer School. These students find it valuable in establishing study habits, becoming acquainted with the campus and faculty, and adjusting to university life.

The Summer School has available all the facilities and services of the University which are available in the regular semesters, including housing, food service, counseling and testing services, Student Health Center, and K-State Union recreational programs. A large number of the classrooms and library study rooms are air conditioned.

A special recreation program is planned for each summer session. It includes dancing, parties, movies, lectures, concerts, plays, tennis, boating, water skiing, swimming, fishing, bowling and other sports.

The Summer School consists of an eight-week session in which a student may earn as many as nine semester hours of credit. Full-credit two, three and four-week concentrated courses are offered to accommodate students who cannot attend the eight-week session. The length of these special sessions varies from a week to four weeks.

The *Summer School Bulletin* gives complete and detailed information about the Summer School. It is available in February each year. A copy may be obtained free of charge by requesting it from the Dean of Admissions and Records.

Through the Regents' Continuing Education Network, some K-State summer courses are offered at more than 20 Kansas locations. The network allows individuals to enroll in courses offered by the six state colleges and universities as well as KSU.

The teaching staff of the Summer School is formed from the regular instructional staff of the University, supplemented by visiting professors and lecturers.

The courses offered in the summer are chosen from among those offered in regular semesters with the addition of conferences and workshops planned to meet special needs. The particular courses chosen for Summer School are determined by each college on the basis of expected student demand.

Student Personnel Services

Chester E. Peters, Vice President for Student Affairs

Kansas State University has developed a complete program of student personnel services because education involves many experiences outside the classroom.

This philosophy stresses the importance of providing students with a variety of opportunities and services aimed at improving and supporting their academic activities; intellectual development; vocational interests, aptitudes, and skills; emotional balance; social relationships; moral and religious values; physical health; and aesthetic appreciations.

Student needs for adequate medical care, housing, food, financial assistance, employment, counseling, recreation, and spiritual inspiration, have been anticipated in this program.

The Vice President for Student Affairs is responsible for maintaining a close relationship with the faculty and administrative staffs in helping to interpret student needs.

The vice president has general responsibility for the administration and coordination of the following divisions comprising the Student Personnel Program: Student Financial Assistance; Career Planning and Placement Center; Center for Student Development; Housing; Recreational Services; K-State Union; and Lafene Student Health Center and University Hospital.

The Vice Presidents for Academic and Student Affairs have a special assistant, an Associate Dean for Minority Affairs, who is responsible for counseling and programs with minority groups.

Center for Student Development

Earl Nolting, Director

Staff members of the Center for Student Development work in a variety of ways with individual students and student groups, and serve as liaison to all elements of the University community.

Units within the center are organized to identify and meet the needs of K-State students. Responsibilities include maintaining a working relationship with residence halls, fraternities and sororities, student government, student organizations, campus religious groups, and the University judicial system.

Also, major direction for many programs comes from the Center for Student Development including: summer enrollment and orientation, special assistance to minority and foreign students, a women's resource center, student leadership and staff training, workshops for housemothers, group life seminars, discussion groups in study skills instruction, vocational and occupational information, or interpersonal relations.

Another major emphasis is on individual development. Counseling assistance is available, and students are encouraged to examine their potentials and to increase their ability to become self-directed individuals.

The programs are evaluated by research staff members who also study characteristics of K-State students and changes which occur. Several staff members hold part-time academic appointments in addition to their positions in the center.

New Student Programs. The new student orientation program assists approximately 3,000 entering students during summer pre-enrollment. The summer program usually is the students' initial encounter with the University and, in addition to providing needed information, often results in the beginning of meaningful friendships. A concurrent program assists parents of new students in becoming acquainted with the University, its programs and facilities, University staff, and student leaders. Orientation also is offered for new students in January and August.

The group life seminar course gives new students a chance to meet with small groups of other entering students and upperclass student leaders. The weekly meetings provide opportunities for personal development and for learning more about the University. New students receive one hour of academic credit for the course.

Religious life at the University finds expression in many church-sponsored student organizations and in more than 30 church congregations in Manhattan. Student Services staff assists in coordinating campus religious activities. On campus there are two memorial chapels—Danforth and All Faiths—which are available for student religious services and private meditation. Use of these chapels is scheduled through the Center for Student Development.

Minority and Cultural Programs. The primary thrust of this area is to assist low-income, physically handicapped, and minority students to maximize their educational development at Kansas State University. There are several components within this area.

The Educational Opportunities Program. This program assists low-income, physically handicapped, and minority students in setting and attaining realistic educational goals, provides students with information about post-secondary

educational opportunities at Kansas State University, assists students in securing the necessary financial resources to continue their education, and coordinates educational supportive services to students on campus identified with special needs.

The Cultural Enrichment Program. Emphasis is placed on encouraging minority students to seek leadership roles on campus, advising minority students' organizations including the Black Student Union, MECHA (a Chicano student organization), and the American Indian Student Body, and assisting student organizations in sponsoring programs and lectures which bring minority leaders to KSU and heighten multi-racial awareness within the community.

Upward Bound Program. This federally funded program's primary mission is to provide services for low-income and culturally different students which will enhance their chances of academic success. The Upward Bound Program is designed to generate functional skills and motivation in young people with inadequate secondary school preparation and low-income backgrounds. It focuses on students completing the 10th, 11th and 12th grades of Manhattan, Junction City, St. George, and Westmoreland high school communities.

The Special Services Program. This federally funded program is designed to assist students admitted and enrolled at K-State. Services include counseling (personal, vocational and financial), academic advising, tutorial assistance and a variety of referral services. Student eligibility is determined by income criteria established by federal guidelines.

Counseling Center. The Counseling Center offers the assistance of professional counselors and counseling psychologists to KSU students and their spouses (and others on a limited basis) throughout the academic year. The intent of this counseling assistance is to promote wise choices regarding the "problems of living" that are a natural and potentially positive consequence of growth and development.

Attending a large university with its challenges, excitement and frustrations frequently brings about substantial changes in the students' attitudes, style of life, and goals for the future. The center provides persons an opportunity to regroup their coping strengths, check out ideas, and obtain support while dealing with the problems facing them. The more persons become aware of the patterns they have built up through previous development—abilities and talents, social assets and liabilities, interpersonal style, emotional strengths and weaknesses, wishes, values and aspirations—the more they are able to influence their subsequent development by the choices they make. The main purposes of counseling are to promote this kind of awareness and to encourage this kind of choice.

Clients are encouraged to keep the responsibility for their own lives firmly in their own hands. Decisions must be **their** decisions, and they must know on what basis they make them in order to develop increased capacity to meet and deal with life's challenges and opportunities.

Individuals and couples seeking assistance may choose to meet with a counselor to explore educational-vocational possibilities and/or discuss personal-social concerns, or they may choose to meet with other individuals and couples in small counseling groups (C-groups) led by center staff for mutual help and support.

In addition, a wide range of Counseling Center programs is offered to foster personal growth and development, including the following: assertive training, biofeedback and relaxation training, career life planning (earns academic credit, ED 405-511), life planning workshops, pre-marriage and marriage workshops, peer sex education, pregnancy counseling, psychological testing, study skills (earns academic credit, ED 415-051), leadership training, and value clarification. Audiotape, videotape and other forms of instrumental feedback frequently are used in these programs.

Center staff members also consult with individuals and groups (students, staff and faculty) about classroom interaction, group dynamics, group decision-making and goal-setting, interpersonal communication, leadership skills, organization development and program planning. These consultations often include participation in the implementation of these programs. Interested persons are invited to solicit the help of center staff in developing additional programs and/or workshops on various aspects of university experiences.

At most hours of the day, a counselor is available to see immediately anyone coming to the Counseling Center. High school seniors may use the service before entering college by writing for an appointment. The Counseling Center is in the West Lobby of Holtz Hall.

International Center. The Kansas State University International Center, situated at the corner of Mid-campus Drive and Claflin Road on the campus, makes available to each K-State student, faculty, and staff person the opportunity for a true international sharing and learning experience. The center allows campus, community, and state involvement in international programs. The large number of international students attending KSU represents a rich educational and cultural resource. These resources provide a nucleus about which existing international programs can be revitalized and new ideas initiated. Center programs can assist the campus and community to attain goals and aspirations which transcend race and nation. The International Center includes a lounge, multi-purpose room, kitchen, dining

room, and office areas. The Foreign Student Office also is in the International Center.

Foreign Student Office. The Foreign Student Office serves more than 650 foreign students on the Kansas State University campus. It also serves over 50 who have graduated and are in a Practical Training status but for whom the office provides administrative services. It is called upon to advise students about renewals of stay, passports, work permits, finances, travel, housing, university services, etc. In addition, the office acts as a resource for the campus, community and state in questions concerning international programs and services. It also serves in developing programs for foreign students. The Foreign Student Office works with all facets of the University to implement and support the goals of the students and the University in international education.

The Foreign Student Adviser advises and provides referral services for all international students on campus. This person helps promote mutual concern between foreign and American students, as well as concern among the foreign students, the faculty and the community.

Program Development and Research. The Program Development and Research staff assists with the planning, implementation and evaluation of programs within the Center for Student Development and works closely with faculty, advisers, students, and other student personnel staff in the development of student assistance programs. Programs and workshops will, upon request, be designed to assist faculty groups, student personnel staff, student organizations, and volunteers in improving their programming effectiveness.

The staff conducts and publishes research on the characteristics, attitudes, and needs of the K-State student body for purposes of assisting academic departments, student personnel staff, and students in their program development efforts. This research is published in the report series entitled *Studies in Student Personnel.*

CLEP Testing Center. The Center for Student Development is the service agency on campus for the College Level Examination Program (CLEP). CLEP examinations may be taken on the third Saturday of every month by anyone properly registered with the College Entrance Examination Board. In addition, special testing dates are scheduled at the start of each academic semester for students desiring to test out of courses in which they are currently enrolled. The Center staff will also conduct utility studies and provide consultation to academic departments interested in implementing CLEP examination procedures for their courses. Students desiring information about the CLEP program at K-State and those wishing to register for these examinations are invited to stop by the Center for Student Development in Holtz Hall.

Student Activities. This office, which is in the K-State Union, provides coordination of the University judicial system, advises the University Learning Network (ULN) and the Student Governing Association (SGA), assists individuals and groups who wish to organize and register their activities on the K-State campus, and develops student-staff informational publications. University Learning Network (ULN) is K-State's educational information and campus assistance center. Questions regarding academics, campus activities, student or faculty locations and campus/community services may be directed to 532-6442.

Entrance and Professional Examinations. The Center for Student Development also is responsible for administering the following entrance and professional examinations:

Allied Health Professions Admissions Test
American College Test (Residual)
American College Test-Proficiency Examination Program
Dental Admissions Testing Program
Graduate Management Admission Test
Graduate Record Examination
Law School Admission Test
Miller Analogies Test
Scholastic Aptitude Test
Test of English as a Foreign Language
Veterinary Aptitude Test

These examinations are often required by colleges and universities for entrance into undergraduate study or graduate and/or professional programs. Anyone desiring to register for these examinations or desiring information about them should contact the Center for Student Development.

Women's Programming and Resource Center. The K-State Women's Programming and Resource Center is concerned primarily with raising the level of awareness of students regarding the changing roles of men and women and the broad implications of these changes. It serves both as a center of information and as a referral agency regarding opportunities and programs about and for women students. Special features include assertive training, rape prevention, and a variety of discussion groups. Special emphasis is given to the needs of re-entry students and of single parents. Both men and women are invited to use the center.

Student Financial Assistance

Michael A. Novak, Director

Loan Programs. Many Kansas State University students who qualify on the basis of financial need are assisted with student loans through the National Direct Student Loan Program. The NDSL is made at no interest while the student is enrolled and at 3% beginning 9 months after termination of studies.

While no absolute deadline has been established for submitting loan applications, it is advisable to plan early and apply for loan assistance prior to April 1 of each academic year.

Many students borrow up to $2,500 a year without a need verification if family adjusted gross income is less than $25,000 through the Guaranteed Student Loan Program. Applications may be obtained from participating lenders, banks, savings and loans, etc., or from any student financial aid office.

Qualified students also may borrow through Emergency, University, Alumni and Endowment funds to meet specific needs. Interested students should contact Student Financial Assistance, Fairchild Hall.

Scholarship Programs. More than 1,000 Kansas State University undergraduate students receive scholarship assistance each year based on their academic record and financial need. The priority date for submitting the financial aid application is February 15 prior to the fall semester in which the student intends to enroll.

Part-Time Work. Kansas State University employs more than 3,500 students each year and they earn in excess of $2.1 million. Approximately 700 students, qualified on the basis of need, are employed on the Work-Study Program while the remainder are on regular campus payroll.

All of the above programs, except regular campus jobs, require a student to submit a KSU Financial Aid Application and a Family Financial Statement. Students living in Kansas may obtain the KSU Financial Aid Application and the Family Financial Statement (FFS) from any high school counselor. Those applicants living out of state may obtain the FFS from a high school counselor or college financial aid office and write to Student Financial Assistance for the KSU application.



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

Those 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 Viet Nam.

Information may be obtained from your nearest Veterans Administration Office or Student Financial Assistance office 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 Division of the State Board for Vocational Education, Topeka, Kansas.

Career Planning And Placement Center

J. Bruce Laughlin, Director

One vital criterion in the selection of a college or university should be the career development services it provides. On this basis Kansas State University compares most favorably with other institutions.

The Career Planning and Placement Center, in Anderson Hall, assists prospective freshmen, undergraduates, graduating seniors, graduate students, and alumni with career planning and employment.

As its name implies, 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. Service provided includes employment vacancy referrals, data sheet and resume preparation assistance, interview workshops, career counseling, self-instructive video taping, government/industrial employer interface workshops, etc.

Although not all curricula are heavily involved, the center successfully attracts hundreds of business and industrial recruiters to the campus each year for employment interviews. Students in curricula not regularly sought on campus have access to career counseling and guidance to develop job search strategies effective off-campus. Guidance is provided for obtaining summer as well as full-time employment.

The Career Library reflects current employment trends and opportunities in business, industry, agriculture, education, and government. Although much employer literature is transitory, a comprehensive collection of materials is maintained to assist students in assessing occupations in the broad sense as well as individual employment settings.

In the field of education, current information is filed on positions open and qualifications required in elementary, secondary, and college-level work, including administration. Information on employment opportunities is available, and qualified staff members are eager to help students and alumni with employment considerations.

Lafene Student Health Center

Robert E. Sinclair, M.D., Director

The Lafene Student Health Center and University Hospital is a Joint Commission accredited hospital serving the health needs of K-State students. It is conveniently located in the center of the campus just west of the library. It is made up of a large outpatient clinic and a 26-bed hospital unit where students may be hospitalized when necessary. It is a modern facility, caring for all needs of the students, with the exception of major surgery, and contains a pharmacy, physical therapy department, medical laboratory, and X-ray department.

The Mental Health Section on the lower level of the center provides diagnostic, consultative treatment and referral services to students experiencing emotional or psychological problems. As the center is also responsible for the environment of the campus, the Environmental Health and Safety Section also is housed in this unit, along with a health educator.

The center is staffed by full-time physicians with adequate medical supporting personnel. When necessary, the student is referred to specialists for treatment. If, for example, surgery is necessary, the patient has a choice of several able Manhattan surgeons. Treatment is at the student's expense and can be performed at one of the two local hospitals.

Medication, laboratory tests, and X-rays are available at the center at reduced rates. Many services are offered at no cost. Hospitalization in the University Hospital is provided at special rates for the first 21 days—thereafter, the charge is reasonable and comparable to that of other Kansas hospitals.

After regular clinic hours a student who is ill or injured may receive medical care through the emergency clinic of the Lafene Health Center. Home calls are not made.

It is strongly recommended that all students at Kansas State University carry medical insurance, either through the parent's plan at home or through the health insurance program available to students at special rates. This plan supplements the coverage provided free or at reduced costs by the Lafene Student Health Center on campus and covers payable claims for medical expenses if the student requires care away from the campus. The student may purchase this insurance at the time of class enrollment.

Kansas State University requires a complete medical history 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 highly suggested, and a copy of this examination would assist the staff in evaluating any illness while at K-State. If a student has a continuing medical problem, a summary from the attending physician would be helpful for future treatment. Students receiving allergy injections must furnish instructions from their allergist before injections can be administered at the Health Center.

Since certain diseases are more prevalent in some areas of the world, all new international students are required to have a physician complete the Kansas State University Medical Certificate prior to admission.

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.

K-State Union

Walter D. Smith, Director

The K-State Union is the center for social, recreational and cultural activities on the KSU campus.

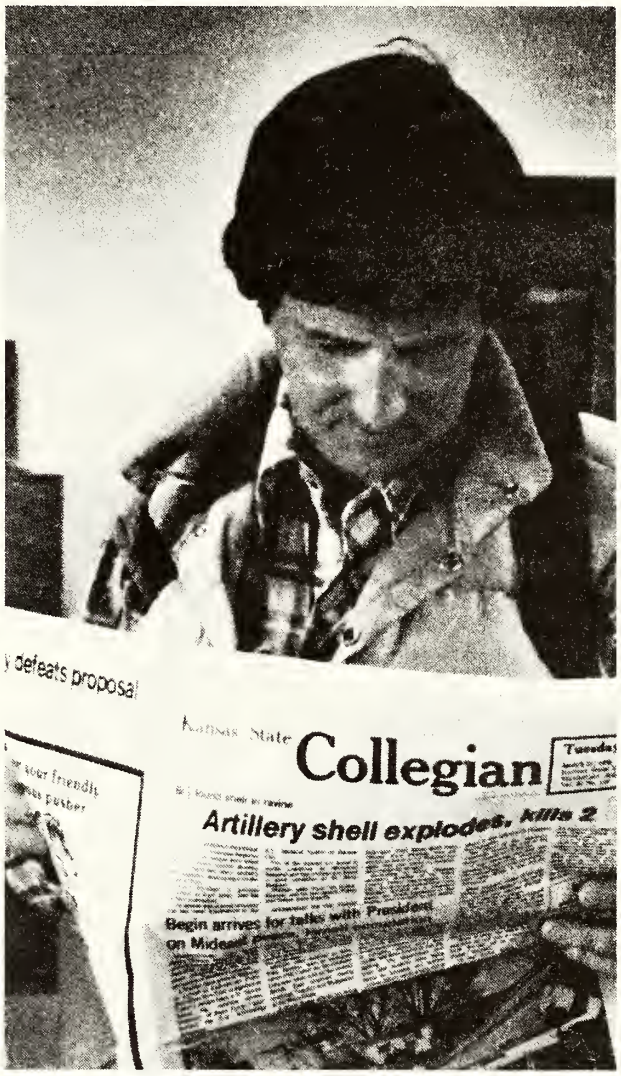
The 5.5-million-dollar building features an open space concept of architecture highlighted by a three-story courtyard in the center of the building.

Built entirely by student fees, the Union features a cafeteria-snack bar, 576-seat auditorium, 280-seat Little Theatre, full-service bookstore, recreational facilities (bowling, billiards, table tennis, etc.), art gallery, central information desk, lounges, banquet rooms, copy center and Student Governing Association offices.

In operation since 1956, the Union operates on a self-supporting basis with income from eight operating units and student fees.

The K-State Union director and staff operate the building under the guidelines and policies established by the Union Governing Board. The board consists of students, faculty and alumni and acts as a board of directors for the operation of the Union.

The Union Program Council, a 250-member student volunteer organization, with offices in the Activities Center, provides over 400 programs annually for the cultural, educational and personal growth of students. All students are welcome to participate in the Union Governing Board or the Union Program Council.



Recreational Services

Raydon H. Robel, Director

It is the desire of the Recreational Services Department to provide every student in the University the opportunity to participate in some recreation activity. No activity is compulsory, but an attempt has been made to make activities appealing and desirable.

Recreation is a renewal of the mental, emotional, and physical state of mind and body for the continuance of personal and professional well-being. As

such, it has a vital function in any university community. The philosophy of the Recreational Services Department is that students should have freedom of choice, equality of opportunity, and responsibility for sharing in planning, supervising, administering, and participating in the recreational programs and services.

The department offers three areas for physical recreation programs. These three areas are emphasized in the following preferential order: (1) free time recreation, (2) competitive intramurals, and (3) sports clubs and special programs.

The department attempts to sponsor as much free play and recreational use of facilities for the students, faculty, staff, and their families as is possible. Free time recreation is unstructured; set up for a time to recreate at your own convenience, and is away from schedules and academic pressures. This area includes free time use of all facilities and a variety of fitness and special programs.

Intramural sports are the scheduled competitive activities of the University's recreation program. Teams are organized from fraternities, sororities, residence hall floors, independent groups, co-rec, and faculty groups. Thousands participate each year in the varied intramural activities. They engage in both team and individual sports without regard to their level of skill. The department offers 30 different activities on the competitive level.

Sports clubs exist primarily as an outlet for special interests rather than for outside competition. The purpose in establishing a sports club program is (1) to offer sports activity to interested students which goes beyond intramural and classroom competition, (2) to help students learn and develop special skills in sports areas, and (3) to encourage the growth and expansion of local competition. Clubs operating under the department are fencing, jujitsu, canoe-kayak, and power volleyball.

The L.P. Washburn Recreational area north of the campus includes lighted tennis and handball courts, outdoor basketball, multi-purpose fields for games and sports activities of all kinds, a golf driving area, and an archery range. Also in this area is an equipment check-out center for various types of sports equipment, plus outdoor recreation equipment for canoeing and camping on a rental basis. The regular sports equipment is loaned to all University-connected people.

The indoor facilities at KSU feature a natatorium with two 25-yard swimming pools, one diving pool with two 1-meter and two 3-meter boards, and a sun deck area. The remainder of the indoor facilities are in Ahearn Gymnasium and Fieldhouse. Facilities include basketball, volleyball, and badminton courts, a weight lifting room, men's and women's locker rooms, and a tartan jogging track. A new indoor recreation complex will be operational by late 1979 or early 1980 and will house more gym space, handball/racquetball courts, weight and exercise space, a dance and combatives multipurpose room and locker rooms.

For students interested in a unique learning experience the department provides student employment as lifeguards, sports officials, supervisors, and office assistants.

Operations Of Motor Vehicles

Possession of cars by students is discouraged. All motor vehicles operated on the campus or in Riley County must be registered with the University Traffic and Security Office. Students living in residence halls and freshmen cannot secure parking permits for the campus proper. However, upperclass residence hall students can purchase a parking permit for their residence hall lot only as space is available. Driving and parking of motor vehicles are governed by regulations established by a student-faculty Traffic and Parking Council, by authority of K.S.A.—74-3211.

Student Organizations

There is something for everyone. More than 200 clubs, interest groups and professional societies offer students a nearly unlimited scope of extracurricular activities.

There are recreation clubs for those interested in skiing, sailing, horseshoes, judo, sports cars, flying and fencing. Dance clubs, literary clubs and many music ensembles and choirs offer cultural expression and appreciation.

A great number of professional societies exist to promote interest in subjects from nuclear engineering to photojournalism to geography.

There are also environmental interest groups, political clubs and service oganizations which encourage social participation and responsibility.

Many of the college departments have organizations which permit students to take an active role in curriculum selection and course evaluation.

All these groups have an important place in student life, providing opportunities for recreation and a chance to make new friends, besides broadening knowledge and raising awareness of issues.

Graduate School

R.F. Kruh, Dean
John P. Noonan, Associate Dean
John P. Murry, Associate Dean for Sponsored Programs

Graduate Study At Kansas State University: Its Beginning And Development

Although the first graduate student enrolled in 1868, the year 1886 is the significant date for graduate study at Kansas State University. In that year a standing committee on graduate work was created, and it was then established that a Master of Science degree would be granted to candidates who demonstrated a proficiency in one of the industrial arts or sciences and who presented a thesis reporting original research. Industrial arts included agriculture, horticulture, engineering, architecture and design, and domestic economy. The sciences were botany, chemistry, zoology, entomology, and physics.

Requirements for the master's degree evolved through the years and by 1912 definite procedures had been worked out whereby all applications for graduate study were passed upon by the Council of Deans, with student programs determined by the dean of the division (now college) in which the student did his major work. In October, 1919, a Graduate Council of seven members was created to administer graduate courses. It represented the divisions of Agriculture, Engineering, General Science (now Arts and Sciences), Home Economics, and Veterinary Medicine. The council members and its chair were appointed by the president. At that time members of the Graduate Faculty were selected by department heads and approved by the council. In November, 1931, a separate Division of Graduate Study was established under a dean, and in 1931 the Board of Regents authorized doctoral programs in chemistry, milling industry, bacteriology, and entomology. The Graduate School acquired its present name in 1942, and its policy-forming group is an elected Graduate Council representative of each college or school and the major areas of graduate study.

The Graduate School Today

The Graduate School's continued development is demonstrated by increased enrollments, improved quality of its programs, and the diversity of the offerings. More and more students are being attracted to graduate study because they have developed interests in advanced scholarly work and because their career opportunities are improved as a result of advanced training. The quality of the programs has been recognized by awards for increased research and training support from outside agencies and for the acquisition of sophisticated research apparatus and new library facilities. Faculty members from various departments have pooled their talents and resources in cooperative research and training activities with the result that students' programs of study may readily cross traditional departmental lines.

Graduate study is based on the proposition that students work individually or in small groups with a major professor. Most advanced graduate courses, are, therefore, taught in small seminars which provide for the exchange of ideas among the students and instructor. The ultimate objective is to create the desire and capacity for independent study and research.

In keeping with today's trends in higher education, the Graduate School is concerned with a program designed to aid the student to achieve the maximum possible liberality in education while pursuing the specialized professional courses of study. Graduate students are encouraged, therefore, to aspire to a well-rounded self-development, and with it an outlook of a more adequate world view, through participation in those chosen university courses and activities which may enable them individually to gain such ends.

Wide support of research programs is provided through the Agricultural Experiment Station, the

Engineering Experiment Station, and the Bureau of General Research. Each of the experiment stations offers backing for relevant research in many quarters of the campus beyond those traditionally identified with such stations, and the Bureau of General Research specifically serves units not supported by the experiment stations.

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 department, which will supply application blanks and supplementary information about its program. Applicants should see that each undergraduate or graduate institution previously attended sends two copies of 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 from within the United States are required to fill out a Medical History form for Lafene Student Health Center. International students must submit a health certificate as part of their application and report to the Student Health Center during enrollment for a physical examination.

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:

(1) A bachelor's degree from an institution accredited by one of the regional accrediting associations,

(2) Adequate undergraduate preparation in the proposed major field or equivalent evidence of an appropriate background for undertaking an advanced degree program, and

(3) An undergraduate average of B or better in the junior and senior years.

Probationary admission to the Graduate School will be considered if all of the foregoing requirements are not met, 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 deficiences or other conditions to be met to attain full standing. Full standing is attained automatically upon completion of at least nine 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 two copies 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 nine semester hours earned as a special student may be transferred into a regular degree program.

International Students. The Graduate School requires each foreign applicant, whose national 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 assuring that the student's progress toward a degree is not jeopardized by language difficulties. 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 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 their enrollment. Students who fail to meet this requirement must enroll in and satisfactorily complete English 075, Speech 101, or both, as appropriate.

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 nine 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 nine hours during a summer session. Full-time staff members of the University may not be assigned to more than six hours in one semester, nor more than three 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 assistant-

ships.) 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 adviser 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 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 students (or their 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 do not live in the vicinity of Manhattan may make arrangements to enroll by mail but should request permission for doing so by writing the Graduate Office prior to the enrollment period.

Fees. See the General Information section in the front of this catalog for detailed information about fees.

Graduate Study by Seniors. Seniors at Kansas State University who are within two semesters of receiving the bachelor's degree may enroll for one or more courses for graduate credit, **provided they have at least a B average on their prior work at the junior-senior level.** The total enrollment in such cases may not exceed 17 hours per semester or nine hours per summer session, and not more than 12 semester hours of graduate work may be accumulated in this way.

Degrees

Requirements

Student Responsibility. Graduate students are held responsible for knowing the academic policies and degree requirements set forth in this catalog. 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 regarding the University's policies as to the standard of work required for continued enrollment in the Graduate School. The Graduate 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 dissertation research, the major adviser 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 review.

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 make a grade of B or better in three-fourths of the credit hours attempted at KSU (excluding research, problems, internships, practicums or other individualized study). 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 completion of six hours of graduate work.

Academic Probation and Dismissal. Admission to and continuation in the Graduate School depends upon a high level of achievement. Accordingly, 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 and, in either case, 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 six or more semester hours of work with grades of less than "B," exclusive of problems courses, practicums, internships, research, or other individualized study, 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 for reinstatement to the same curriculum or for admission to a different curriculum.

Non-Graded 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. 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 three hours of credit-no credit or pass-fail courses may appear on the program of study for the master's degree nor more than six for the Ph.D.

Validation of Credits. All credits, whether from Kansas State University or transferred and 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 area, or by successfully completing a validation examination. However, credits in a doctoral program which have been earned as part of a master's degree remain valid and require no further validation. The department may choose which of the above methods is to be used for validation, and 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.

Master's Degree. Candidates for the master's degree are normally required to spend one academic year in residence. Subject to the approval of the major department, the candidate may choose one of the following options: (1) a minimum of 30 semester hours of graduate credit including a master's thesis of six to eight semester hours, (2) a minimum of 30 semester hours of graduate credit including a written report of two 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, production of creative work, and so forth, as determined by the student's supervisory committee. Candidates for the Master of Regional and Community Planning degree must satisfactorily complete a minimum of 48 hours, and those working for the Masters of Fine Arts must complete 60 hours.

The student's program of study is prepared with the assistance of an advisory committee consisting of the major adviser 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 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 Dean.

Three copies of theses and reports are required. All such reports and theses 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 reports or theses a money order made out to an approved bindery. The University Library will forward manuscripts to the bindery for the candidate. 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 $20.

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.

Doctor of Philosophy. At least three years of two semesters each of graduate study beyond the bachelor's degree, equivalent to about 90 semester hours, and a dissertation are required of candidates for the degree of Doctor of Philosophy (Ph.D.). Students admitted to doctoral programs must complete a year of full-time study in residence at Kansas State University as a degree requirement. Furthermore, a minimum registration of 30 hours in research is required for the doctoral degree, not including work done toward a master's degree. Each candidate also must have completed at least 24 hours of regular degree credit in course work at Kansas State University. 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, home economics, 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.

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 adviser, subject to approval by the department head, and are appointed by the Dean of the Graduate School. The committee consists of at least four members of the Graduate Faculty, one of whom is the major adviser who serves as chair, and at least one member shall be from a department different from that of the major adviser. 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. Before

*As used in the Graduate School the term, department, refers to interdepartmental graduate groups as well as to departmental faculties in the usual sense.

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 Office. 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, contributing 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 must be submitted to the Dean of the Graduate School as a last requirement to be met for award of the degree.

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, the student must deposit a money order made out to an approved bindery with the dissertation. The University Library will forward manuscripts to the bindery for the candidate. Each dissertation is microfilmed and an abstract is published in Dissertation Abstracts. The current fee is $25.

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 Office in the case of any student seeking to copyright a dissertation.

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.

Graduate Teaching Assistantships and Graduate Research Assistantships. Award of assistantships is based on the student's ability and promise and is usually made for either nine or twelve months. The usual appointment is for half-time, but appointments for lesser fractions also may be made. Students are eligible for resident fees during each term in which they hold an appointment for at least two-fifths time. In addition, students who have been on appointments for at least two-fifths time during the academic year are eligible for resident fees during the following summer term even though they do not hold assistantships. The maximum enrollment for assistants is ten hours for half-time and twelve hours for two-fifths time appointments; the minimum is six hours in the regular terms and three in the summer. The corresponding maxima for a summer term are five and six hours respectively. Students desiring such appointments may obtain application blanks from the head of the department concerned.

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.

MASUA Traveling Scholar Program

As a member of the Mid-America State Universities Association, Kansas State University participates in the MASUA Traveling Scholar Program. Universities cooperating include Iowa State University, University of Kansas, Kansas State University, University of Missouri at Columbia, Kansas City, Rolla, and St. Louis, University of Nebraska, University of Oklahoma and Oklahoma State University.

The MASUA Traveling Scholar Program is designed to provide breadth and depth in the opportunities for graduate study offered at MASUA Universities by permitting graduate students to study at another MASUA University where they may utilize unique facilities or specializations.

Graduate students at MASUA Universities are eligible to participate in this program for a minimum of one term of enrollment. The student's major adviser initiates the proposal for the student's participation by contacting the professor at another MASUA University where the student wishes to study. The Graduate Dean at each MASUA University involved must concur in proposed participation. During the time of participation, the student will register for the appropriate number of hours and pay fees at the home University. Funds have been available on a competitive basis to pay a small dislocation allowance to MASUA scholars. Additional information concerning the MASUA Traveling Scholar Program is available in the Graduate Office.

Organizations, Housing, Loans

For information about student organizations, graduate student housing and loans, see the General Information section of this catalog.

Offerings Of The Graduate School

Major Fields for Master of Science. Major work leading to the degree Master of Science is offered in the following fields:

Agricultural Economics
Agricultural Education
Agricultural Engineering
Agricultural Mechanization
Agronomy
Anatomy and Physiology
Animal Sciences
Biochemistry
Biology
Chemical Engineering
Chemistry
Civil Engineering
Clothing, Textiles and Interior Design
Computer Science
Crop Protection
Education
Electrical Engineering
Entomology
Family and Child Development
Family Economics
Food Science
Foods and Nutrition
General Home Economics
Genetics
Geology
Grain Science
Health, Physical Education
Home Economics Education
Horticulture
Industrial Engineering
Infectious Diseases
Institutional Management
Journalism and Mass Communications
Mathematics
Mechanical Engineering
Microbiology
Nuclear Engineering
Parasitology
Pathology
Physics
Plant Pathology
Psychology
Recreation
Statistics
Surgery and Medicine

Major Fields for Master of Arts. Major work leading to the degree Master of Arts is offered in the following fields:

Art
Economics
English
Geography
History
Mathematics
Modern Languages
Political Science
Radio and Television
Sociology
Speech

Master of Accountancy. Major work leading to the degree Master of Accountancy is offered in the College of Business Administration.

Major Fields for Master of Architecture. Major work leading to the degree Master of Architecture is offered in the following fields: Architecture, Interior Architecture, Environmental Technology, and Urban Design.

Master of Business Administration. Major work leading to the degree Master of Business Administration is offered in the College of Business Administration.

Master of Landscape Architecture. Major work leading to the degree Master of Landscape Architecture is offered in the College of Architecture and Design.

Master of Music. Major work leading to the degree Master of Music is offered in the Department of Music.

Master of Regional and Community Planning. Major work leading to the degree Master of Regional and Community Planning is offered on an interdepartmental basis, with the program centering administratively in the Department of Regional and Community Planning.

Master of Fine Arts. Major work leading to the Master of Fine Arts Degree is offered in the Department of Art.

Major Fields for Doctor of Philosophy. Major work leading to the degree Doctor of Philosophy is offered in the following fields:

Agronomy
Animal Sciences
Biochemistry
Engineering
English
Entomology
Mathematics
Microbiology
Parasitology
Biology
Chemistry
Computer Science
Economics (Agricultural)
Economics (Arts and Sciences)
Education
Food Science
Foods and Nutrition
Genetics
Grain Science
History
Home Economics
Horticulture
Pathology
Physics
Physiology
Plant Pathology
Psychology
Sociology
Statistics

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 Sciences

Don L. Good, Chairman

The interdepartmental graduate program in Animal Sciences is offered by faculty members in the Departments of Animal Science and Industry, Dairy and Poultry Science, Biochemistry, Statistics, Biology, Physiology, and Grain Science and Industry.

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 Meat and 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, 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.

Animal Breeding

R. R. Schalles, Chairman

Professors Craig and Wheat; Associate Professors Dayton, Kemp, Schalles, and W. Smith.

The major in Animal Breeding is designed to equip 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

Professors Adams, Bartley, Brent, Deyoe, Harbers, Koch, Parrish, Richardson, Sanford, Smith, and Ward; Associate Professors Allee, Ames, Bolsen, Frey, Hines, Morrill, and Riley.

Course work for candidates specializing in Animal Nutrition will include graduate level work in areas such as nutrition, biochemistry, physiology, histology, microbiology, statistics, computer science, grain science and others necessary to meet the specific needs of individual candidates.

Animal Production and Management

A.W. Adams, Chairman

Professors Adams, Bartley, Craig, Farmer, Good, Norton, E. Smith, Ward, and Wheat; Associate Professors Allee, Allen, Ames, Bolsen, Dikeman, Hines, Kiracofe, Morrill, Riley, Schalles, and W. Smith.

Graduate programs in this area are planned to 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; college algebra plus one additional course 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, and animal physiology.

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 and industry, agricultural engineering, agronomy, animal behavior, biology, business administration, communications, mathematics, computer science, dairy and poultry sciences, economics, education, food sciences and grain science.

Animal Products

Donald Kropf, Chairman

Professors Bassette and Kropf; Associate Professors Allen, Cunningham, and Dikeman; Assistant Professors Hunt and Kastner.

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. Kiracole, Chairman

Professors Farmer and Gier; Associate Professors Able, Ames, and Kiracofe.

Degrees are designed to equip students for vocations in general animal reproduction. Study will be in the areas of reproductive endocrinology, developmental reproductive anatomy, environmental effects on reproduction, milk secretion, and applied use of reproductive control techniques.

Degree candidates will acquire training in physiology, biochemistry, and statistics. Additional course work may be required to meet specific needs of individual candidates.

Biochemistry

W.E. Klopfenstein, Chairman

Professors Bode, Burkhard, Clarenburg, Clegg, Cox, Hedgcoth, H.L. Mitchell, Nordin, Parrish, Ruliffson, and Tsen; Associate Professors Center, B. Cunningham, Klopfenstein, Marchin, Mueller, Roufa and Seib; Assistant Professors Davis, K. Kramer, Reeck, Roche.

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 the departments of Biochemistry, Physiological Sciences, Grain Science and Industry, and the Division of Biology.

Entering graduate students must meet the entrance requirements of the Graduate School and must have completed one year of analytical, organic and physical chemistry; differential and integral calculus; and a course in biology, including a laboratory. Students entering this program with considerable training in biology must meet these requirements, but they may satisfy the physical chemistry requirement by including the year of physical chemistry as a part of their graduate program. A year of French, German or Russian is a requirement for admission into the Graduate Biochemistry Program.

Crop Protection

O.J. Dickerson, Chairman

Professors Dickerson,* and Greig; Associate Professors Miles,* Schwenk*, Stuteville, Thompson, and Wilde; Assistant Professors Ehler,* Long, Moshier* and Poston,*.

Graduate work leading to a Master of Science degree in Crop Protection is offered through an in-

*Crop Protection Curriculum Steering Committee

terdepartmental program. It is administered by the Crop Protection Steering Committee composed of faculty from the departments of Agronomy, Entomology, Horticulture and Forestry, and Plant Pathology.

The curriculum is designed to train students to become professional crop protection specialists. Graduates may find employment with federal and state agencies, with industries serving agriculture, as private practitioners, and with individuals and organizations engaged in crop production. A program of study will be developed to meet the needs of each student by a supervisory committee drawn from the Crop Protection Graduate Faculty. Course work is concentrated in the areas of crop protection, entomology, plant pathology, nematology, and weed science. Students will generally complete the non-thesis option of the Master of Science degree. Those interested in a research-oriented degree should investigate programs offered in the various cooperating departments.

In addition to meeting the general entrance requirements set by the Graduate School, students must have or complete introductory course work in biology, crops, entomology, plant pathology, and weed management.

Food Science

R. Bassette, Chairman

Professors Bassette, Bowers, Caul,* Chung*, Clegg, Deyoe, Erickson,* Fan, Farrell, Finkelstein, B. Fryer, Greig, Harrison,* Hoover, Hoseney,* Kropf,* Kyle, H.L. Mitchell, P. Nordin, Parrish, Pfost, Ponte, Ruliffson, Schruben, Seib, Spears, Tsen, and Ward; Associate Professors Allen, Brent, B. Cunningham, F. Cunningham,* Klopfenstein, Paulsen, and Robinson,*; Assistant Professors Bates, Deikeman, Hunt, Iandolo, Kastner, Marshall, Mugler, Roach, Setser and Varriano-Marston.

Graduate work leading to the degrees Master of Science and Doctor of Philosophy in Food Science is offered in the departments of Animal Sciences and Industry, Biochemistry, Chemical Engineering, Dairy and Poultry Science, Dietetics, Restaurant and Institutional Management, Grain Science and Industry, Foods and Nutrition, Horticulture, and Forestry, 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 so as to give adequate coverage in several food areas, with primary emphasis in one or more areas. The student will be expected to include in the program of study general biochemistry, statistics, microbiology of foods or dairy bacteriology, food chemistry, and a course in food processing if these courses are not included in previous preparation. Course requirements will be evaluated by the student's advisory committee, but must include one credit of Food Science Colloquium for the M.S. degree and two credits of Food Science Colloquium for the Ph.D. degree. At least one member of the Food Science Coordinating Committee should serve on the student's advisory committee.

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.

There is no foreign language requirement.

Following are selected courses in Food Science:

Animal Sciences and Industry
Institutional Meats
Meat Technology
Meat Packing Plant Operation
Advanced Meat Science
Analytical Techniques in Animal Science and Industry
Fundamentals of Milk Processing
Poultry Products Technology
Chemistry of Foods
Principles of Dairy Foods Processing
Food Plant Management
Lipids in Food Systems
Practical Quality Control of Dairy and Food Products
Dairy Bacteriolgy

Biochemistry
Proteins
Chemistry of Carbohydrates
Lipids
Advanced Biochemistry Laboratory
Enzyme Chemistry
Enzyme Laboratory
Physical Biochemistry

Chemical Engineering
Transport Phenomena
Chemical Reaction Engineering
Biochemical Engineering
Biotransport Phenomena
Selected Topics in Biochemical Engineering

Dietetics, Restaurant and Institutional Management
Food Production Management
Quantity Food Purchasing and Control
Food Service Equipment and Layout

Division of Biology
Microbiology of Foods

Foods and Nutrition
Food Science
Principles of Nutrition
Advances in Foods
Food Research Techniques
World Nutrition
Fundamentals of Food Flavor Analysis
Bionutrition
Advanced Nutrition
Fundamentals of Meat Processing and Preparation
Proteins in Food Systems
Food Systems
Advanced Foods
Research Methods in Foods and Nutrition
Food Science Colloquium
Principles of Food Product Development and Control
Nutrition and Aging
Nutrition Needs Throughout the Life Cycle
Diet Therapy
Advances in Nutrition
Child Nutrition

Grain Science and Industry
Milling Technology I
Flour and Dough Testing
Baking Science I
Baking Science II
Bakery Technology
Cereal Science
Food and Feed Plant Sanitation
Milling Technology II
Fundamentals of Grain Storage
Principles of Food Analysis
Qualities of Feed and Food Ingredients
Enzyme Applications
Fundamentals of Processing Grains into Foods
Advanced Cereal Chemistry

Horticulture and Forestry
Handling and Processing Fruits and Vegetables
Vegetable Crop Physiology

Genetics

E.G. Heyne, Chairman

Professors Bode, Craig,* Heyne,* Nassar,* Pittenger,* Sorenson, Wassom, and Wheat;* Associate Professors Barnett, Burlingham, Clayberg,* Liang, T.R. Manney, Nickell, Roufa, Smith, Schalles, and Tomb; Assistant Professors L. Bates, Campbell, R. Denell, Rodkey, and Williams.

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 which sets the academic requirements for degrees and assigns one or more of its members to the supervisory committee of each student. Graduate students are associated with the department to which their major professor belongs, but the graduate degrees are awarded in genetics.

In addition to the general entrance requirement set up by the Graduate School, students in genetics should have an introductory course in genetics and six hours of biological sciences. Students who do not meet these requirements can make up these deficiencies either by examination by the appropriate departments 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. These requirements, outlined below, are a minimum to allow specialization in different areas of genetics such as plant and animal breeding, plant and animal genetics, population and statistical genetics; and microbial, cellular and molecular genetics. The minimum academic requirements are as follows:

An introductory course in biochemistry or statistics for the M.S. degree.

An introductory course in both biochemistry and statistics for the Ph.D. degree.

Three of the following courses will be required for the M.S. degree and five will be required for the Ph.D. degree.

Agronomy
Plant Breeding
Plant Genetics

Animal Sciences and Industry
Population Genetics
Quantitative Genetics

Biology
Genetic Analysis of Eukaryotic Organisms
Molecular and Cellular Biology
Molecular Genetics
Regulation of Gene Expression

Grain Science and Industry

Horticulture and Forestry
Plant Breeding
Plant Genetics

Statistics
Statistical Population and Quantitative Genetics I
Statistical Population and Quantitative Genetics II

Descriptions of these courses can be found in the respective departmental sections of this catalog.

The participating departments are Animal Sciences and Industry, Agronomy, Horticulture and Forestry, Dairy and Poultry Science, Grain Science and Industry, 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.

*Members of the Genetics Coordinating Committee.

Home Economics

Elnora T. Huyck, Chairman

Professors Bollman, Hoeflin, Huyck, Kennedy, Morse, Spears, and Stith; Associate Professors Bergen, Davis, Jurich and Poresky; Assistant Professors Annis, Bagarozzi, Cabradillo, Roach, Russell, Scheidt, Vaden and Villasi.

The Ph.D. program in Home Economics is interdepartmental and is designed for advanced study of the family—its development, its effective utilization of resources, and its critical role as determinant of future generations. Subject matter is integrated from those home economics fields based largely on social sciences along with related fields outside the college. A home economics emphasis is developed for each student relative to a family concern such as: effective utilization of family resources; family decision making; family interaction and development throughout the family life cycle; cultural, economic and socio-psychological influences of clothing, textiles, equipment and housing of families; and effectiveness of institutions serving families.

The Ph.D. program is offered by the graduate faculty members of the departments of Clothing, Textiles and Interior Design; Dietetics, Restaurant, and Institutional Management; Family and Child Development; and Family Economics. 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. Students entering the program are required to show evidence of a broad background in home economics including course work in four of the five departmental areas in the College of Home Economics.

The Ph.D. program is administered by a Coordinating Committee composed of five graduate faculty members elected from the participating departments. The Coordinating Committee is responsible for implementation of policy regarding admission to the doctoral program, approval of major professor and supervisory committee members and review of guidelines for development of programs of study.

Inquiries should be directed: Chair, Coordinating Committee, Ph.D. in Home Economics Program, Justin Hall.

Parasitology

C.W. Pitts, Chairman

Professors Dickerson, Elzinga, Hansen, Harvey, Knutson, Kramer, Leland, Lindquist, and Pitts; Associate Professor Johnson.

Graduate study leading to the degrees Master of Science and Doctor of Philosophy in Parasitology is offered in the Division of Biology and the departments of Entomology, Infectious Diseases and Plant Pathology. Graduate courses related to parasitology



will be found listed under the above division and departments in this catalog. Supporting courses may be taken in any of the scientific disciplines or in other academic areas with approval of the parasitology faculty and the student's advisory committee.

One foreign language is required for the degree Doctor of Philosophy in Parasitology.

Facilities for research work in parasitology include rearing rooms; small and large parasite-free domestic animals; environmental control chambers; animal rooms; in vitro culturing; toxicology, physiology, and behavioral laboratories; scanning electron microscope, and field study areas.

Pathology

W.D. Lindquist, Chairman

Professors Anthony, Coles, Cook, Dennis, Kelley, Leipold, Leland, Lindquist, Oehme, Trotter, and West; Associate Professors Bailie, Burroughs, Keeton, Kruckenberg, Minocha, Moore, Smith, Strafuss, and Vestweber.

Graduate programs are offered by the departments of Pathology and Infectious Diseases in the College of Veterinary Medicine leading to the degrees of Master of Science and Doctor of Philosophy.

Facilities of the departments for advanced work include a clinical pathology laboratory; animal isolation units; parasitological, mycological, bacterial, viral, immunological, histopathological research laboratories; and laboratories in perinatal diseases and public health. There are extensive files of tissue slides and opportunities for experimental work with animals in studying diseases.

Requirements for entering graduate study in pathology and infectious diseases are completion of a four-year curriculum in veterinary medicine or equivalent training in basic sciences and approval of the interdepartmental graduate faculty.

There are no requirements for a reading knowledge of a foreign language.

Center For Aging

In 1975 the Kansas Board of Regents approved the establishment of a Center for Aging, which coordinates the University's resources and programs related to aging. More than 50 faculty members from 25 departments are associated with the center and carry out a variety of activities in teaching, research, and public service. Students wishing to pursue a program of study in the area of aging may address inquiries to Director, KSU Center for Aging, Justin Hall, Manhattan, KS 66506.

Intercollegiate Program in Women's Studies

The purpose of the women's studies program at K-State is to serve the needs of the student who wishes to take a series of courses emphasizing women within the context of traditional academic disciplines, and to provide official recognition through an intercollegiate interdisciplinary, secondary major for those who complete this course of study. The women's studies program recognizes that women are a legitimate subject for academic study. The study of women appropriately includes educational, sociological, anthropological, historical, economic, biological, familial, artistic, political, vocational and professional perspectives, but may include many other disciplines.

The women's studies program is a collection of courses supervised by an intercollegiate women's studies committee. The committee is chaired by the coodinator of women's studies, who also advises and keeps records for students from any college who wish to pursue this secondary major. To complete the secondary major, a student must take two required courses (Introduction to Women's Studies and Senior Seminar in Women's Studies) plus 18 semester hours in elective courses from the Colleges of Arts and Sciences, Business Administration, Education, and Home Economics, for a total of 24 semester hours. Elective courses must be taken in at least two colleges. The women's studies program also may serve to meet general education requirements. Courses listed below are those for which students may receive credit in the women's studies program. Other courses are being developed, and the course list will be up-dated regularly.

Intercollegiate Courses in Women's Studies:

* **105. Introduction to Women's Studies.** (3) I, II. Introduces the student to women's studies as an academic discipline. Demonstrates the philosophical background, presenting perspectives on the study of women: educational, sociological, anthropological, historical, economic, biological, psychological, familial, artistic and vocational/professional. Includes participation of faculty from cooperating departments and colleges. *105-0-4903

* **405. Senior Seminar in Women's Studies.** (3) I, II. An intercollegiate, interdisciplinary course organized topically 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. *405-0-4903

*200, College of Arts and Sciences; 305, College of Business Administration; 400, College of Education; 605, College of Home Economics.

Courses Comprising the Women's Studies Program:

Arts and Sciences:

Art

209 580. Women in Art

Biology

215 525. Topics in Biology: Science, Sex, and Society

English

229 525. Women in Literature

Health, Physical Education, Recreation

261 250. You and Your Sexuality

History

241 512. Women in European History
241 541. Women in American History

Modern Languages

253 506. French Women Writers

Political Science

269 706. Sex and Politics

Psychology

273 540. Psychology of Women

Sociology

277 545. The Sociology of Women
277 701. Problems in Sociology: Women in Latin America
278 622. Male and Female: Cross-cultural Perspectives

Speech

281 799. Problems in Speech: Women Playwrights

Business Administration:

305 590. Women in Business

Education:

405 686. Topics in Education: Programing for Women's Concerns

Home Economics:

Clothing, Textiles, and Interior Design

610 440. Socio-Psychological Aspects of Clothing

Family and Child Development

620 250. You and Your Sexuality
620 350. Family Relationships and Sex Roles
620 765. Human Sexuality

Family Economics

630 600. Economic Status of Women

Foods and Nutrition

640 603. Maternal and Child Nutrition

General Home Economics

650 385. Problems in General Home Economics: Women as Decision Makers

For more information about the secondary major in women's studies, contact Coordinator, Women's Studies Program, Eisenhower Hall, Kansas State University, Manhattan, KS 66506.

Honors Programs at Kansas State University

Students at Kansas State University may enroll in Honors Programs in four colleges of the University: Agriculture, Arts and Sciences, Engineering, and Home Economics.

QUESTIONS HONORS STUDENTS OFTEN ASK

1. *What is the purpose of KSU Honors Programs?* First, to identify gifted, enthusiastic, ambitious, highly imaginative students and to provide special courses which 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. These situations include special convocations which involve honors students from all honors programs of the University, and informal visits with guests to the campus, including Landon Lecturers.

2. *How do honors classes differ from regular classes?* It is difficult to answer this question fully, for like all other classes, honors classes differ among themselves. Nevertheless, we may say that 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.

3. *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 which has been challenging and exciting, whatever one's academic interests or professional goals. More specifically, the honors student may expect that his critical skills will have been sharpened and his 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, 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.

4. *What honors opportunities are available to me if I am enrolled in an Honors Program at KSU?* These opportunities may, perhaps, be best described in 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.

College of Agriculture. The Honors Program in the College of Agriculture is designed to encourage 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 agriculturalists 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 his or her program of study and in planning for independent research activities.

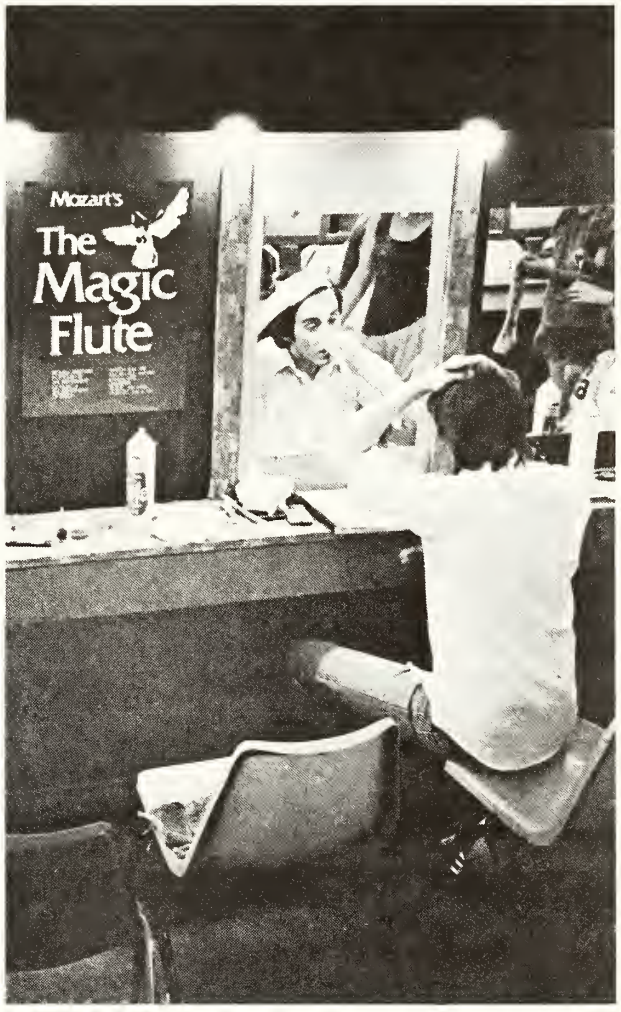
First semester freshmen or transfer students enroll in Honors Orientation, which outlines details of the Honors Program. This class also presents a variety of speakers and course experiences not normally available to students. Sophomores and transfer students may enroll in an Honors Colloquium in Agriculture, a course which encourages students to explore areas of mutual interest through forums, invited lecturers, visits to the campus by specialists in many fields, and other invited resource persons. Topics in the colloquium are selected by students and include problems of current local or national interest which are particularly significant for agriculture students. Upperclassmen also enroll for honors seminars which are lectures and special convocations selected by the student for his attendance from an approved list. Students attend 12 such convocations, many of which are of interest to the University as a whole, and report and discuss ideas gained from such convocations programs. Juniors and seniors are typically engaged in independent research. As a preliminary to this research, they enroll in Honors Research Planning, in which they develop methods of screening pertinent literature and tools for the preparation of research proposals. They also obtain a knowledge of research services available at KSU.

When an honors student's research has been completed, it is presented orally and in written form.

College of 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 non-credit seminar, Introduction to Honors 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.

Upon completing the seminar, achieving a grade point average of 3.5 in one semester of the freshmen year, and petitioning to join in writing, freshmen students are admitted. Transfer students may apply up to the beginning of the junior year and may be admitted upon individual evaluation. All members maintain a grade point average of 3.3.

Opportunities provided to students in the Arts and Sciences Honors Program range across the spectrum of courses and programs in the 24 departments of the college. Students complete the portion of their general studies requirements in specially planned seminars at the sophomore level. These have included in recent semesters such courses as the "Journey Motif in Literature," "East German Literature," "The Ethics of Investigative Journalism," "Creativity and Mathematics," and "The Computer Can Do *Everything*?" Students also take an interdisciplinary colloquium their junior year which may serve to meet a general studies requirement in the social sciences or the humanities. In the senior year students complete an individual research project or other documentation of performance under the supervision of a professor of their choice. This project, the Senior Honors Thesis, 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. The Senior Honors Thesis is a good example of the emphasis placed by the College of Arts and Sciences upon undergraduate research opportunities. Recent Senior Thesis topics have included such titles as the following: "The Mind/Brain Identity Theory," "Type A Behavior in Fourth and Fifth Graders: Effect of Control and Noncontrol on Behavior in a Simple Task," "Survey of Chimpanzee Communication Systems," "Nerve Growth in Dorsal Root Ganglia," and "Consumer Manipulation in Advertising."



In addition to the curricular options described above, 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.

College of 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 5% 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 which offer them opportunities for close association with faculty and with similarly gifted and motivated students in the College of Engineering.

In the sophomore and junior years students participate in a variety of seminars and colloquia which enrich and broaden their educational experience. Recent seminar and colloquium topics 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 the individual interests of honors students.

The culminating activity of the honors student is an independent research or design project which is carried out under the direction of a single faculty member. These projects provide not only close association with the faculty adviser but the opportunity to complete an extended investigation into a topic of personal interest and to express the creative abilities of the individual student. Among others, recent topics have included, "The Location of New Power Plants," "The Development of a Walking Robot," "Response Measurements in Nuclear Detection Equipment," "Economics of Wind Generated Power," and "A Crawler Designed for Cerebral Palsy Patients."

College of Home Economics. Students in the College of Home Economics are selected for membership in the Honors Program according to ACT scores or, in the case of transfer students and other upperclassmen, achievement of a requisite grade point average.

The program has several important objectives, one of which is to provide opportunities for students to explore areas outside the chosen area of concentration in Home Economics. Each member of the program completes two Home Economics Honors Seminars. These are taken within or outside the student's major. In the junior or senior year, students complete an honors project on a topic of their own choosing. They develop these projects with a Home Economics faculty member who serves as faculty adviser for the project and with the approval of the Home Economics 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 increase the student's knowledge in a particular field of his or her interest. Special seminars or mini-courses designed exclusively for Honors Program members are offered each semester. Some courses are experimental in nature and explore new areas in a subject matter field. Recent seminar topics include "Ethnic Influences in Textiles and Clothing," "Food Additives Update," "The Cultural Impact of Mass Feeding," "The Computer Comes to Home Economics," and "Fast Food Service: The Effect on a Family." Each spring the College of Home Economics presents an Honors Program Forum at which outstanding honors projects are presented by selected members and a student from each Home Economics Honors Seminar is recognized for the top paper or most outstanding contribution in the class. Abstracts of all honors projects completed by members are printed in an annual report, which is distributed to all members at the Forum.

Academic Honoraries. Major academic honorary societies on the Kansas State Campus include Phi Beta Kappa, the nation's oldest academic honorary, 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.

Major Scholarships

Kansas State students from throughout the University compete successfully for several well-known scholarship awards each year. These include 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 is another opportunity for students to win support for graduate study aboard. Winners are funded for two or three years of study at Oxford University in disciplines of their own selection. *The Danforth Awards* are made to students who plan a career in university teaching in a field in the liberal arts. They support students through the Ph.D. degree. Sophomores interested in a career in government may apply for the *Truman Award*, which is made annually to a student in each of the 50 states and which supports the last two undergraduate years as well as two years of graduate study.



College of Agriculture

Carroll V. Hess, Dean
David J. Mugler, Acting Dean
Frank R. Carpenter, Associate Dean
Lawrence H. Erpelding, Assistant Dean

Objectives

The College of Agriculture offers 16 Bachelor of Science degree programs and a total of 26 academic programs ranging from two years to the Ph.D. Some of the programs have four options: production, science, communications and business-industry. Other curricula such as Grain Science and Industry, Natural Resource Management, and Food Science and Industry offer three options. The many curricula and options provide flexibility to meet the needs of students who will be entering the broad field of professional agriculture. All programs are designed to bring about changes in students in the following areas:

1. **Knowledge and understanding.** Here the students are directed toward the mastery of one or more important areas of scientific agriculture. They gain understanding of supporting areas so that they can reason and grasp new technological developments, and assist in solving practical problems.

2. **Professional attitudes and orientation.** This phase of the students' education helps them identify with and understand professional agriculture, its ethics and goals, and how to continue learning through life.

3. **Skills.** Part of the student's training is the development of abilities and skills to perform tasks efficiently and expertly in the area of professional agriculture.

4. **Personal and leadership development.** An important part of each student's training is the development of an appreciation for the present-day civilization. The student needs to understand that many subject areas are required to solve some problems. He or she needs to develop and understand a philosophy of life and values and develop abilities to work with others in the role of leadership as well as being a supporter of 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. This broad profession also includes areas such as soil physics, animal nutrition, cereal chemistry and land economics. Examples of positions held by recent agriculture graduates are:

1. Superintendent, flour mill
2. District sales manager, feed company
3. Research director, fertilizer manufacturer
4. County extension agricultural agent
5. Produce manager, retail food chain
6. Beef editor, farm magazine
7. Vocational agriculture instructor
8. Farm appraiser and loan officer
9. Graduate student, for Ph.D.
10. Fieldman, farm management company
11. Technical representative, pesticide company
12. Work unit conservationist, SCS, USDA
13. Commission salesman, livestock market
14. Editor, flower and garden magazine
15. Assistant manager, meat department
16. Economist, Foreign Agricultural Service, USDA
17. Farm or ranch manager
18. Owner, city flower shop
19. Medical entomologist
20. Meat inspector

The Faculty

More than 95 per cent 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. Such integration of teaching, research and extension helps insure that courses are current, factual 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 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.

Agriculture Honors Program

In agriculture the honors program 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. Students with high academic records are invited into the honors program.

The honors program is a method of intensive self-directed study, not a method of search. The student wishing to enter the program should have fairly definite educational goals.

Objectives:

1. To increase the scope of educational attainment by providing a program in greater breadth and depth.
2. To provide special recognition for outstanding scholastic achievement.
3. To foster a sustained interest in advanced education and research.

Eligibility:

Students in the College of Agriculture may petition to enter the honors program when they have completed 12 or more hours with a cumulative GPA of 3.4 or higher at Kansas State University.

Student Selection of a Major

Students usually select a curriculum or major at the time they enter the college. They are provided an academic adviser in their major field. 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 adviser who is a representative of the dean's office. These students are urged to choose a major before the close of the freshman year.

A student may change curriculum or major at almost any time and with relative ease, though a change after the sophomore year may delay graduation.

Some programs are closely related to agricultural resources and products. For example, agronomy is related to crops and soils; and animal sciences and industry to livestock and livestock products.

Electives permit adaptation of the program to the student's goals.

A student planning to farm, for example, might enroll in any one of several majors and work with an adviser in developing an academic program most effective and valuable. One who wants to write for a flower and garden magazine might major in agricultural journalism and minor in horticulture, or vice versa.

Many students work part time in the laboratories, greenhouses and on the farms. This experience adds greatly to students' learning and understanding.

General Agriculture

Students who are undecided regarding the selection of a major in agriculture may want to enroll in general agriculture. Courses taken while in this area are selected with the help of an adviser 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:

Semester Course Load:

Example I:

English Composition I	3
Ag Orientation	1
Principles of Animal Science	3
College Algebra	3
Plant Science	4
Concepts in Phys. Ed.	1
	15

Example II:

Principles of Ag. Economics	3
Ag Orientation	1
Chemistry I or General Chemistry	4 or 5
Intermediate Algebra	3
Home Horticulture	2
Concepts in Phys. Ed.	1
	14 or 15

Example III:

Oral Communication I	2
Ag Orientation	1
Economics I	3
Agricultural Mechanics Practices	2
Graphic Communications I	2
Introductory Food Science	3
	13

Professional Programs in Agriculture

	page
1. Agricultural Economics; B.S., M.S., Ph.D.	52
2. Agricultural Education (teaching); B.S.	55
3. Agricultural Journalism; B.S.	56
4. Agricultural Mechanization; B.S.	56
5. Agronomy (Crops and Soils); B.S., M.S., Ph.D.	58
6. Animal Sciences & Industry; B.S., M.S., Ph.D.	61
7. Bakery Science & Mgmt.; B.S.	72
8. Crop Protection; B.S.	65
9. Crop Protection; M.S.	39
10. Dairy Production; B.S., M.S.	62
11. Entomology; m.s., Ph.D.	66
12. Feed Science & Mgmt.; B.S.	73
13. Food Science; M.S., Ph.D.	40
14. Food Science & Industry; B.S.	68
15. Genetics; M.S., Ph.D.	41
16. Grain Science; M.S., Ph.D.	72
17. Horticulture; B.S., M.S., Ph.D.	76
18. Horticultural Therapy; B.S., M.S.	77
19. Milling Science & Mgmt.; B.S.	74
20. Natural Resource Management; B.S.	80
21. Plant Pathology; M.S., Ph.D.	81
22. Poultry Science; B.S., M.S.	61
23. Pre-Forestry (2 years)	70
24. Pre-Veterinary Medicine (2 years)	52
25. Retail Floriculture (2 years)	77

Options and Courses Required In Agricultural Journalism, Agricultural Mechanization, Agronomy and Animal Sciences & Industry, including Meat Animal, Dairy Production, Poultry and Animal Products Specializations.

Courses	Science Option	Business and industries Option	Production Option	Communications Option
Agriculture:				
Soils Plant Sci. or Crop Sci. Prin. An. Sci. Prin. Ag. Econ. A course in Ag Engineering Econ. Entomology or Lvstk. Entomology Plant Pathology or Int. Plant Pest Control Natural Resources and Man Int. Food Science and Technology	Five of the courses listed	Prin. Ag. Econ.[1] & second Ag. Econ. course plus three other courses listed[2]	Five of the courses listed	Four of the courses listed[2]
Biological Science:				
Gen. Botany[3] Organismic Biology Genetics Microbiol.	Gen. Botany plus two other courses listed	Gen. Botany plus one other course listed	Gen. Botany plus one other course listed	Principles of Biology or Gen. Bot. and one other course listed
Mathematics, Statistics, and Computer Science:				
Plane Trig Calc. I Biometrics I[4] Fund. Comp. Prog.	Plane Trig. plus two other courses listed	Two of courses listed	One of courses listed	One course in statistics or computer science
Physical Science:				
Desc. Physics Physics I Physics II Geology I				
Chem. II Chem. Anal. Elem. Org. Chem. Gen. Org. Chem. Org. Chem. I Intro. Org. Chem. & Biochem. Elem. Biochem. Gen. Biochem.	One course from each of three of the four groups	One of the courses listed	Two of courses listed, including one Org. Chem. course or the course Intro. to Org. & Biochem.	One physical science listed
Business Administration and Agricultural Economics:				
Small Business Operations Managerial & Cost Controls Business Law I Management Concepts Marketing Sales Management Money & Banking Labor Economics Economic Principles of Agricultural Business Firms Prin. of Transportation All other courses in Ag. Econ. with a 500 or higher course number	Fund. of Accounting	Fund. of Accounting plus 4 courses listed	Fund. of Accounting plus 1 course listed	Fund. of Accounting plus 1 course listed

1. Econ. II may substitute.
2. Plants and Soils for Crop Production may be taken in lieu of either Soils or Crop Science in the Business and Industries and the Communications Options.
3. Principles of Biology may substitute.
4. Stat. Meth. I may substitute.

Science Option

(Preparation for Research & Graduate Study)

Nearly 20 per cent 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, economics, and in communications.

Business and Industries Option

Nearly one-third of the recent graduates of the College of Agriculture are now employed in off-farm agribusiness, such as salesmen, plant superintendents, buyers and writers. This shows that 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 Option

Nearly 30 per cent of recent graduates return to the farm or ranch. Those who plan to do so should consider their future community responsibilities and the changing characteristics of farming as they select their courses. Farmers will want 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.

Communications Option

This option provides the student with some professional skill in journalism and mass communications. These courses are organized to give the student an introduction to news writing and editing. The three areas of specialization allow the student to select more advanced communications courses according to interests and needs. Such additional skills and abilities will make the student more effective in active citizenship roles and more proficient in his or her profession.

Communications Courses
(15 credit hours required)

Reporting I (3), **Reporting II** (3) and **Editing I** (3) plus six additional credit hours from the following listings which suggest areas of specialization students may choose to pursue.

Advertising and Sales Communications

Principles of Advertising	3
Advertising Media	2
Advertising Copy & Layout	3
Administrative Communications	3
Sales Communications	3
Design I	2
Commercial Art Techniques	2

Organizational Communications

Oral Communications II	2
Persuasion	3
Group Discussion Methods	3
Discussion and Conference Leadership	3
English Composition III	3
Introduction to Instructional Media	1
Audio-Visual Instruction	2-3

Mass Communications

Editing II	3
Magazine Article Writing	3
Magazine Production	3
Public Relations	3
Public Information Methods	2
Photojournalism I	3
Ag. Student Magazine	1-3
Fundamentals of Radio-Television Production	3
Fundamentals of Radio-Television Performance	3
Radio-Television Continuity	3
Reporting II (Radio-Television)	3

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 Economics I)
English—Any except courses in composition
Family and Child Development—Any course
Geography—Any except Environmental Geography I and II
History—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 and Anthropology—Any course
Speech—Any course in theater and interpretation

Suggested Additional Communications Courses

035 410 Agricultural Student Magazine (1-3)
229 200 English Composition III (3)
281 226 Argumentation and Debate (3)
281 220 Oral Communication II (2)
281 726 Persuasion (3)
281 727 Group Discussion Methods (3)
289 235 Survey of Mass Media (3)
289 275 Reporting I (3)
289 250 Agricultural Journalism (3)
290 240 Fundamentals of Radio-Television Production (3)
290 250 Fundamentals of Radio-Television Performance (3)
305 391 Administrative Communications (3)
305 543 Sales Communications (3)
410 752 Principles of Teaching Adults in Extension (3)

Agriculture And Business Administration Degree Combinations

The agribusiness complex of industries (processing, preservation, distribution and retailing of farm-produced food, and manufacture and sale of farm-used equipment, feeds and agricultural chemicals) employs a variety of professionally-trained personnel in increasing numbers. Type of education required ranges from general business or accounting to professional and scientific agriculture to biological and physical sciences. Intensity of education needed ranges from the B.S. degree to the Ph.D. degree.

Agricultural businesses have expanded in size and number in Kansas. The College of Business Administration and College of Agriculture have identified the following programs that will prepare young people for some of the jobs in this vast complex. Academic years listed are estimates.

1. A Bachelor of Science degree in some discipline within the College of Agriculture, followed by a Master's degree in business administration (see p. 202) 5½ academic years.
2. A Bachelor of Science degree in some discipline within the College of Agriculture, followed by a B.S. degree in business administration (see p. 200) 5 academic years.
3. A Bachelor of Science degree in some discipline within the College of Agriculture, including in the degree program a group of courses in business administration (see options and areas of study on page 200) 4 academic years.
4. A Bachelor of Science degree in business administration, including in the degree program a group of elective courses in some discipline within agriculture.

5. A Bachelor of Science degree in business administration, followed by a B.S. or a master's degree in some discipline with agriculture. 5 or 6 academic years.

To take advantage of one of these programs, students would enroll in the College of Agriculture or the College of Business Administration. The B.S. program would be based on degree requirements listed in the respective college section of the catalog, and would need to be approved by the academic adviser and dean. If they pursue a second B.S. or a master's degree, the students would transfer to the second college following receipt of the first degree.

For Prospective Transfer Students

About 40 per cent of new students entering the College of Agriculture are transfer students from a junior college or denominational college.

The 63 semester hours listed below, with exceptions and variations noted, can be transferred to any of the professional programs listed below and a degree earned in four additional semesters by capable students with good academic records.

All curriculums have opportunities for general electives. Students can take a few courses, other than those listed below, and have them apply toward the B.S. in agriculture.

A number of community colleges in Kansas offer introductory agriculture courses approved for transfer toward a B.S. degree in agriculture.

Professional B.S. Programs in Agriculture

1. Agricultural Economics; B.S., M.S., Ph.D.
2. Agricultural Education (teaching); B.S.
3. Agricultural Journalism; B.S.
4. Agricultural Mechanization; B.S.
5. Agronomy (Crops and Soils); B.S., M.S., Ph.D.
6. Animal Sciences & Industry; B.S., M.S., Ph.D.
7. Bakery Science & Management; B.S.
8. Crop Protection; B.S., M.S.
9. Dairy Production; B.S.
10. Feed Science & Management; B.S.
11. Food Science & Industry; B.S.
12. Horticulture; B.S., M.S., Ph.D.
13. Horticultural Therapy; B.S.
14. Milling Science & Management; B.S.
15. Natural Resource Management; B.S.
16. Poultry Science; B.S.

Suggested basic courses:

Course	Semester Hours
English I & II	6
Speech	2
Other communications such as Journalism or a second speech course (For Bakery Science and Management, Food Science and Management, or Milling Science and Management, replace with a semester of inorganic chemistry or organic chemistry, or engineering graphics.)	3
College Algebra	3
Trigonometry (Required only in Professional Programs, numbers 4, 7, 8, 10, 11, 14 and 15.)	3
Calculus (Required only in chemistry and operations options of 7, 10, and 14.)	5
Chemistry (Inorganic) (Eight hours required in all except that only five hours are required in 1, 2, 3, 4, 6, 8, 9, 12, 13 and 16.)	8
Organic Chemistry (Not required in 1, 3, 4, 12, 13, 16 and option "B" of 15.)	3
Economics I	3
General Physics (Required only in 4, 7, 8, 10, 11 and 15.)	5
Humanities and Social Sciences	9
Biological Science (Required in all except that only five hours are needed in 1, 7, 13, 14 and 15. None required in 4.)	10
Electives	3
	63

Dual Degrees

Students desiring a B.S. degree in some discipline in agriculture and a B.S. degree in some other college at K-State will need to complete the requirements for each degree and a minimum of 150 semester hours.

Pre-Veterinary Medicine Program* **

Freshman	
Ag Orientation	1
Chemistry I	4
English Composition I	3
Principles of Animal Science	3
Animal Sciences and Industry	1
Dairy Science	1
Concepts in Physical Education	1
	14
Prin. of Biology	4
Chemistry II	4
Plane Trigonometry	3
Humanities or Social Science Elec.	3
English Composition II	3
Poultry Science	1
	18
Sophomore	
Physics I	4
General Organic Chemistry	5
Humanities or Social Science Elec.	6
Oral Communication I	2
	17
Physics II	4
Genetics	3
Humanities or Social Science Elec.	3
Chemical Analysis	4
General Elective	1
	15

* Students who satisfactorily complete the Pre-Veterinary Medicine program above 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.

Departments & Course Offerings

AGRICULTURAL ECONOMICS

Paul L. Kelley, Head of Department*
Edgar S. Bagley, Assistant Head, Teaching and Graduate Studies*
Donald B. Erickson, Assistant Head, Extension*

Professors Erickson,* Kelley,* Langemeier,* Manuel,* McCoy,* Norman,* Orazem,* Phillips,* Pine,* Schlender, Schruben,* Sjo,* Sorenson,* and Whitehair;* Associate Professors Biere,* Bogle, Buller,* Figurski, Flinchbaugh, Frederick, Knight,* Koudele,* McReynolds, and Walker; Assistant Professors Barton, Brandsberg, Overley, Parker, Pretzer, Riley,* and Schurle. Emeritus: Dean Howe;* Professors Coolidge, Montogomery,* and Thomas; Associate Professor Otto.*

Undergraduate Study

B.S. in Agriculture; requires 127 semester hours

Agricultural economics, as a social science, is concerned with administration and management in agriculture. The curriculum in agricultural economics provides an opportunity to explore these areas in depth. Nearly one-half the requirements are electives. This provides flexibility for the student and adviser to develop a program of study meeting

the interests, needs and career objectives of each student. Transfer students from junior colleges, from other majors and from the general agriculture program should find this flexibility well-suited to their needs.

The curriculum in agricultural economics has three options for specialization: (1) agricultural business (including both farm and agribusiness management), (2) agricultural programs and (3) professional agricultural economics.

Agricultural Business. Students interested in combining agriculture and business management for agribusiness management or for farm management careers find this option places emphasis on agriculture, economics and business administration courses. Those interested in farm management may give more emphasis to livestock production, crop production or farm machinery than those interested in agribusiness. About 40 per cent of agricultural economics graduates will find employment in agribusiness such as banking, management, sales, finance, credit and insurance. About 20 per cent will work with farm production problems as farmers, farm managers or farm advisors.

Agricultural Programs. A student seeking a career in public administration and service in agriculture such as county extension, information (radio, TV or the press), federal or state agricultural and environmental programs, and international agriculture will find the agricultural programs option provides the opportunity to emphasize courses in administration, communications and public policy along with courses in agriculture and agricultural economics. Students may use the agricultural programs option as a pre-professional course of study for fields such as law or theology.

Professional Agricultural Economics. Students with good academic backgrounds (B+ or better) who are interested in teaching, research and extension work as agricultural economists will find the professional agricultural economics option provides the opportunity to study techniques of economic analysis. Complementary to the emphasis on economic theory, the student builds his skills in methods of analysis through courses in mathematics, statistics and computer science.

General Requirements. All options have the following common course requirements with the special requirements listed separately under each option. It is suggested students follow courses in the sequence.

Department Requirements

229 100	English Composition I	3
229 120	English Composition II	3
281 105	Oral Communication I	2
245 100	College Algebra	3
221 110	General Chemistry	5
261 001	Concepts in Phys. Ed.	1
	Humanities[1]	6
269 110	Principles of Political Science	3
277 211	Introduction to Sociology	3
215 198	Principles of Biology	4
	Agriculture[2]	12
225 110	Economics I	3
	Computer Programming	3
	One communications course[1]	3
271 110	General Psychology	3
305 206	Fundamentals of Accounting	3
245 500	Introduction to Analytical Processes	3
	Supporting Electives[1]	15

Major Courses

010 100	Principles of Agricultural Economics[3]	3
010 480	Agricultural Economics Statistics	3
010 500	Production Economics	3
010 505	Agricultural Market Structures	3
	Major Electives[1]	15

Depending upon the option chosen and the student's professional interests and objectives, he may select with the consent of his adviser, courses from the following areas:

Professional Agriculture
Business Administration
Extension Education
Economics, Political Science, Sociology, and Psychology
General Electives 22

These may be selected by the student with the consent of his adviser to fulfill the student's personal educational interests and objectives.

1. To be selected with the advice and consent of the student's adviser.
2. To be selected from 020 102 Principles of Animal Science, Crop Science, Plant Science or Plant Science, Soils, Introductory Food Science & Technology, Engineering in Agriculture.
3. A second introductory general economics course may be substituted, i.e., Economics II.

Graduate Study

Graduate study leading to the degrees Master of Science and Doctor of Philosophy is offered in the department. Research for these may be in marketing, farm management, finance, land economics, conservation, prices, production economics, taxation, agricultural policy, international development, agricultural business and industry and in other areas.

Prerequisite to graduate work in agricultural economics is acceptable undergraduate credit in economics; (including agricultural economics, mathematics and statistics). Graduate students majoring in agricultural economics take courses in general economics as well as in agricultural economics.

Courses in Agricultural Economics

Undergraduate Credit (no prerequisite—open to all University students)

010 100. Principles of Agricultural Economics. (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. 010-100-0-0111

Undergraduate Credit

010 441. Agricultural Economics Seminar. (Var.) Seminars of special interest will be offered upon sufficient demand in the areas of (a) Farm Management, (b) Marketing, (c) Land Economics, (d) Policy, (e) other selected areas. Pr.: Consent of the instructor. 010-441-0-0111

010 480. Agricultural Economics Statistics. (3) I, II. Principles and methods involved in the collection, analysis, interpretation, and presentation of statistical materials, with special reference to agricultural economics data. Two hours rec. and two hours lab. a week. Pr.: Econ. 110 and Math. 100. 010-480-1-7-0111

Undergraduate Credit And Graduate Credit In Minor Field

010 500. 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. Ag. Econ. 505 is a continuation of this course and they are intended to be taken in consecutive semesters. Three hours rec. a week. Pr.: Ag. Econ. 100 or Econ. 120. 010-500-0-0111

010 505. Agricultural Market Structures. (3) I, II. Continuation of Ag. Econ. 500. 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.: Ag. Econ. 500. 010-505-0-0111

010 508. Farm and Ranch Management. (3) I, II. Organization and management of a ranch or farm; selection of a livestock system; economics of size of business; financial management of the business. Restricted to non-majors. Pr.: Econ. 110. 010-508-1-7-0111

010 510. Agricultural Policy. (3) I. Analytical treatment of recent and current economic problems and governmental policies and programs affecting American agriculture; will include price and income problems, rural development, and rural poverty. Three hours rec. a week. Pr.: Junior standing. 010-510-0-0111

010 511. Consumption Economics in Agriculture. (3) I. Factors determining consumption patterns of individuals and households; contributions of economics and other social sciences in study of consumer behavior; macroeconomics of food consumption and distribution; consumption analysis related to problems of agriculture. Three hours rec. a week. Pr.: Econ. 110. 010-511-0-0111

010 512. Farm Management. (3) I, II. Principles and practices of organization and management; nature and structure of business; functions and operations; management tools; decision making processes. Two hours rec. and two hours lab. a week. Pr.: Ag. Econ. 500. 010-512-1-7-0111

010 513. Farm Resource Acquisition and Finance. (3) I. Acquisition of resources needed for farms and ranches through purchasing, leasing, and other contractual arrangements; financing resource acquisition; resource market structure and pricing; financial management. Three hours rec. a week. Pr.: Econ. 110. 010-513-0-0111

010 514. Economics of Food Marketing. (3) I. Problems of assembly of farm products for processing and the marketing of the final food products. Special attention will be given to the economics of food marketing in relation to commodity and functional approaches to the food marketing system. Three hours rec. a week and field trips. Pr.: Econ. 110. 010-514-0-0111

010 516. Agricultural Law and Economics. (3) I, II. The legal framework impinging upon decision making by farm firms, families and individuals; liabilities, real and personal property, contracts, uniform commercial code, organization of farm firms, intergeneration 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. 010-516-0-0111

010 517. 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; to 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, B.A. 260 and junior standing. 010-517-1-7-0111

010 518. Economic Principles of Agricultural Business Firms. (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.: Ag. Econ. 100 or Econ. 120 and B.A. 260. 010-518-0-0111

010 520. Grain Marketing. (3) I. The general areas covered include 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. 010-520-0-0111

010 521. 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. 010-521-0-0111

Undergraduate And Graduate Credit

010 600. Bargaining and Cooperation in Agriculture. (3) I. A study of collective bargaining and cooperative activity in agriculture. Other marketing institutions such as marketing orders, marketing agreements, and agricultural marketing boards will be included. Emphasis is placed upon assessing the potential of these marketing techniques to strengthen the economic position of farmers in the economy. Three hours rec. a week. Pr.: Junior standing. 010-600-0-0111

010 615. 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. 101-615-0-0111

010 625. Natural Resources Economics. (3) I. Supply and demand for natural resources; optimal development, use and conservation of natural resources within welfare economics; benefit-cost analyses; public and private ownership and control over natural resources; particular attention given to recreational use of resources, forests, wildlife, and urban uses of natural resources; quality, esthetic, and other non-market factors associated with natural resources. Three hours rec. a week. Pr.: Econ. 110 and junior standing. 010-625-0-0111

010 631. 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. 010-631-0-0111

010 632. Principles of Traffic Management. (3) I. Planning for efficient use of transportation facilities in the movement of raw materials and products, controlling shipments in coordination with warehouse and handling operations, and scientific selection of routes, schedules and equipment. Pr.: Econ. 110 and junior standing. 010-632-0-0111

010 635. Economics of Community Development. (3) I. A study of the economic process of community development. Major emphasis on small rural communities and their responsibility to provide public services to their residents. The role of residents in the development process. Three hours rec. per week. Pr.: Econ. 110 and junior standing. 010-635-0-0111

010 636. Economics of Resource Policy. (3) II. Study of natural and human resource condition of the United States and world. Emphasis on nonrenewable (oil, minerals) and human resources. Historical and economic evaluation of resource use policies and their impact on economic welfare of the nation and world. Pr.: Econ. 110 and junior standing. 010-636-0-0111

010 641. Agricultural Economics Seminar. (Var.) S. Seminars of special interest will be offered upon sufficient demand in the areas of (a) Farm Management, (b) Agricultural Finance, (c) Marketing, (d) Land Economics, (e) Policy, (f) other selected areas. Pr.: Consent of instructor. 010-641-0-0111

010 676. Tax Planning for Agriculture. (3) II. Legal requirements to compute gross farm income, deductions, losses, expenses and depreciation. Tax implications of taxation of farm corporations and their shareholders; partnerships and cooperatives; federal estate tax; Kansas inheritance tax; state and local taxation as related to the farm. Pr.: Econ. 110 and junior standing. 010-676-0-0111

010 705. Price Analysis. (3) II. The analysis of selected agricultural prices; application of regression analysis to price analysis and special econometric considerations. Two hours rec. and two hours lab. a week. Pr.: Ag. Econ. 480 and 500. 010-705-1-0111

010 710. Quantitative Methods in Agricultural Marketing Firms. (3) I. Application of mathematical programming and other operations research techniques to practical management problems in agriculture. Two hours rec. and two hours lab. a week. Pr.: Ag. Econ. 518 or consent of instructor. 010-710-1-0111

010 712. Economic Analysis of Farm Firms. (3) II. Analysis of optimum resource use in agriculture; application of linear programming and related topics for decision making. Pr.: Ag. Econ. 500. 010-712-0-0111

010 750. Agricultural Economics Problems. (Var.) I, II, S. Pr.: Consent of instructor. 010-750-3-0111

Graduate Credit

010 811. Seminar in Agricultural Policy. (3) I. An analysis of the relation of government to the economic aspects of farming as individual enterprise and agriculture as an industry, including the international aspects of United States agriculture. Pr.: Consent of instructor. 010-811-0-0111

010 823. 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.: Ag. Econ. 500 or consent of instructor. 010-823-0-0111

010 829. Seminar in Land Economics. (2) I. Comprehensive analysis of problems dealing with the control and use of public and private land resources. Pr.: Consent of instructor. 010-829-0-0111

010 831. 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. 010-831-0-0111

010 832. Agricultural Marketing Organization and Institutions. (3) I. A study of the competitive framework, firm behavior, and economic performance in agricultural product and factor markets, including an analysis of institutional arrangements, legal restraints, and marketing control programs. Pr.: Econ. 510 or consent of instructor. 010-832-0-0111

010 898. Agricultural Economics Master's Report. (Var.) I, II, S. Master's report. 010-898-4-0111

010 899. Agricultural Economics Master's Research. (Var.) I, II, S. Research for master's thesis. 010-899-4-0111

010 901. Seminar in Economic Research. (3) I. The scientific reasoning underlying the selection of research problems, the formulation and testing of hypotheses, and the evaluation and presentation of results. Pr.: Consent of instructor. 010-901-0-0111

010 922. 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. 010-922-0-0111

010 940. Seminar in Agricultural Economics. (3) On sufficient demand. Problems and current developments in agricultural economics. Pr.: Consent of instructor. 010-940-0-0111

010 999. Agricultural Economics Ph.D. Research. (Var.) I, II, S. Research for Ph.D. dissertation. 010-999-4-0111

AGRICULTURAL EDUCATION

Advisers—Albracht, Field, Welton

B.S. in Agriculture; requires 127 sem. hrs.

Agricultural Education is for those who are interested in educational work in agriculture. Students who complete the curriculum as outlined are certified to teach vocational agriculture in public schools. Many graduates perform the educational function in community junior colleges, area vocational schools, or as county agents or agribusinessmen.

FRESHMAN

Fall Semester		Course	Sem. Hrs.
Gen. Agr.	035 101	Ag Orientation	1
English	229 100	English Composition I	3
Mathematics	215 198	College Algebra	3
Biology	215 198	Principles of Biology	4
		Ag. Science Elec.	4
Physical Education	261 101	Concepts in Phys. Ed.	1
			16
Spring Semester			
English	229 120	English Composition II	3
Psychology	273 110	General Psychology	3
Chemistry	221 110	General Chemistry	5
Horticulture	040 200	Plant Science	4
		OR	
Agronomy	015 220	Crop Science	4
			15

SOPHOMORE

Fall Semester			
Biology	215 201	Organismic Biology	5
Ag. Engg.	506 151	Ag. Mechanics Practices	2
Education	405 215	Educational Psychology I	3
Economics	225 110	Economics I	3
Speech	281 106	Oral Communication IA	3
			16
Spring Semester			
Biochemistry	211 120	Intro. Bio. & Org. Chem.	5
Agronomy	015 305	Soils	4
		Ag. Science Elec.	3
Ag. Engg.	506 351	Farm Power	3
			15

JUNIOR

Fall Semester			
Ag. Ec.	010 100	Prin. of Ag. Econ.	3
Education	405 315	Educational Psychology II	3
		Literature or Language	3
		Ag. Science Elec.	3
		Social Science Elec.	3
			15
Spring Semester			
Education	410 620	Prin. & Phil. of Voc. Ed.	3
Journalism	289 250	Agricultural Journalism	3
		Ag. Science Elec.	3
		Ag. or Ag. Engg. Elec.	3
		General Elec.	3
			15

SENIOR

Fall Semester			
Education	410 621	Prog. Plan. in Voc. Ed.	3
Education	410 500	Methods of Teaching Ag.	2
Education	410 586	Tchg. Partic. Sec. Sch.	8
Ag. Engg.	506 559	Ag. Mechanic Methods	3
Ag. Engg.	506 553	Ag. Machinery Operation	3
			19
Spring Semester			
		Ag. or Ag. Engg. Elec.	2
		General Elec.	3
		Social Science Elec.	3
		Ag. Science Elec.	8
			16

Specialty Certification. Special certification is available for those who wish to prepare for positions in multi-teacher departments. The combination of 16 required and elective credit hours in agricultural sciences from one of the following areas is required for specialty certification:

1. Animal Sciences
2. Crops and Soils
3. Horticulture
4. Ag. Mechanics
5. Agri-Business (Cr. from Ag. Econ and B.A.)

Eight weeks during the first or second semester of the senior year are devoted to full-time student teaching. On-campus courses meet extra periods while the student is on campus, so there are no other academic responsibilities while teaching. When student teaching is taken in the spring, fall semester courses are moved to spring semester. See "Admission to Teacher Education" and "Admission to Student Teaching" in College of Education section of this catalog.

AGRICULTURAL JOURNALISM

Adviser—Holt
B.S. in Agriculture; requires 127 sem. hrs.

The race against hunger in many parts of the world has transformed agricultural reports into front page news. Agricultural journalists throughout the world are busy interpreting new developments—not only to farm people, but also to city people, just now beginning to realize that the strength of the land is their strength.

Rapid changes in agricultural science, production, and marketing must be relayed quickly and accurately to people who need to know. Today that's almost everyone.

The demand continues strong for trained agricultural journalists who understand and can interpret and report vital agricultural news. Graduates can take their pick of newspapers, magazines, radio or television stations, or government and university information staffs.

Students majoring in this curriculum take the following courses:

English Composition I	3
English Composition II	3
Oral Communication I or IA	2 or 3
Ag Orientation	1
College Algebra	3
Economics I	3
Chemistry I or General Chemistry	4-5
Concepts in Phys. Ed.	1
Humanities and/or Social Science	12

Agriculture Course Requirements: Students select one of the following options: science, production, business and industry or communications options as listed on page 51, except that physics is not to be included as a possible physical science course.

Agriculture courses required include those courses listed on page 49 under the option selected, plus two courses above the introductory level in one area of professional agriculture. Additional agriculture electives may be chosen by the student in consultation with the faculty adviser.

Students who select the communications option do not take the areas of specialization in communications, page 51, but do take the following group.

Journalism and Mass Communications Requirements (30-33 hours)

Core (Required of all)	
Reporting I	3
Reporting II (Print)	3
Editing I	3
Fundamentals of Radio-TV Production OR	3
Fundamentals of Radio-TV Performance	3
	12

Remaining 18-21 hours in journalism may be chosen by the student in consultation with the faculty adviser. Note: The course Agricultural Journalism (280 250) is not open to majors in agricultural journalism.

AGRICULTURAL MECHANIZATION

Advisers—Baugher, G. Larson, Lipper, Stevenson
B.S. in Agriculture; requires 127 sem. hrs.

Agricultural Mechanization courses are concerned with the application of power units, machines, buildings, equipment and engineered production systems for agriculture and with making productive use of and conserving our soil, water and energy resources. Courses stress learning how to acquire and use information needed for problem solving and developing independent and logical thought processes. They aim to cultivate the student's confidence in being able to apply familiar concepts from the agricultural and mechanical sciences to a broad range of agri-mechanical and agribusiness problems. A background in production agriculture is useful but not essential.

Academic programs may be planned to emphasize soil and water management, irrigation, animal production facilities or power and machinery related areas such as tillage, planting and harvesting. Students enrolled in this major are required to select a minor area in one of the agricultural sciences. Additional electives may be used to enhance mechanical skills or to concentrate further in some area of production agriculture or business administration.

Agricultural Mechanization is administered through the Department of Agricultural Engineering. Agricultural engineering faculty and courses for students in the College of Engineering are given on page 244. Page 235 gives the curriculum in agricultural engineering.

Students specializing in other fields may elect one or more of the agricultural mechanization courses to complement their academic programs. The courses are directed toward engineering applications, planning, servicing and management rather than toward engineering design.

General Requirements

English Composition I	3
English Composition II	3
Oral Communication I	2
Ag. Orientation	1
College Algebra	3
Plane Trigonometry	3
Economics I	3
General Chemistry or Chemistry I	4-5
General Physics I	4
Concepts in Physical Education	1
Communications Elective (see page 51)	2-3
Social Sciences and Humanities (see page 51)	12

Major Courses

Agricultural Machinery Management	3
Farm Power	3
Farmstead Utilities	3
Planning and Management of Ag. Buildings	3
Conservation Surveying and Planning	3
SELECT AN ADDITIONAL 10 HOURS FROM THE FOLLOWING:	
Agricultural Mechanics Practices	2
Tillage-Planting Machinery	2
Crop Harvesting and Handling Systems	2
Agricultural Machinery Construction	3
Farm Building Construction	3
Farm Animal-Waste Management	3
Managing Farm Grain and Forage	3
Irrigation Practices	3

Supporting Courses

Principles of Animal Science	3
Plant Science or Crop Science	4
Principles of Agricultural Econ. or Econ. II	3
Fundamentals of Accounting	4
Graphic Communications, Analysis & Design	2
Plus an additional Business Administration course[1]	

Additional Requirements

1. Production Option

Principles of Biology or General Botany	4
Introductory Organic and Biological Chem.	5

One of the following biological science courses: Organismic Biology, Genetics, Environmental Biology, Microbiology, a course in Plant Pathology or Entomology. Students select a minor area to give a total of 12 hours in one of the following:

1. Agricultural Economics and Journalism
2. Agronomy, Entomology, Horticulture and Plant Pathology (Courses taken to fulfill this requirement may not be used to fulfill biological science requirement.)
3. Animal Sciences and Industry, Dairy and Poultry Science.

2. Communications Option

Requirements are the same as for the Production Option except that communications courses as listed under "Communications Option," page 51 of the catalog, must be included in the minor area or as other electives.

3. Business and Industry Option

One mathematics, statistics or computer science course.[1] At least two courses in Business Administration and three courses in Agricultural Economics beyond those listed in Supporting Courses.[1] At least eight more hours selected from courses offered in the following colleges or departments: Economics, Agricultural Economics, Business Administration and Industrial Engineering.[1]

A specialization in irrigation is available in any of the options by including the following courses in the electives selected.

Production Economics or Farm Management	3
Management of Irrigated Soils	3
Integrated Pest Management	3
Irrigation Practices	3

1. Selected by the student with the consent of his adviser.

Graduate Study

Graduate study leading to the degree Master of Science is offered. Prerequisite is the completion of an undergraduate curriculum substantially equivalent to requirements for one of the options shown above.

Agricultural Engineering

Courses for Students in Agriculture

Undergraduate Credit

506 151. Agricultural Mechanics Practices. (2) I, II. Introduction to mechanics practices and techniques basic to the repair, maintenance and construction of agricultural facilities and equipment, including oxyacetylene and arc welding, tool conditioning, soldering, power tool operation such as drill press and metal lathe. Six hours lab. a week. 506-151-1-0998

506 300. Engineering in Agriculture. (4) I, II. Engineering principles as applied to farm power and machinery, soil and water conservation, irrigation, farm electrification, farm structures and the farmstead. Three hours rec. and three hours lab. a week. Pr.: Math. 100. 506-300-1-0998

506 310. Farm Electrification and Soil Conservation. (2) II. For students pursuing the curriculum in Agricultural Education. Introduction to methods of planning for efficient utilization of electric energy for farm production and to farm surveying including checking of conservation practices applied to soil and water. Six hours lab. a week. 506-310-1-0998

506 324. Tillage-Planting Machinery. (2) I. Primary and secondary tillage machinery, power requirements, field operation, planting equipment, herbicide placement and incorporation, fertilizer application, tillage-planting systems, and cost analysis. Two hours rec. a week. Pr.: Agron. 305 or Agron. 150. 506-324-0-0998

506 325. Crop Harvesting and Handling Systems. (2) II. Hay, forage and crop residue handling systems; machinery components, machinery operation and maintenance, system selection and cost; grain harvesting machinery, fundamentals of operation, adjustment, and maintenance. Two hours rec. a week. 506-325-0-0998

506 330. Agricultural Machinery Management. (3) II. Selection, adjustment, operation, servicing, economics, and application of agricultural machines. Two hours rec. and three hours lab. a week. Pr.: Ag.E. 300 or Phys. 113. 506-330-1-0998

506 351. Farm Power. (3) I, II. A study of small engines and farm tractors; ignition, injection, carburetion, fuels, lubricants, power transmission, control systems, tune-up and maintenance. Two hours rec. and three hours lab. a week. Pr.: Math. 100. 506-351-1-0998

506 352. Agricultural Machinery Construction. (3) I, II. Advanced shop processes and techniques for constructing and maintaining agricultural machinery; advanced welding, metallurgy and selection of materials for construction. One hour rec. and five hours lab. a week. Pr.: Ag.E. 151 and junior standing. 506-352-1-0998

506 353. Farmstead Utilities. (3) I. Utilization of energy for light, heat, and power on the farmstead; planning for distribution of electric power and water; motors and controls. Two hours rec. and three hours lab. a week. Pr.: Math. 100. 506-353-1-0998

Undergraduate And Graduate Credit In Minor Field

506 552. Farm Building Construction. (3) I, II. Construction practices related to buildings and materials used in agriculture; application of procedures for design of concrete mixtures, framing and fastener requirements, material selection; and cost estimation. One hour rec. and five hours lab. a week. Pr.: Math. 100. 506-552-1-0998

506 553. Agricultural Machinery Operation and Maintenance. (3) I, II. Emphasis upon shop skills as applied to machine operation, adjustment, and maintenance principles of power transmission, draft, alignment, timing and calibration of tillage, harvesting, planting, and spraying equipment. One hour rec. and five hours lab. a week. Pr.: Ag.E. 151, Ag.E. 352 and junior standing. 506-553-1-0998

506 554. Planning and Management of Agricultural Buildings. (3) I, II. Concepts and fundamentals required in the planning of livestock production facilities including the evaluation of strength and durability of a structure, planning for an efficient functional layout, and planning for environmental modification needed in animal shelters plus site selection and farmstead planning. Three hours rec. a week. Pr.: Math. 100 and junior standing. 506-554-0-0998

506 555. 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. 506-555-1-0998

506 558. Conservation Surveying and Planning. (3) II. Agricultural surveying; layout and checking waterways, terraces and farm ponds; conservation planning from aerial photographs. One hour rec. and five hours lab. a week. Pr.: Math. 100. 506-558-1-0998

506 559. Agricultural Mechanic Methods. (3) I, II. Methods of teaching agricultural mechanics in high school including the organization and equipment for school shop; preparation of instruction sheets, organization and presentation of demonstrations. One hour rec. and six hours lab. a week. Pr.: Conc. enrollment in student teaching. 506-559-1-0998

506 560. Farm Animal-Waste Management. (3) I. Current practices, technology, 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.: Chem. 110 or 210 and junior standing. 506-560-0-0998

Undergraduate And Graduate Credit

506 615. Problems in Agricultural Mechanization. (Var.) I, II, S. Problems in the application of technical principles to agricultural mechanization. Pr.: Approval of instructor. 506-615-3-0998

506 651. 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. 506-651-1-0998

506 652. Soil and Water Conservation Practices. (3) II. The hydrological cycle; rainfall-runoff relationships; structural conservation practices for conserving water and controlling erosion; drainage of agricultural lands. Two hours rec. and three hours lab. a week. Pr.: Agron. 305, Ag.E. 300 or Ag.E. 558. 506-652-1-0998

506 653. 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 or Agron. 150. 506-653-1-0998

506 654. Agricultural Facilities and Machinery Management. (2) II. 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.: Ag.Ec. 100 and Ag.E. 651. 506-654-1-0998

506 700. Advanced Farm Mechanics. (3) S. For teachers of vocational agriculture and those concerned with teaching agricultural mechanics in high school; advanced shop techniques, with special emphasis on welding, machine tool, mechanical drawing, and farm carpentry. One hour rec. and six hours lab. a week. Pr.: Ag.E. 151, Ag.E. 559 plus one year's teaching experience or approval of instructor. 506-700-1-0998

506 703. Advanced Farm Power. (3) S. For high school teachers of vocational agriculture and others concerned with teaching agricultural mechanics. Tractor operation, service, repair and maintenance plus selection of tractors and power units. Update on small engines, depending on individual need. Develop teaching aids and instructional programs as needed. Two hours rec. and three hours lab. a week. Pr.: Ag.E. 351, Ag.E. 559 plus one year's teaching experience. 506-703-1-0998

Graduate Credit

506 896. 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.: Ag.E. 651 or Ag.E. 653. 506-896-2-0998

506 898. Master's Report. Credit arranged. I, II, S. Topics selected with approval of major professor and department head. 506-898-4-0998

AGRONOMY

(Crops, Soils, Range Management)

B.S. in Agriculture; requires 127 sem. hrs.

H.S. Jacobs, Head of Department*

Professors Bidwell,* Bohannon, Edelblute, Ellis,* Heyne,* Hobbs,* Jacobs,* Kanemasu,* Kissel, Liang,* Mader,* Nilson, Olson,* Paulsen,* Peterson, Pomeranz,* Powers,* Sorensen,* Teare,* Vanderlip,* Wassom.* Whitney,* Wilkins, and Withee;* Associate Professors Barnett,* Dicken, Ehler,* Follett, Kilgore, Lyles,* Nickell,* Nuttleman, Overley, Owensby,* Posler,* Raney, Reinhardt, Russ,* Skidmore,* Stone,* Swallow, and Thlen;* Assistant Professors Armbrust,* Burchett, Claassen, Kingsley, Lundquist, Maddux, Mikesell, Moore, Moshier,* Ohlenbusch, and Walter; Instructors Ball, Dickerson, Hagen, and O'Connor. Emeritus: Professors Anderson,* Axelton, Bleberly, Casady,* Clapp, Cleavinger, Jones,* Lind, Throckmorton,* and Woodruff;* Associate Professors Atkinson and Harper.

Undergraduate Study

Agronomy is the science of crops and soils. It attracts students with interests ranging from soil management to the physics and chemistry of soils and from crop production to the study of photosynthesis, plant physiology and plant breeding.

Students majoring in agronomy are required to complete the following basic courses which are common to the four options that are available. Additional courses are required for the individual options as given below.

		Hrs.
229 100	English Composition I	3
229 120	English Composition II	3
281 105	Oral Communication	2
035 101	Ag Orientation	1
245 100	College Algebra	3
225 110	Economics I	3
015 200	Plant Science	4
	OR	
015 220	Crop Science	4
015 305	Soils	4
221 210	Chemistry I	4
221 230	Chemistry II	4
	Organic Chemistry	3-5
215 198	Principles of Biology	4
030 300	Economic Entomology	3
050 501	Plant Pathology	3
305 260	Fund. of Accounting	4
261 101	Concepts in Phys. Ed.	1
	Humanities and/or Social Sciences (see page 51)	9
	Communications (see page 51)	2 or 3

Courses Required for the Production Option

Genetics	3
Plant Physiology	4
Organic Chemistry	3-5
Biometrics	3
One of the following	3-4
Fund. Ecology	
Microbiology	
Descriptive Meteorology	
Geology	
Prin. Agric. Econ.	3
Prin. Animal Science	3
Plant Pathology	3
Agric. Mechanization*	3-4
Economics or Bus. Admin.*	3

*To be selected from a list on page 50 of the list of departmental courses.

Courses Required for the Business and Industry Option

Prin. Animal Science	3
Business Economics Statistics	3
Trigonometry or Fund. Computer Programming	3
Princ. Agric. Econ.	3
Economics or Bus. Admin.*	12
One of the following	3-4
Fund. Ecology	
Genetics	
Microbiology	

*To be selected from a list on page 50 of the list of departmental courses.

Courses Required for the Communications Option

Fund. Ecology	3
Reporting or Ag. Journalism	3
Editing	3
Communications Courses[1]	9
Biometrics	3
Economics or Bus. Admin.[2]	3
Prin. Animal Science	3

1. To be selected from a list on page 51.
2. To be selected from a list on page 50.

Courses Required for the Science Option

Plant Physiology	4
Genetics or Geology	3
Prin. Agric. Econ.	3
Chemical Anal.	4
Biometrics or Fund. Computer Programming	3
Plane Trigonometry	3
Calculus	4
Gen. Physics I, II	8

Students may also select the soil and water conservation or the range management option of the curriculum in natural resource management (see page 80 or the crop protection curriculum (see page 65).

In addition to the basic courses of Plant or Crop Science and Soils, students are required to take 18 hours of agronomy. These will depend upon the students' interest and career intentions.

Farms, laboratories and greenhouses are used by the Department of Agronomy for both research and instruction.

Graduate Study

Graduate studies leading to Master of Science and Doctor of Philosophy degrees are offered in the fields of crop production, crop physiology, crop ecology, pasture improvement, plant breeding, weed science, plant genetics, soil chemistry, soil fertility, soil physics, soil management, soil-water-plant relations, erosion, irrigation and soil classification.

A prerequisite for advanced degrees is the completion of an undergraduate curriculum substantially similar to that required of undergraduate students majoring in agronomy. This includes not only courses in agronomy but also courses in physical and biological sciences.

Undergraduate Credit

015 150. Plants and Soils for Crop Production. (3) I, II, S. Resources and techniques used to produce crops; soil properties and plant processes basic to understanding cropping practices and systems. For freshmen and sophomores who want an introductory field crop production course. Three hours rec. a week. 015-150-0-0102

015 200. Plant Science. (4) I, II. Study of the principles of the production of economic plants, including morphology, taxonomy, physiology, ecology, propagation, preservation, storage, and utilization. Three hours lec. and one two-hour lab. a week. Taught in cooperation with the Department of Horticulture and Forestry. Not open to students with credit in 015 220. 015-200-1-7-0102

015 220. Crop Science. (4) I, II. Principles underlying practices used in the culture of crops. Application of principles to production management. Plant morphology, crop protection, seed technology. A basic course for majors in agronomy and other undergraduates interested in crop production. Three hours rec. and two hours lab. a week. Not open to students with credit in 015 200 or 040 200. 015-220-1-7-0102

015 240. Weed Management. (3) II. An introductory course for people interested in areas of crop production, crop protection, and agricultural education. Consideration of control systems emphasizing cultural practices and herbicides and legal implications. Includes identification of common mature and seedling weeds. Two hours rec. and one two-hour lab. a week. 015-240-1-7-0102

015 305. Soils. (4) I, II. Fundamental chemical, physical and biological properties of soils; their formation, fertility and management. Two hours lec., one two-hour lab. a week, and self-programmed audiotutorial instruction. Pr.: Chem. 110 or 210 or credit in high school chemistry with grade of A or B. 015-305-1-7-0103

015 340. Market Grading of Cereals. (2) I. Market grades of cereals and factors that influence them. Six hours lab. a week. 015-340-1-0-0102

015 350. Crop and Seed Quality. (2) II. Identification, grading and evaluation of seeds for planting and commercial use. Visual appearance as an indication of quality of seeds, grain crops, hay silage and crop displays. Two two-hour rec. and labs per week. 015-350-1-0-0102

015 360. Forage Crops for Livestock. (3) I. Production and use of forage crops. Forage programs for livestock production including pasture, hay and silage. Two hours rec. and two hours lab. a week. 015-360-1-7-0102

015 365. Soil-Plant Relationships. (3) I. Study of the relationship of chemical and physical properties of soils to plant nutrition; forms of essential elements in soils and their role in plant nutrition; fertilizer materials and application. Three hours rec. a week. Pr.: Agron. 305 and 200 or 220. 015-365-0-0103

015 405. Internship in Agronomy. (1-2) I. Work study programs in various areas of agronomy. One hour credit for each four weeks of supervised and evaluated work experience with cooperating employers. A maximum of two hours may be applied to a B.S. in agronomy. Pr.: Agron. 200 or 220, and 305. 015-405-2-0102

015 415. Soil Morphology. (1) I. Observation, recognition, measurement and recording of soil morphology properties in the field. Six hours of lab. a week for the first half of the semester. Pr.: Agron. 305. 015-415-2-0103

Undergraduate And Graduate Credit In Minor Field

015 500. Range Management I. (3) II. Presents fundamental ecological principles of production, conservation, and utilization of grasslands. Applies these fundamental principles to range management. Three hours rec. a week. 015-500-0-0102

015 505. Soil as a Natural Resource. (3) II. Factors influencing soil development and distribution. Methods of mapping and classifying soils for agriculture and other uses by society; field trips. Two hours rec. and three hours lab. a week. Pr.: Geol. 100 and Agron. 305 or consent of instructor. 015-505-1-6-0103

015 510. Plant Improvement. (3) I. Methods of breeding agricultural crops and evaluation, distribution and maintenance of crop varieties. Three hours rec. a week. Pr.: Agron. 200 or 220. 015-510-0-0102

015 525. Crop and Soil Management. (3) II. Production management of crops and soils in semi-arid, sub-humid and humid areas. Selection of cropping systems and appropriate practices to achieve maximum production and conservation of soil resources. Three hours rec. a week. Pr.: Agron. 200 or 220 and Agron. 305. 015-525-0-0103

015 535. Soil Conservation. (3) I. Principles and practices of water and wind erosion control. Operation of conservation programs. Land-use planning, soil conservation legislation. Two hours rec. and one three-hour lab. a week. Pr.: Agron. 305. 015-535-1-6-0103

015 540. Forage Utilization. (2) I, II. Utilization of forages in livestock production. Consideration of harvest methods, storage and handling, quality and animal use. Two hours rec. per week. Pr.: Junior standing. 015-540-0-0102

Undergraduate And Graduate Credit

015 600. Crop Problems. (Var.) I, II, S. Studies may be chosen in the fields of: Genetics, Crop Improvement, Pasture Improvement, Ecology, Weed Control, Plant Physiology, Production. 015-600-3-0102

015 610. Crop Ecology. (3) II. Study of crop plant growth with relation to genetic, climatic, biotic and soil factors, with special emphasis on the interdependency of these factors. Pr.: Agron. 200 or 220 and 305 or consent of instructor. 015-610-0-0102

015 615. Soil Problems. (Var.) I, II, S. Studies may be chosen in the fields of: Chemistry, Physics, Conservation, Fertility, Genesis, Morphology and Classification. 015-615-3-0103

015 620. Weed Science. (3) I. Principles of weeds and herbicides relating to managerial and chemical weed control. Two hours rec. and one three-hour lab. a week. Pr.: Agron. 200 or 220 and Chem. 190 or equiv. 015-620-1-6-0102

015 625. Management of Irrigated Soils. (2) I. Principles of soil moisture retention, movement and measurement; reclamation and management of saline and alkaline soils; water quality; management. Two hours rec. a week. Pr.: Agron. 200 or 220 and 305. 015-625-0-0103

015 656. Crop Protection Systems. (2) II. Offered in cooperation with entomology and plant pathology. See course description, 050 656. 015-656-0-0102

015 670. Range Management Problems. (Var.) I, II, S. 015-670-3-0102

015 675. Soil Interpretations for Land-use Planning. (3) II. The effect of the physical land resource on land use and land-use planning. Two hours rec. and two hours lab. per week. Pr.: 235 220 or a course in regional and community planning or landscape architectural design or consent of instructor. 015-675-0-0103

015 680. Range Management II. (3) II. Offered 1979-80 and alt. years. Application of principles of plant ecology to management and conservation of natural grazing land and to the characterization and mensuration of range vegetation, with special emphasis on ranges. Two hours rec. a week and one credit of laboratory consisting of field trips to representative range areas. Pr.: Agron. 500, Biol. 530. 015-680-1-6-0102

015 690. Agricultural Climatology. (2) II. 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 or consent of instructor. 015-690-0-0102

015 705. 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. 015-705-0-0103

015 710. Principles of Plant Breeding. (3) I. The application of basic genetic principles for the improvement of plants. Three hours rec. a week. Pr.: A.S.I. 500 or equivalent. 015-710-0-0102

015 715. Herbicide Interactions. (2) 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.: 015 620 and 215 600 or equivalent. 015-715-0-0102

015 725. Soil and Plant Analysis Applications. (3) I. Offered 1979-80 and alt. 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, Chem. 271. 015-725-1-0103

015 735. 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. 200 or 220, 305 and 365 or consent of the instructor. 015-735-0-0103

015 745. Physical Environment of Crops and Soils. (3) II. The properties of crops and soils as affected by their physical environment, including water content, temperature, soil structure and aeration. Two hours rec. and three hours lab. a week. Pr.: Agron. 305. 015-745-1-6-0103

015 755. Soil Fertility. (3) I. Advanced study of the relationship of soil chemistry to plant nutrition; interactions of nutrients and roles of nutrients in plant nutrition; soil reactions to fertilizer materials; diagnosis of soil fertility problems and formulation of recommendations. Three hours rec. a week. Pr.: Agron. 200 or 220, 305 and 365 or consent of instructor. 015-755-0-0103

015 760. 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. 500, Biol. 530. Suitable field experience may be substituted for these prerequisites with consent of instructor. 015-760-2-0102

015 761. Identification of Range and Pasture Plants. (2) II. Offered 1979-80 and alt. 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. 015-761-3-0102

015 770. Plant Genetics. (3) I. Concepts and application of basic genetic principles in higher plants. Measurement of linkage, mapping, aneuploidy analysis, gene transfer, and estimation of genetic parameters for quantitative characters. Three hours rec. a week. Pr.: A.S.I. 500. 015-770-0-0102

015 780. Crop Physiology. (3) II. Principles of nitrogen metabolism, mineral nutrition, photosynthesis, growth substances, and hardiness applied to crop production. Two hours rec. and two hours lab. a week. Pr.: Biol. 600. 015-780-1-6-0102

Graduate Credit

015 805. Mechanics of Soil Erosion and Its Control. (3) I. Offered 1978-79 and alt. years. Techniques for studying erosion. Mechanics of water and wind erosion processes and control practices. Methods of predicting quantities of erosion on agriculture and nonagriculture land. Two hours rec. and three hours lab. a week. Pr.: Agron. 305, Phys. 113. 015-805-1-6-0103

015 810. Agronomy Seminar. (1) I, II. A discussion of agronomic developments. Pr.: Graduate standing. 015-810-0-0102

015 815. Soil-Root Environment. (2) II. 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. 365 and Biol. 600. 015-815-0-0103

015 820. Plant-Water Relations. (2) 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. 200 or 220 and 305. 015-820-0-0102

015 870. Agronomic Plant Breeding. (3) II. Offered in 1979-80 and alt. years. The application of principles and methods of breeding field crops, including laboratory, greenhouse, and field procedures. Two hours rec. and three hours lab. a week. Pr.: Agron. 200 or 220 and 710. 015-870-1-6-0102

015 898. 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. 015-898-4-0102

015 899. 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. 015-899-4-0102

015 905. Soil Physical Chemistry. (3) I. Offered 1978-79 and alt. years. Application of physical chemistry to soils; cation and anion equilibria, cation activities, electrokinetics, sorption and other physiochemical reactions in soils. Two hours rec. and three hours lab. a week. Pr.: Agron. 705, 745 and Chem. 585. 015-905-1-6-0103

015 910. 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 Dept. of Horticulture and Forestry. See 040 910.) 015-910-0-0102

015 915. Soil Physics. (3) I. Offered 1979-80 and alt. years. An advanced study of prominent theories concerning the physical behavior of soils. Three hours rec. a week. Pr.: Agron. 745, Math. 222, Phys. 211. 015-915-0-0103

015 925. Soil Genesis. (2) II. Offered 1978-79 and alt. years. Theories of soil formation processes. Two hours rec. a week. Pr.: Agron. 505. 015-925-0-0103

015 930. 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 Dept. of Horticulture and Forestry. See 040 930.) 015-930-0-0102

015 935. Topics in Soils. (Var.) I, II, S. Discussion and lectures on important papers and contributions in this field. Pr.: Consent of instructor. 015-935-0-0103

015 950. Advanced Crop Ecology. (3) I. Offered 1978-79 and alt. years. Principles of growth and development of crops in relation to the environment. Three hours rec. a week. Pr.: Agron. 610, or equiv., and Biol. 600. 015-950-0-0102

015 960. 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. 015-960-0-0102

015 999. Ph.D. Research. (Var.) I, II, S. Research on a problem which may extend throughout the year and furnish data for a doctoral dissertation. 015-999-4-0102

ANIMAL SCIENCES AND INDUSTRY

B.S. in Agriculture; requires 127 sem. hrs.

Don L. Good, Head of Department*

Professors Adams,* Bartley,* Bassette,* Bonewitz, Brent,* Craig,* Farmer,* Francis, Harbers,* Koch,* Kropf,* McKee, Morrill,* Moyer, Norton,* Richardson,* Sanford,* E. Smith,* Ward,* Wheat,* and Zoellner; Associate Professors Able,* Allee,* Allen,* Ames,* Bolsen,* Call, Corah, Cunningham,* Dikeman,* Dunham, Hines,* Hunt,* M. Jackson, Kastner,* Kiracofe,* Riley,* Schafer, Schalles,* and W. Smith;* Assistant Professors Brazle, Davis,* Hoover,* Marshall,* Michaels, Orwig, Roberts, Schwartz, and Spaeth; Instructors Beat, Buchman, Heisel, W. Jackson, Kahrs, and Mongold. Emeritus: Professors Aubel, Claydon, Cox, Mackintosh, Martin, McAdams, McCormack, and Weber.

Courses in this department give the student instruction in the selection, breeding, feeding, management and marketing of beef cattle, dairy cattle, horses, poultry, sheep, swine and processing of the products produced.

The animal sciences and industry facilities are devoted to the maintenance of herds and flocks of beef cattle, dairy cattle, horses, poultry, sheep, and swine, plus dairy, meat and poultry processing facilities for the purposes of teaching and research.

The department offers to majors in animal sciences and industry options in production, business and industries, science, and communications. Within each option the student may select an area of specialization in animal products, dairy production, meat animals, or poultry. In addition, the department helps administer and advise students enrolled in the curriculum in food science and industry, see page 68.

Graduate Study

Major work 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 and animal nutrition, as well as genetics and food science.

Prerequisite to major graduate work in these fields is the completion of a four-year curriculum substantially equivalent to that required of undergraduate students majoring in animal sciences and industry. This will include not only several courses in the major field, but also sufficient physical and biological science courses to prepare the student for advanced work in the chosen field.

Students majoring in animal sciences and industry take the following general courses:

General Requirements for the B.S. Degree

English Composition I	3
English Composition II	3
Oral Communication	2
Ag Orientation	1
College Algebra	3
Economics I	3
Chemistry I or General Chemistry	4-5
Concepts in Physical Education	1
Humanities and/or Social Sciences (see page 51)	9
Communications (see page 51)	2 or 3
Principles of Animal Science	3
Fundamentals of Nutrition	3

Option requirements are listed on page 50. Faculty advisers assist students in the selection of nonmajor and elective courses.

Meat Animal Specialization

Required

Animal Sciences and Industry	1
Genetics	3
Principles of Feeding	3
Livestock and Meat Evaluation	3
Elements of Meats	2
Animal Breeding	3
Animal Sciences and Industry Seminar	1

Two of the following courses:

Beef Science	3
Swine Science	3
Sheep Science	3
Horse Science	3
Dairy Cattle Management	3
Management of Domesticated Poultry and Gamebirds	3

One of the following courses in the production option:

Environmental Physiology of Farm Animals	3
Reproduction in Farm Animals	4
Patterns in Farm Animal Reproduction	3
Behavior of Domestic Animals	3

Dairy Production Specialization

Required

Dairy Science	1
Dairy Cattle Nutrition	3
Genetics	3
Milk Secretion	3
Dairy Seminar	1

One of the following courses:

Dairy Cattle Breeding	3
Reproduction in Farm Animals	3
Patterns in Farm Animal Reproduction	3

One of the following courses:

Fundamentals of Milk Processing	2
Dairy Bacteriology	4
Principles of Dairy Foods Processing	3

Two of the following courses:

Beef Science	3
Swine Science	3
Sheep Science	3
Horse Science	3
Dairy Cattle Management	3
Management of Domesticated Poultry and Gamebirds	3

Poultry Specialization

Required

Poultry Science	1
Genetics	3
Nutrition of the Fowl	3
Poultry Breeding	3
Avian Metabolism	3
Poultry Products Technology	3
Poultry Judging	3
Poultry Seminar	1

Two of the following courses:

Beef Science	3
Swine Science	3
Sheep Science	3
Horse Science	3
Dairy Cattle Management	3
Management of Domesticated Poultry and Gamebirds	3

Animal Products Specialization

Required

Introductory Food Chemistry	3
Dairy Bacteriology	4
Practical Quality Control of Dairy and Food Products	3

17 hours of the following:

Fundamentals of Food Processing	3
Elements of Meats	2
Meat Processing	2
Livestock and Meat Evaluation	3
Principles of Meat Evaluation	2
Meat Technology	4
Meat-Packing Plant Operation	2
Fundamentals of Milk Processing	2
Fundamentals of Milk Processing Lab	1
Principles of Dairy Foods Processing	3
Principles of Dairy Foods Processing Lab	1-3
Poultry Products Technology	3
Food Products Evaluation	3
Food Plant Management	2

The laboratory of the animal sciences and industry student is the feedlot, the judging pavilion, the dairy barn, the poultry house and the abattoir (as well as the animal nutrition, wool, meats, milk, eggs, genetics and animal breeding laboratories), where animals can be studied from the standpoint of maintenance, growth, reproduction, structure and body composition.

Undergraduate Credit

020 102. 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. (A.S.I. 103, 104, and 105 are companion courses). 020-102-0-0104

020 103. Dairy Science. (1) I, II. Application of basic principles of animal agriculture to dairying. Two hours lab. a week. Pr.: A.S.I. 102 or concurrent enrollment. 020-103-1-0105

020 104. Poultry Science. (1) I, II. Application of basic principles of animal agriculture to the poultry industry. Two hours lab. a week. Pr.: A.S.I. 102 or concurrent enrollment. 020-104-1-0106

020 105. Animal Science 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.: A.S.I. 102 or concurrent enrollment. 020-105-1-0104

020 196. Dairy Cattle Judging. (2) II. Six hours lab. a week. Pr.: A.S.I. 102 and 103. 020-196-1-0105

020 200. Fundamentals of Nutrition. (3) I, II. Elementary principles of comparative nutrition of farm animals. Three hours rec. a week. Pr.: Chem. 110 or 210. 020-200-0-0105

020 250. Elements of Meats. (2) I, II. A survey and discussion of the red meat industry and the product quality, processing, merchandising and promotional trends and techniques. Two hours lec. a week. Pr.: A.S.I. 102 and 105 or consent of instructor. 020-250-0-0104

020 261. Meat Processing. (2) I, II. Converting meat animals into carcasses, and processing techniques for meat products. To include slaughtering, inspection, by-product handling, carcass grading, meat cutting, retail cut identification, preservation, meat cookery, meat specifications, and product control. Three hours lab. and one hour rec. per week. Pr.: A.S.I. 102 and 105, 250 or concurrent assignment. 020-261-1-0104

020 270. Principles of Meat Evaluation. (2) I. Introduction to subjective and objective standards employed in evaluating beef, lamb and pork carcasses and also wholesale cuts. Application of these factors to carcass grade, and yield of edible portion; value and consumer acceptance. Two hours rec. and lab. per week. Pr.: A.S.I. 250, 261, or conc. enrollment (or consent of instructor) and sophomore standing. 020-270-1-0104

020 300. 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 A.S.I. majors. Student cannot apply credit for both A.S.I. 300 and 320 toward a B.S. degree. Pr.: Chem. 110 or equivalent. 020-300-0-0104

020 305. 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. 020-305-0-0104

020 310. Poultry Judging. (3) I. Production characteristics of present breeds and types. Judging standard breeds and varieties by comparison; judging hens for egg and meat production; evaluation of ready-to-cook poultry; and grading of eggs. One hour rec. and six hours lab. a week. Pr.: A.S.I. 102 and 104. 020-310-1-0106

020 311. 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 two hours lab. a week. Pr.: Biochem. 120. 020-311-1-0105

020 315. Livestock and Meat Evaluation. (3) I, II. Evaluation of slaughter livestock and their carcasses as related to economic merit. Evaluation of breeding livestock based on visual appraisal, performance and progeny test records. Modern techniques of livestock and carcass evaluation including ultrasonic sound and tenderometer devices will be demonstrated. One hour lec. and four hours lab a week. Pr.: A.S.I. 102 and 105 or consent of instructor. 020-315-1-0104

020 320. 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.: 020 200 or equivalent. 020-320-1-0104

020 330. Patterns in Farm Animal Reproduction. (3) II. Elementary anatomical and physiological principles as related to the patterns of reproduction in the bovine, equine, porcine, and ovine. Demonstrations of current techniques such as artificial insemination and semen collection and handling are provided in the recitation section. Pr.: A.S.I. 102. 020-330-0-0104

020 385. Wool Grading and Classification. (1) I, II. A study of factors determining the commercial classes and grades of wool and the desired fleece qualities of the breeds of sheep; practice in judging, grading and scoring wool. Three hours lab. a week. Pr.: A.S.I. 102. 020-385-1-0104

020 395. Classification, Grading and Selection of Meats. (1) 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.: A.S.I. 250, 261. 020-395-1-0104

020 402. Fundamentals of Milk Processing. (2) II. Offered 1979 and alt. 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 rec. Pr.: One course in microbiology or consent of instructor. 020-402-1-0105

020 403. Fundamentals of Milk Processing Lab. (1) II. Offered 1979 and alt. years. Laboratories are designed to supplement materials presented in 020 402. Students will study the principles of centrifugals, pasteurizers, homogenizers, fillers and instruments that control processing operations. They will learn the important quality control tests in a dairy plant laboratory. Pr.: 020 402 concurrently. 020-403-1-0105

020 420. Advanced Dairy Cattle Judging. (1) Three hours lab. a week. Pr.: A.S.I. 196. 020-420-1-0105

020 430. Food Products Evaluation. (3) II. Fundamentals of sensory evaluation of dairy, egg, poultry, meat and other agriculture 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.: 035 301 or consent of instructor. 020-430-1-0105

020 450. Principles of Livestock Selection. (2) I. Origin, development, characteristics, and adaptation of different breeds of livestock, with special emphasis on the selection of breeding animals. Four hours lab a week. Pr.: A.S.I. 102, 105 and 315. 020-450-1-0104

020 470. 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.: A.S.I. 450. 020-470-1-0104

Undergraduate And Graduate Credit In Minor Field

020 500. Genetics. (3) I, II, S. Variation, Mendelian inheritance and related subjects. Three hours lec. a week. Pr.: Biol. 198 or 210. 020-500-0-0104

020 501. Principles of Dairy Foods Processing. (3) II. Offered 1979 and alt. 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. Pr.: A course in microbiology, A.S.I. 311 or consent of instructor. 020-501-0-0105

020 505. Principles of Dairy Foods Processing Laboratory. (1-3) II. Offered 1978 and alt. years. Laboratories are integrated with the lecture offered in Principles of Dairy Foods Processing and with outside reading materials. One paper and from five to fifteen laboratory assignments required depending on credit hours enrolled. The paper is to be handled on a tutorial basis and developed from assigned reading. Pr.: A.S.I. 501 or concurrent enrollment. 020-505-0-0105

020 510. Animal Breeding. (3) I, II. Present status of livestock improvement; function of purebred livestock; breeding systems and practices; application of genetics to problems in animal breeding. Pr.: A.S.I. 500. 020-510-0-0104

020 512. Gestation of Farm Animals. (2) I. A detailed study of the gestation of farm animals including management and nutritional factors affecting the physiological events of gestation such as fertilization, ova transport, placenta attachment, growth and parturition of the fetus. The laboratory provides practical training in following the development of the bovine fetus. Pr.: Senior standing and consent of instructor. 020-512-2-0104

020 515. Beef Science. (3) I, II. A comprehensive course covering all phases of the beef cattle industry. Practical application of nutrition, breeding, physiology of reproduction, carcasses, merchandising and related areas. Special emphasis on management systems of raising, growing and finishing beef cattle. Pr.: Senior standing or consent of instructor. 020-515-0-0104

020 521. 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.: A.S.I. 200 or consent of instructor. 020-521-0-0104

020 525. Sheep Science. (3) I. Survey of the sheep and wool industry. Application of scientific principles and research findings to lamb and wool production. Attention given to different production programs. Three hours rec. a week. Pr.: Senior standing or consent of instructor. 020-525-0-0104

020 530. Poultry Breeding. (3) II. Offered 1979 and alt. years. Theoretical and applied methods for improvement of poultry by breeding. Effects of major genes, selection for quantitative traits, genetic correlations, genotype-environmental interactions, inbreeding and heterosis considered. Special techniques of breeding applicable to poultry emphasized. Pr.: A.S.I. 500. 020-530-0-0106

020 535. 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 general overall management of swine production units of varying sizes. Three hours rec. a week. Pr.: Senior standing or consent of instructor. 020-535-0-0104

020 540. Dairy Cattle Breeding. (3) II. Introduction and application of quantitative genetic principles of the improvement of economically important traits in dairy cattle with emphasis upon selection, variation, heritability estimates, breeding systems and estimates of breeding value of sires and dams through pedigree analysis. Two hours rec. and three hours lab. a week. Pr.: One semester each of elementary genetics and statistics. 020-637-1-0105

020 550. Dairy Bacteriology. (4) II. Offered 1979 and alt. years. 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 per week. Pr.: Biochem. 120 or equiv. 020-550-1-0105

020 555. 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. 020-555-0-0106

020 580. Animal Science and Industry Seminar. (1) II. Open only to senior students majoring in animal sciences and industry. One hour rec. a week. 020-580-0-0104

020 581. Dairy Seminar. (1) II. Study of dairy periodicals, bulletins, books, other dairy literature. One hour rec. a week. Pr.: Junior standing in dairy production. 020-500-0-0105

Undergraduate And Graduate Credit

020 601. Milk Secretion. (3) II. Offered 1979 and alt. years. Anatomy and histology of mammary gland. Physiology of lactation, milk constituents and management practices that alter qualitative and quantitative aspects. Contemporary milking practices and mastitis control. Two hours lec. and two hours lab. a week. Pr.: Junior standing or consent of instructor. 020-601-1-0105

020 605. Commercial Cattle Feedlot Management. (3) S. Principles of commercial cattle feedlot management including cattle management, animal health, feed yard maintenance, feed mill operation, office management, and animal evaluation. A maximum of two hours credit for each four weeks of supervised work-study at an approved commercial cattle feedlot. Pr.: A.S.I. 515. 020-605-2-0104

020 610. Dairy Cattle Nutrition. (3) I. Application of principles of nutrition to feeding of dairy cattle; exercises in practical feeding problems; designing and balancing rations. Two hours lec. and two hours lab. a week. Pr.: A.S.I. 200. 020-610-1-0105

020 615. Swine Production Unit Operation. (3) S. A maximum of two hours credit for each four weeks of supervised work-study at an approved commercial swine production unit. Pr.: A.S.I. 535. 020-615-2-0104

020 620. Livestock Production and Management. (2) I, II. Student involvement in laboratory exercises related to practical livestock production and management principles for beef, horse, sheep, or swine. Four to six hours lab a week. Pr.: Appropriate A.S.I. course (515, 521, 525, or 535) and consent of instructor for specific area. 020-640-2-0104

020 621. Dairy Cattle Management. (3) II. Offered 1978 and alt. years. 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. Three hours rec. a week. Pr.: A.S.I. 102 and 103 and junior standing. 020-621-1-0105

020 625. Beef Cow Herd Unit Operation. (3) S. Principles of management in a beef cow unit involving direct contact in physiology, reproduction, breeding programs, nutrition, ranch accounting and other management procedures. Maximum of four total credits. Pr.: A.S.I. 515 or consent of instructor. 020-625-2-0104

020 640. Management of Domesticated Poultry and Game Birds. (3) II. Offered 1979 and alt. years. A detailed study of the production and management practices involved in commercial poultry and game bird enterprises. Two hours rec. and three hours lab. a week. Pr.: A.S.I. 102 and 104, senior or graduate standing. 020-640-1-0106

020 661. Animal Sciences and Industry Problems. (1-3) I, II, S. Pr.: Consent of instructor. 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. 020-661-3-0104

020 671. Meat Selection and Utilization. (3) I. Emphasis on meat cut identification, muscle and bone anatomy, grades, fabricated meat, institutional cuts, specification writing, processing, meat preparation and shrinkage costs. Two-hour period weekly of lecture-recitation and two hours laboratory. Pr.: 640 400 or 640 601 or 660 440. 020-671-1-0104

020 690. Practical Quality Control of Dairy and 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. One hour rec. and five hours lab. a week. Pr.: One course in bacteriology. 020-690-1-0105

020 694. Food Plant Management. (2) II. 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. Not open to business option students—food science and industry. Pr.: Junior standing or consent of instructor. 020-694-0-0105

020 700. Animal Nutrition. (3) I. Intended for graduate-level course in animal nutrition. An in-depth study of digestion, absorption, and metabolism in both monogastric and ruminant species. Three hours rec. per week. Pr.: Biochemistry 521 or equiv. 020-700-0-0104

020 705. Reproduction in Farm Animals. (4) I. Introduction to anatomical and physiological aspects of reproduction in farm animals. Laboratories provide orientation and participation in techniques and procedures in artificial breeding. Pr.: A.S.I. 102 or equiv. and junior standing. 020-705-1-0105

020 710. Poultry Products Technology. (3) I. Offered 1979 and alt. years. Emphasis on the technological problems that exist between producer and consumer in the production and distribution of poultry and eggs. Poultry processing, tenderness, shelf-life and packaging. Egg grading, preservation, chemical changes, problems, and egg products. Two hours rec. and three hours lab. a week. Pr.: A.S.I. 102, 104; Biochem. 200, or consent of instructor. 020-700-1-0106

020 712. Nutrition of the Fowl. (3) II. Designed for advanced students. The nutritive requirements of the fowl are considered together with metabolism of nutrients, digestion, and excretion. Poultry feeds, the compilation of rations, and feeding practices are discussed. Three hours rec. a week. Pr.: A.S.I. 102 and 104. 020-712-1-0106

020 715. 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.: Biochem. 521, 522. 020-715-0-0105

020 720. Avian Metabolism. (3) I. Offered 1978 and alt. years. Special emphasis on the physiological processes in reproduction, digestion, absorption, circulation, respiration, excretion and internal secretions. Three hours rec. a week. Pr.: A.S.I. 102 and 104. 020-720-0-0106

020 725. Meat-Packing Plant Operation. (2-6) S. A minimum of two weeks intensive study, or six weeks work study in a commercial meat plant for each two credits. Exposure to procurement, selection and grading, slaughter, processing/fabrication, quality control, by-products, accounting and mechanical/maintenance areas of a meat plant. Prior arrangements must be made. Pr.: A.S.I 250 and senior or graduate standing. 020-725-2-0104

020 735. 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. per week with frequent laboratory demonstrations. Pr.: Physiol. 530 or consent of instructor. 020-735-0-0104

020 743. Advanced Animal Breeding. (4) II. Application of genetic principles to livestock improvement, selection methods, mating systems, heritability estimates and methods of analyzing genetic data. Three hours lec. and one hour rec. a week. Pr.: A.S.I. 500 and three hours in statistics. 020-743-0-0104

020 750. Poultry Seminar. (1) I. Required of all students majoring in poultry science. Also required of graduate students. One hour rec. or conference a week. Pr.: A.S.I. 102 and 104. 020-750-0-0106

020 777. 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.: A.S.I. 250 and 261; senior or graduate standing. 020-777-1-0104

Graduate Credit

020 810. Graduate Seminar in Dairy Science. (1) I, II. A study of current literature in the field of dairy science. One hour rec. a week. 020-810-0-0105

020 818. Fundamentals of Meat Processing and Preparation. (1-2) S. Inspection, grading, processing, and preparation in relation to chemical and physical characteristics, cost, safety, quality and palatability of red meat. Pr.: 640 601 or equivalent and concurrent enrollment in 640 818. 020-818-1-0104

020 820. Rumen Metabolism. (3) II. 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 recitations a week. Pr.: A.S.I. 200; Biochem. 521 or 655, or consent of instructor. 020-820-1-0105

020 836. Experimental Techniques in Animal Reproduction. (3) II. Offered 1979 and alt. years. Study of experimental techniques used in animal reproduction. Current literature studies and laboratory experiments. Pr.: Background in anatomy and physiology or consent of instructor. 020-836-1-0104

020 850. Analytical Techniques in Animal Sciences and Industry. (3) I, II. Principles of analytical procedures used in research in animal sciences and industries. One hour rec. and six hours lab. a week. Pr.: Consent of instructor. 020-850-1-0104

020 886. Comparative Animal Nutrition. (5) I. A study of the veterinary medical aspects of nutrition, including principles of feeding and nutrition of common domestic species of food-producing and companion animals; consideration of material relative to therapeutic nutrition as related to clinical management of diseased and convalescent animals. Pr.: Third year Veterinary Medicine or A.S.I. 020 700. 020-886-0-0104

020 890. 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 two hours may be applied toward an advanced degree. 020-890-0104

020 898. Master's Report. (2) I, II, S. Pr.: Consult major professor. 020-898-4-0104

020 899. Master's Research in Animal Sciences and Industry. (Var.) I, II, S. Pr.: Consult instructor. 020-899-4-0104

020 900. Topics in Ruminant Nutrition. (2) II. Offered in 1978 and alt. 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.: A.S.I. 700, 820. 020-900-0-0104

020 901. Topics in Monogastric Nutrition. (2) I. Offered in 1979 and alt. 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.: A.S.I. 700 or equivalent. 020-901-0-0104

020 905. Lipids in Food Systems. (2) S. Offered 1979 and alt. years. Processing, analysis and physical and chemical characteristics of lipids with emphasis on their behavior and function in food systems. One hour rec. and three hours lab. a week. Pr.: Biochem. 521 and F&N 601 or A.S.I. 715. 020-905-0-0105

020 906. Animal Breeding Seminar. (1) II. Evaluation of animal experimentation as related to reproduction and breeding. Pr.: Consent of instructor. 020-906-0-0104

020 930. Advanced Meat Science. (3) I. (Offered in fall on 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.: A.S.I. 777 or equivalent and Biochem. or consent of instructor. 020-930-0-0104

020 999. Doctoral Research in Animal Sciences and Industry. (Var.) I, II, S. Pr.: Consult instructor. 020-999-4-0104

CROP PROTECTION

B.S. in Agriculture; requires 127 sem. hrs.

Advisers: Dickerson, Plant Pathology; Ehler, Agronomy; Miles, Horticulture; Poston, Entomology; Schwenk, Plant Pathology.

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, produce nutritious food and good fiber while avoiding adverse effects on man, wildlife and the environment. Those who are trained in crop protection monitor the environment and supervise environmental monitors, become agricultural extension agents, pest management supervisors, technical sales representatives, research assistants, retail salesmen, regulatory specialists, research specialists and private practitioners.

The crop protection curriculum is administered by a committee of faculty from the departments of Agronomy, Entomology, Horticulture and Forestry, and Plant Pathology. Persons interested in the curriculum should contact the Dean's Office, College of Agriculture, for additional information and assignment of an adviser. It offers options as discussed below.

The pest management option is designed to prepare a student to 1) recognize and analyze factors that cause pest problems, 2) prescribe an economical control that does not violate state or federal regulations and that has minimal adverse effects on the environment, 3) advise on control programs, including ecologically sound preventative measures and 4) 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. (See page 66 for the entomology science option and page 81 for the plant pathology science option.)

Students majoring in crop protection are required to complete the following basic courses.

General Requirements

229 100	English Composition I	3
229 120	English Composition II	3
281 105	Oral Communication	2
035 101	Agricultural Orientation	1
245 100	College Algebra	3
221 210	Chemistry I or 221 110 Gen. Chem.	4-5
289 250	Agricultural Journalism (or equiv. communications course)	3
225 110	Economics I	3
261 101	Concepts in Physical Education	1
	Humanities and Social Sciences (See page 51)	9

Other requirements depend upon the option selected.

1. Pest Management Option

Curriculum Requirements

015 240	Weed Management	3
030 312	General Entomology	2
030 314	Insect and Arachnid Identification	3
030 420	Insecticides: Properties and Laws	2
030 612	Insect Pest Diagnosis	2
030 667	Insect Pest Management	3
030 670	Insect Pests of Field Crops, Grasslands, & Livestock	2
	OR	
030 680	Insect Pests of Horticulture Crops & Forests	2
040 682	Plant Protection	3
050 510	Principles of Horticultural Plant Pathology	3
050 520	Principles of Field Crop Pathology	3
050 609	Plant Disease Diagnosis	3
050 612	Plant Disease Control	2
050 651	Internship in Crop Protection	1-2
050 701	Seminar in Crop Protection	1

Supporting Courses—Agriculture and Biological Sciences

015 200	Plant Science	4
	OR	
015 305	Soils	4
015 220	Crop Science	4
215 198	Principles of Biology	4
215 201	Organismic Biology	5
215 529	Fundamentals of Ecology	3

Four or more of the following suggested

015 500	Range Management	3
015 505	Soil as a Natural Resource	3
015 525	Crop and Soil Management	3
015 610	Crop Ecology	3
015 625	Management of Irrigated Soils	3
020 102	Principles of Animal Science	3
020 200	Fundamentals of Nutrition	3
020 500	Genetics	3
030 745	Insect Control by Host Plant Resistance	2
040 520	Fruit Production	3
040 560	Vegetable Crop Ecology	3
040 575	Nursery Management	3
040 612	Turf Management	3
506 653	Irrigation Practices	3

Supporting Courses—Physical Sciences and Mathematics

265 113	General Physics I or 265 115 Descriptive Physics	4
221 190	Elementary Organic Chemistry	
221 191	Lab.	5
211 201	Elementary Biochemistry	
211 202	Lab.	5
285 340	Biometrics I	3

2. 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—Biological Sciences

015 200	Plant Science	4
	OR	
015 220	Crop Science	4
015 305	Soils	4
	OR	
015 365	Soil Plant Relationship	4
215 198	Principles of Biology	4
215 529	Fundamentals of Ecology	3

Two or more of the following suggested

015 500	Range Management	3
015 505	Soil as a Natural Resources	3
015 525	Crop and Soil Management	3
015 610	Crop Ecology	3
015 625	Management of Irrigate Soils	3
020 102	Principles of Animal Science	3
020 200	Fundamentals pf Nutrition	3
020 500	Genetics	3
030 745	Insect Control by Host Plant Resistance	2
040 520	Fruit Production	3
040 560	Vegetable Crop Ecology	3
040 575	Nursery Management	3
040 612	Turf Management	3
506 653	Irrigation Practices	3

Supporting Courses—Physical Sciences and Mathematics

285 340	Biometrics I or 010 480 Agricultural Economics Statistics	3
265 113	General Physics I or 265 115 Descriptive Physics	4
211 120	Intro. Organic and Biol. Chemistry	5

Supporting Courses—Business Administration and Economics

305 260	Fundamentals of Accounting	3

Four or more of the following suggested

305 202	Small Business Operations	3
305 370	Managerial and Cost Controls	3
305 390	Business Law I	3
305 420	Management Concepts	3
305 440	Marketing	3
305 542	Sales Management	3
225 530	Money and Banking	3
225 620	Labor Economics	3
225 631	Principles of Transportation	3
010 518	Economic Principles of Agricultural Business Firms	3

All other courses in Ag. Econ. with a 500 or higher course number.

ENTOMOLOGY

B.S. in Agriculture under the Crop Protection curriculum (see page 65) which includes the entomology science option.

Richard J. Sauer, Head of Department*

Professors Blocker,* Brooks, Elzinga,* Gates, Harvey,* Hopkins,* Horber,* Knutson,* Mills,* Pitts,* and Sauer;* Associate Professors Cress,* Hatchett,* Kadoum,* Mock,* H. Thompson,* and Wilde;* Assistant Professors Boles,* DePew, McGaughey,* Poston,* Ramoska,* L. Thompson,* and Welch.* Emeritus: Professors Wilbur* and Smith;* Assistant Professor Eshbaugh.

Entomology is the study of insects and their near relatives. Applied entomology stresses their relations to plants and animals, including man. Courses fall into two groups: (1) broad, general courses suitable for any student and (2) 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. Courses 300 or 312 and 313 or 314 and at least five additional entomology credits such as 305, 325 and 326 are recommended.

Undergraduate Study

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 (page 65).

Students particularly interested in insects as a subject of special study, including insects in relation to plants, man 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 (page 65), the following:

Entomology Courses

030 312	General Entomology	2
030 313	General Entomology Lab.	1

030 660	External Insect Morphology	3
030 710	Insect Taxonomy	3
030 667	Insect Pest Management	2
030 670	Insect Pests of Field Crops, Grasslands, and Livestock	2
030 680	Insect Pests of Horticultural Crops and Forests	2

Other Agriculture and Biology Courses

020 500	Genetics	3
215 19B	Principles of Biology	4
215 201	Organismic Biology	5
215 555	Microbiology	5
215 529	Fundamentals of Ecology	3
	OR	
215 631	Ecology	3
	Approved Electives	20

Physical Sciences and Mathematics

221 230	Chemistry II	4
245 150	Plane Trigonometry	3
2B5 340	Biometrics I	3
One of the following:		
221 190	Elementary Organic Chem. and	3
221 191	Elementary Organic Chem. Lab.	2
	OR	
221 531	Organic Chemistry I and	3
221 532	Organic Chemistry Lab.	2
	OR	
221 350	General Organic Chem. and	3
221 351	General Organic Chem. Lab.	2
One of the following:		
211 510	General Plant Biochemistry	4
	OR	
221 521	General Biochemistry and	3
211 522	General Biochemistry Lab.	2
	OR	
211 201	Elementary Biochemistry and	3
211 202	Elementary Biochemistry Lab.	2
One of the following:		
245 220	Analytical Geom. and Calc. I	4
	OR	
2B6 200	Fundamentals of Computer Programming and	2
2B6 201	FORTRAN Language Laboratory	1
One of the following:		
265 113	General Physics I and	4
265 114	General Physics II	4
	OR	
265 115	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 or the biological and physical sciences are needed to provide a satisfactory foundation for graduate work. Facilities for research include field insectaries, greenhouses, programmed environmental chambers, several temperature and humidity-controlled rooms for rearing insects, laboratories for use of radioisotopes and a scanning electron microscope.

Major laboratories are provided for study of insect behavior; host plant resistance to insects; taxonomy; toxicology; physiology; biochemistry; for biology, ecology and control of insects attacking man, animals, and stored products; and isolated laboratories for insecticide testing and for chemical and bioassay determination of insecticide residues. Facilities for the investigation of the biology and control of insects attacking trees, shrubs and ornamental plants, fruits and vegetables, 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 selected on-campus departments further enhances graduate studies.

Undergraduate Credit

030 300. Economic Entomology. (3) I, 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. 030-300-1-0421

030 305. Livestock Entomology. (2) I, II. 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, as well as general agriculture. Two hours lecture-demonstration a week. 030-305-0-0421

030 312. 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. 030-312-0-0421

030 313. General Entomology Laboratory. (1) I, II. Identification, food preferences, and habitat preferences of the common insects. Two hours a week. 030-313-0-0421

030 314. Insect and Arachnid Identification. (3) I. Pr.: 030 312 or concurrent enrollment. (Not open to Entomology Science option majors in crop protection curriculum.) Identification of common insects and arachnids. Two three-hour labs a week. 030-314-1-0421

030 325. Insects of Home, Lawn and Garden. (2) I, II. An Introduction to entomology with special reference to insects and other pests of home, lawn and garden. Various methods of control, including non-chemical methods of keeping pest problems to a minimum. Primarily intended for students in horticulture and non-agriculture majors. Two hours lecture-demonstration a week. 030-325-0-0421

030 326. Insects of Home, Lawn and Garden Laboratory. (1) I, II. Laboratory exercises for recognition and control of many horticultural and household pests both for the home owner and advisers of home owners. Pr.: 030 325 or concurrent enrollment. Two hours lab. a week. 030-326-1-0421

030 420. Insecticides: Properties and Laws. (2) II. Pr.: 221 190. Study of chemical and biological properties of Insecticides. Formulations, use, safety and environmental impact as related to agriculture. Legal aspects of pesticides will be considered, especially those pertaining to use and misuse of insecticides. Two hours lec. a week. 030-420-0-0421

Undergraduate And Graduate Credit

030 612. Insect Pest Diagnosis. (2) I. Pr.: 030 314 or 030 710. 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. 030-612-1-0412

030 625. Biological Control of Insects. (3) II. Pr.: Two courses in biological science. The principles and philosophy of biological control with a major emphasis on the control of insects. Two hours lec. and one hour discussion a week. 030-625-0-0421

030 660. External Insect Morphology. (3) I. 1978-79 and alt. years or on demand. 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. 030-660-1-0421

030 667. Insect Pest Management. (2) I. Pr.: 030 300 or 030 312. A presentation of the items necessary to consider in order to develop a sound pest management program, beginning with identification of a problem to recommendations made at the grower level to deal with the pest. Two hours lec. a week. 030-667-0-0412

030 670. Insect Pests of Field Crops, Grasslands and Livestock. (2) I. Pr.: 030 667 or concurrent enrollment. The major and minor pests attacking field crops, livestock, stored grain and grasslands. Two two-hour labs. a week. 030-670-1-0412

030 680. Insect Pests of Horticultural Crops and Forests. (2) I. Pr.: 030 667 or concurrent enrollment. Familiarization with appearance, life history and behavior of representative insect pests of fruits, vegtables, turf, ornamental plants, shade trees and forests. Special attention given to problems in crop protection. Two two-hour labs. a week. 030-680-0-0421

030 705. Insects of Stored Products. (3) II. Biology, ecology and behavior of stored-product insects and current practices involved in their control. Pr.: Entom. 300, or 312 and 313, or consent of instructor. Two hours lec. and three hours lab. a week. 030-705-1-0421

030 710. Insect Taxonomy. (3) II. 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. 660 recommended but not required; insect collection desirable. 030-710-1-0421

030 721. Medical Entomology. (2) I. Insects and other arthropods as parasites and disseminators of disease; life cycles, biology, and control of insect parasites of man and animals. Pr.: Entom. 300 or 312 and 313. 030-721-0-0421

030 722. Medical Entomology Lab. (1) I. Identification of arthropod pests and vectors, and current diagnostics in medical entomology. Pr.: Entom. 300 or 312 and 313. 030-722-1-0421

030 730. Topics in General and Systematic Entomology. (Var.) I, II. Offered 1979-80 and alt. years. Principles of taxonomy; advanced taxonomy; taxonomy of immature insects; arachnology; and biological literature. Pr.: Entom. 300 or 312 and 313 and consent of instructor. 030-730-1-0421

030 745. Insect Control by Host Plant Resistance. (2) I. Offered 1978-79 and alt. 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. 030-745-0-0421

030 757. Toxicology and Properties of Insecticides. (3) I. Physical, chemical and biological properties of insecticides; demonstrations in the laboratory of symptoms and antidote actions in mammals; formulations and residue analysis. Two hours lec. and two hours lab. a week. Pr.: 221 350, General Organic Chemistry, or consent of instructor. 030-757-1-0421

030 765. Internal Insect Morphology. (3) II. Offered 1978-79 and alt. years. Internal anatomy of representative insects; plan and structure of internal systems. One hour lec. and six hours lab. a week. Pr.: Entom. 660. 030-765-1-0421

030 775. Insect Physiology. (3) I. Offered 1979-80 and alt. years. Processes of growth, maturation and reproduction; sensory perception, nervous and hormonal control systems, locomotion, biorhythms and diapause; nutritional requirements, digestion, circulation, respiration, water regulation and excretion. Two hours lec. and three hours lab. a week. Pr.: Entom. 765 or consent of instructor. 030-775-1-0421

030 785. Insect Pathology. (3) I. Offered 1979-80 and alt. years. A study of infectious and non-infectious diseases of insects. Emphasis on identification and diagnosis of major insect diseases. Commercial status of various pathogens and federal regulations concerning insect pathogenic microorganisms are discussed. Pr.: Biol. 555 and Entom. 312 and 313. Two hours lec. and two hours lab. a week. 030-785-1-0421

030 790. Insect Ecology and Population Management. (3) I. Offered 1978-79 and alt. years. Insect populations in natural ecosystems and agroecosystems; bioclimatic factors affecting population size and distribution; concepts of natural regulation and balance; population analysis and bioeconomics; concepts of population management. Two hours lec. and three hours lab. a week. Pr.: Stat. 720 or concurrent enrollment. 030-790-1-0421

030 795. Entomology Seminar. (1) I, II, S. Pr.: Consult seminar committee. 030-795-0-0421

030 799. Problems in Entomology. (Var.) I, II, S. For nonthesis or non-dissertation studies. Work in various fields of entomology. Pr.: Consent of instructor. 030-799-3-0421

Graduate Credit

030 898. Report in Entomology (M.S.). (Var.) I, II, S. Work in various fields of entomology. Pr.: Consent of instructor. 030-898-4-0421

030 899. Research in Entomology (M.S.). (Var.) I, II, S. For students majoring in entomology. Pr.: Knowledge in special area and consent of instructor. 030-899-4-0421

030 930. Topics in Environmental and Physiological Entomology. (Var.) II. Selected topics for advanced study in insect behavior, ecology, physiology and pesticides in the environment. Pr.: Consent of instructor. 030-930-3-0421

030 999. Research in Entomology. (Var.) I, II, S. Dissertation credit for students majoring in entomology. Pr.: Knowledge in special area and consent of instructor. 030-999-4-0421

FOOD SCIENCE AND INDUSTRY

B.S. in Food Science and Industry, requires 127 sem. hrs.

Advisers: Cunningham, Kropf, Bassette, Hunt, Kastner, and Marshall, Animal Sciences and Industry; Seib, Grain Science and Industry; Greig, Horticulture.

This curriculum leads toward careers in the food industry. In addition to the general education provided, the student gains attitudes, knowledge and skills essential for an understanding of the principles of food science. It 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 each student to tailor his or her education to fit personal career goals.

Employment opportunities include production management, product and process research and development, public health and regulatory agency service, teaching, merchandising, advertising, technical service and sales, quality control supervision and positions in international food agencies.

Students will select one of three options: processing, business, or science. This is an interdepartmental curriculum involving the departments of Animal Sciences and Industry, Grain Science and Industry, and Horticulture. The science option involves the Department of Foods and Nutrition in the College of Home Economics and the departments of Animal Sciences and Industry, Grain Science and Industry, and Horticulture in the College of Agriculture. Students may enroll in either college for the science option of this curriculum, depending upon their interest. See College of Home Economics, page 270.

Facilities range from those required for fundamental studies to pilot plant production and utilization of dairy, poultry, red meat, horticultural and grain-based foods. Students should contact the office of the Dean of Agriculture or the Dean of Home Economics for assignment of an adviser.

Core Curriculum—Processing and Business Options

Freshman (20-21 hrs.)

229 100	English Composition I	3
229 120	English Composition II	3
281 105	Oral Communication I	2
or 106	Oral Communication 1A	3
035 101	Ag. Orientation	1
245 100	College Algebra	3
225 110	Economics I	3
221 210*	Chemistry I	4
261 101	Concepts in Physical Education	1

Agriculture (12-14 hrs.)

035 301	Intro. Food Science & Technology	3
020 200	Fundamentals of Nutrition	3

Plus any 2 of the following:

015 200	Plant Science	4
020 102	Principles of Animal Science	3
	AND	
020 102	Principles of Animal Science	3
	OR	
020 103	Dairy Science	1
	OR	
020 104	Poultry	1
020 105	Animal Sciences & Industry	1
030 300	Economic Entomology	3
045 100	Principles of Milling	3
010 100	Principles of Agric. Economics	3

Food Science (16-17 hrs.)

020 550	Dairy Bacteriology	4
	OR	
215 555	Microbiology	4
045 651	Food and Feed Plant Sanitation	4
	OR	
020 690	Practical Quality Control of Dairy & Food Products	3
010 514	Economics of Food Marketing	3
020 311	Introductory Food Chemistry	3
020 305	Fundamentals of Food Processing	3
	Course also numbered 025 305 and 045 305.)	

Biological Sciences (8-9 hrs.)

215 198	Principles of Biology	4

Plus one of the following:

215 201	Organismic Biology	5
740 530	Anatomy & Physiology	4

Physical Sciences (13-16 hrs.)**

221 230	Chemistry II	4
	(Not required it 221 271 Chemical Analysis is taken)	
211 120	Introductory Organic and Biological Chemistry	5
	OR	
221	Organic Chemistry Elective	3
	AND	
211 201	Elementary Biochemistry	5
	OR	
211 521	General Biochemistry	3
211 522	General Biochemistry Lab.	2
	Note: 211 521 and 211 522 may be substituted for Elementary Biochemistry.	
265 113	General Physics I	4
	OR	
265 115	Descriptive Physics	4

Mathematics (6-7 hrs.)

Any two courses from the following:

245 150	Plane Trigonometry	3
245 220	Analytic Geom. & Calc. I	4
	OR	
245 500	Intro. to Anal. Proc.	3
286 200	Fundamentals of Computer Prog.	3
285 320	Elements of Statistics	3
	OR	
285 340	Biometrics I	3
	OR	
285 703	Statistical Methods for Natural Scientists	3

Social Sciences/Humanities (9 hrs.)

Communications (2-3 hrs.)

From College of Agriculture list of suggested Communications courses.

TOTAL CORE CURRICULUM: 86-96 hours

MINIMUM

	Processing	Business
Core courses	86	83
Options	24	27
Electives	17	17
	127	127

*221 110 General Chemistry (5) must be taken by those electing the business option plus 9 hours minimum from the physical sciences.

**9 credits minimum for business option.

1. Processing Option

A minimum of 18 hours from the following courses plus 6* hours in other options.

020 250	Elements of Meats	2
	AND	
020 261	Meat Processing	2
020 720	Meat-Packing Plant Operations	2-6
020 402	Fundamentals of Milk Processing	2
020 403	Fundamentals of Milk Processing Laboratory	2
020 777	Meat Technology	4
020 501	Principles of Dairy Foods Processing	3
020 505	Principles of Dairy Foods Proc. Lab.	1-3
020 700	Poultry Products Technology	3
040 792	Handling and Processing Fruits and Vegetables	3
045 120	Introductory Bakery Technology	2
045 635	Baking Science I	2
045 636	Baking Science I Lab.	2
045 637	Baking Science II	2
045 638	Baking Science II Lab.	1
045 715	Fund. of Processing Grains for Food	3
215 520	Microbiology of Foods	4
640 601	Food Science	4
640 612	Principles of Food Product Development and Control	3

2. Business Option

A minimum of 18 hours from the following courses which must include 305 260 and 305 270, plus 9 hours from processing option.

010 518	Econ. Principles of Business Firms	3
010 520	Grain Marketing	3
010 521	Livestock and Meat Marketing	3
225 120	Economics II	3
305 260	Fundamentals of Accounting	3
305 270	Managerial and Cost Controls	3
305 271	Cost Accounting	3
305 292	Business Law I	3
305 392	Business Law II	3
305 420	Management Concepts	3
305 421	Production Management	3
305 440	Marketing	3
305 450	Business Finance	3
305 531	Personnel and Wage Administration	3
305 530	Labor Legislation	3
305 540	Consumer Behavior	3
305 541	Retailing	3
305 542	Sales Management	3

3. Science Option—Joint Program of Colleges of Agriculture and Home Economics

Liberal-General (23 hours)

229 100	English Composition I	3
229 120	English Composition II	3
281 105	Oral Communication I	2
245 100	College Algebra	3
225 110	Economics I	3
	Electives in Social Science or Humanities	9

Biological Science (8 hours)

215 198	Principles of Biology	4
215 555	Microbiology	4

Agriculture or Home Economics Core
(Choose either A or B.)

A. Agriculture (4-7 hours)

035 101	Ag Orientation	1

Plus any of the following

015 200	Plant Science	4
020 102	Principles of Animal Science	1
	OR	
020 103	Dairy Science	1
	OR	
020 104	Poultry Science	1

020	105	Animals Sciences & Industry	1
045	100	Principles of Milling	3

B. Home Economics (5-7 hours) See page 291.

Physical Sciences (37 hours)

221	210	Chemistry I	4
221	230	Chemistry II	4
221	271	Chemical Analysis	4
221	350	Gen. Org. Chemistry	3
221	351	Gen. Org. Chemistry Lab.	2
211	521	Gen. Biochemistry	3
211	522	Gen. Biochemistry Lab.	2
265	113	Gen. Physics I	4
265	114	Gen. Physics II	4
245	150	Plane Trig.	3
245	220	Anal. Geom. & Calc. I	4

Professional Courses (23-24 hrs.)

035	301	Intro. Food Science & Technology	3
640	602	Principles of Nutrition	3
215	520	Microbiology of Foods	4
640	601	Food Science	4
020	311	Introductory Food Chemistry	3
020	305	Fundamentals of Food Processing (Course also numbered 025 305 & 045 305.)	3
045	651	Food and Feed Plant Sanitation	4
		OR	
020	690	Practical Quality Control of Dairy & Food Products	3

Professional Elective: Total 14-17 hrs. including (5-8 hrs.) of the following

020	250	Elements of Meats	2
		AND	
020	261	Meat Processing	2
020	777	Meat Technology	4
020	720	Meat-Packing Plant Operation	2-6
020	402	Fundamentals	2
020	403	Fundamentals of Milk Processing Laboratory	1
045	715	Fund. of Processing Grains for Food	3
020	501	Principles of Dairy Foods Processing	3
020	505	Principles of Dairy Foods Processing Lab.	1-3
020	700	Poultry Products Technology	3
040	792	Handling and Processing Fruits and Vegetables	3
045	120	Intro. Bakery Technology	2
045	635	Baking Science I	2
045	636	Baking Science I Lab.	2

Plus minimum 9 hours of the following

010	514	Economics of Food Marketing	3
020	550	Dairy Bacteriology	4
020	715	Chemistry of Foods	3
045	300	Cereal and Feed Analysis	3
045	602	Cereal Science	3
045	661	Qualities of Feed & Food Ingredients	3
045	700	Adv. Cereal Chem.	3
045	711	Prin. of Food Analysis	3
215	201	Organismic Biol.	5
215	525	Human Physiology	4
2B5	340	Biometrics I	3
2B6	200	Fund. of Computer Programming	3
640	301	Trends in Food Products	3
640	760	Fund. of Food Flavor Analysis	3
640	710	Nutr. Needs Throughout Life Cycle	3
640	790	Food Res. Techniques	3
740	530	Anat. & Physiology	4

Unrestricted Electives (10-17 hrs.)

Summary of Course Areas & Hours (Science Option)

Liberal-General	23
Biological Sci.	B
Agriculture or Home Economics Core	4-7
Physical Sciences	37
Prof. courses	23-24
Prof. electives	14-17
Unrestricted electives	11-18
	127

*Could include 020 694 Food Plant Management (2).

FORESTRY

H.G. Gallaher, Head of Department

Professors Gallaher, Grey, and Strickler; Associate Professors Atchison, Biswell, Geyer,* Mahaffey,* Naughton, Nighswonger, and Pinkerton; Assistant Professors Aslin, Boutz, Bratton, Gaylor, Geisler, Gould, Hart, Lindsey, Loucks, Lynch, Moyer, Rowland, and Warner; Instructors Blair, Starkey, and Strine.

Undergraduate Study

The Department of Forestry offers a 2-year program in Pre-Forestry. Hours earned in this program can be transferred to most other colleges offering a degree in forestry.

The department also helps administer and advises students in the Natural Resource Management interdisciplinary curriculum. Students majoring in the Parks and Recreation Areas Management option of that curriculum are advised in the department. All professional courses in the Parks and Recreation Areas Management option are taught by the faculty of the Department of Forestry.

PRE-FORESTRY (2-yr. program)

Hours earned in this program can be transferred to most other colleges offering a degree in forestry. The required program follows:

FRESHMAN

Fall Semester

Biology	215 210	General Botany	4
English	229 100	English Composition I	3
Speech	281 105	Oral Communication I	2
Mathematics	245 100	College Algebra*	3
Forestry	033 281	Forestry Cons.	2
		Elective	1-2
			15-16

Spring Semester

Chemistry	221 110	General Chemistry	5
		OR	
	221 210	Chemistry I	4
English	229 120	English Composition II	3
Mathematics	245 150	Plane Trig.*	3
Forestry	033 330	Dendrology I	2
Forestry	033 210	Forestry Graphics	2
Phys. Ed.	261 101	Concepts in Phys. Ed.	1
			15-16

*Students with proper mathematics background are encouraged to substitute Calculus for these courses.

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Fall Semester

Agronomy	015 305	Soils	4
Geology	234 100	Geology I	3
Forestry	033 340	Dendrology II	2
Forestry	033 310	Forestry Instruments	2
Statistics	285 340	Biometrics I	3
Forestry	033 321	Forestry Resource Topics	1
		Economics I	3
			18

Spring Semester

Physics	265 115	Descriptive Physics	4
Civil Engg.	525 212	Elem. Surveying Engg.	3
Computer Sci.	286 200	Fund. of Comp. Prog. and FORTRAN Lang. Lab.	3
Computer Sci.	2B6 201		
Economics	225 120	Economics II	3
		Electives	2
			15

Undergraduate Credit

033 210. 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. 033-210-1-0114

033 281. Forest Conservation. (2) I. An introduction to American forestry. Forestry heritage in the U.S., importance of forests in soil and water conservation, multiple use concepts, management practices, utilization and policy. Two hours rec. a week. No prerequisites. 033-281-0-0114

033 311. 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. 030-311-1-0114

033 321. Forestry Resource Topics. (1) I. Student presentation of ideas, practices and concepts in forestry or related areas. One hour rec. a week. 033-320-0-0114

033 330. 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. 215 210 or equiv. 033-330-1-0114

033 340. 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. 215 210 or equiv. 033-340-1-0114

033 350. 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 & Rec. Mgmt. 033-350-3-0115

033 370. Natural Resources and Man. (3) I, S. A survey of the "web of life" concept of man's role in the ecosystem, in relation to the use of renewable and non-renewable natural resources. The impact of society, economics, politics and philosophy will be examined to determine utilization of natural resources. Three hours rec. a week. 033-370-0-0115

033 440. 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. 033-440-0-0115

Undergraduate And Graduate Credit In Minor Field

033 580. Park Operations. (3) II. Required field trips at the expense of the student. Planning, execution and supervision of field maintenance and operations; also capital budgeting, job planning, personnel practices, equipment operation and maintenance. Two hours lec. and two hours lab. Pr.: For. 370 and 440. 033-580-1-0115

Undergraduate And Graduate Credit

033 635. 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. per week. Field trips required. Pr.: For. 370 and 440. 033-635-1-0115

033 641. Forestry Problems. (Var.) I, II, S. Work is offered in various fields of forestry. Pr.: Consent of instructor. 033-641-3-0114

033 642. 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. 033-642-3-0115

033 645. Park Management Seminar. (1) I. Various guest speakers and exercises designed to offer the student opportunities to articulate and interact in structured small group situations, discussing Park and Recreational Area Management topics. 033-645-0-0115

033 660. 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. 033-660-0-0115

033 699. 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 580. 033-699-0-0115

033 796. Urban Forestry. (2) II. A study of the urban forest ecosystem to include amenities provided, composition, distribution, ownership, management, and monetary evaluation. Emphasis on publicly owned trees. Organization, staffing, financing, planning, legal considerations and public relations in the effective department. Field project and trip required. Pr.: Senior standing. 033-796-0-0115

GENERAL AGRICULTURE

Carroll V. Hess, Dean,*
David J. Mugler, Acting Dean*
Frank R. Carpenter, Associate Dean*
Lawrence H. Erpelding, Assistant Dean

Undergraduate Credit

035 101. 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. 035-101-0-0101

035 290. Honors Program Orientation. (1) I. Open to new students (freshmen and transfer students) who are likely candidates for admission to the Honors Program in Agriculture. Special meetings and seminars will be held to acquaint students with the objectives and functioning of the Honors Program in Agriculture. Optional for qualified students upon invitation by the dean. 035-290-0-0101

035 298. Honors Colloquium in Agriculture. (1) I, II. Open to freshmen and sophomores in the Honors Program for the College of Agriculture. Discussions and lectures on topics of interest to agriculture students. Seminar attendance may be included. 035-298-2-0101

035 301. Introductory Food Science and Technology. (3) I, II, S. Introduce and survey relationships of food raw materials and their methods of handling, manufacturing, distribution and consumption. 035-301-0-0101

035 310. Honors Seminar. (1) I, II. Consists of seminars, lectures, convocations selected by the students from an approved list. Twelve of these programs are required and students will be required to make written reports on each program selected. 035-310-0-0101

035 380. Honors Research Planning. (1) II. The student will develop literature screening methods and tools to prepare research proposals and obtain an overview of available research services. 035-380-0-0101

035 410. Agricultural Student Magazine. (1-3) I, II. Planning, interviewing, preparing stories, headlines, layouts, and editing, for the Kansas State Agriculturist published by students in the College of Agriculture. Pr.: 289 250 or 289 275. 035-410-3-0101

Undergraduate And Graduate Credit

035 500. 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. 035-500-0-0101

035 505. 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 Midwestern-Great Plains agriculture relative to climate, crops, soils, livestock practices, marketing, and cultural attitudes toward agriculture Pr.: Consent of instructor. 035-505-0-0101

035 510. 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. 035-510-0-0101

035 605. Extension Organization and Programs. (3) I. 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. 035-605-0-0101

035 610. Problems in Agricultural Publications. (1-3) II. Writing for trade and popular agricultural publications in area of individual student's competence, with emphasis on content of stories and principles involved in reader's understanding and accepting content expressed. Junior standing. 035-610-3-0101

035 630. 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.: General Ag 301 and junior standing. 035-630-3-0101

035 752. Principles of Teaching Adults in Extension. (3) II. 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. 035-752-0-0101

035 770. 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.: Journ. 285 or R-TV 330 and consent of supervising instructor. 035-770-3-0101

Graduate Credit

035 988. 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 equivalent. 035-988-0-0101

GRAIN SCIENCE AND INDUSTRY

Charles Deyoe, Head of Department*

Professors Deyoe,* Farrell,* Hoseney,* Pfost,* Ponte,* Schoeff,* Seib,* Tsen,* Ward,* and Wilcox; Adjunct Professors Finney,* Hoover,* Miller,* Pomeranz,* and Vetter;* Associate Professors Balding,* Eustace, Robinson,* and Wetzel;* Adjunct Associate Professor Chung;* Assistant Professors Bates,* Behnke, Marston,* and Pedersen; Instructor Wingfield. Emeritus: Professors MacMasters and Shellenberger; Assistant Professor Miller.

Undergraduate Study

The Department of Grain Science and Industry offers three curricula. One leads to a Bachelor of Science degree in Bakery Science and Management; another to a Bachelor of Science degree in Feed Science and Management; and the third to a Bachelor of Science degree in Milling Science and Management. In each curriculum an option can be selected in administration, chemistry or operations. This department also participates in the Food Science & Industry curriculum, see page 68.

BAKERY SCIENCE AND MANAGEMENT

B.S. in Bakery Science and Management; requires 127 hours.

FRESHMAN

Fall Semester		Course	Sem. Hrs.
Gen. Ag.	035 101	Ag. Orientation	1
Grain Science	045 100	Principles of Milling	3
Chemistry	221 210	Chemistry I	4
English	229 100	English Comp. I	3
Mathematics	245 100	College Algebra	3
Phys. Ed.	261 101	Concepts in Phys. Ed.	1
			15
Spring Semester			
Chemistry	221 230	Chemistry II	4
Economics	225 110	Economics I	3
English	229 120	English Comp. II	3
Mathematics	245 150	Plane Trig.	3
Speech	281 105	Oral Communication I	2
Mech. Engg.	560 212	Graphical Comm. I	2
			17

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Fall Semester			
Grain Science	045 120	Intro. Bakery Technology	2
Biology	215 198	Principles of Biology	4
		Option A, B or C	10
			16
Spring Semester			
Biology	215 555	Microbiology	4
		Hum. or Soc. Sci. Elec.	6
		Option A, B or C	6
			16

JUNIOR

Fall Semester			
Grain Science	045 635	Baking Science I	2
Grain Science	045 636	Baking Science I Lab.	2
Biology	215 520	Microbiology of Foods	4
		Option A, B or C	8
			16
Spring Semester			
Grain Science	045 637	Baking Science II	2
Grain Science	045 638	Baking Science II Lab.	1
Grain Science	045 602	Cereal Science	3
		Option A, B or C	9
			15

SENIOR

Fall Semester			
		Hum. or Soc. Sci. Elec.	3
		Option A, B or C	13
			16
Spring Semester			
Grain Science	045 634	Bakery Technology	3
Grain Science	045 651	Food and Feed Plant Sanit.	4
		Option A, B or C	9
			16

1. Administration Option (A)

Grain Science	045 300	Cereal and Feed Analysis	3
Biochemistry	211 120	Intro. Org. & Biol. Chem.	5
Economics	225 120	Economics II	3
Com. Science	2B6 200	Fund. Computer Prog.	3
Physics	265 113	General Physics I	4
Statistics	2B5 320	Elements of Statistics	3
Mathematics	245 500	Intro. Analytic Processes	3
Bus. Ad.	305 260	Fund. of Accounting	4
Bus. Ad.	305 292	Business Law I	3
Bus. Ad.	305 440	Marketing	3
Bus. Ad.	305 450	Business Finance	3
		Electives	9

And nine (9) hours from the following:

Economics	225 530	Money and Banking	3
Bus. Ad.	305 270	Managerial and Cost Cont.	3
Bus. Ad.	305 271	Cost Accounting	3
Bus. Ad.	305 420	Management Concepts	3
Bus. Ad.	305 461	Taxation I	3
Bus. Ad.	305 531	Personnel and Wage Admin.	3
Bus. Ad.	305 530	Labor Legislation	3
Bus. Ad.	305 540	Consumer Behavior	3
Bus. Ad.	305 542	Sales Management	3
Bus. Ad.	305 551	Investment	3
Industrial Engg.	550 501	Industrial Management	3

2. Chemistry Option (B)

Grain Science	045 300	Cereal and Feed Analysis	3
Grain Science	045 625	Flour and Dough Testing	3
Biochemistry	211 521	General Biochemistry	3
Biochemistry	211 522	General Biochemistry Lab.	2
Chemistry	221 271	Chemical Analysis	4
Chemistry	221 531	Organic Chemistry I	3
Chemistry	221 532	Organic Chemistry I Lab.	2
Chemistry	221 550	Organic Chemistry II	3
Chemistry	221 551	Organic Chemistry II Lab.	2
Chemistry	221 500	Desc. Physical Chemistry	3
Mathematics	245 220	Anal. Geom & Calc. I	4
Mathematics	245 221	Anal. Geom. & Calc. II	4
Physics	265 213	Engg. Physics I	5
Physics	265 214	Engg. Physics II	5
		Electives	9

3. Operations Option (C)

Biochemistry	211 120	Introd. Org. & Biol Chemistry	5
Mathematics	245 220	Anal. Geom. & Calc. I	4
Mathematics	245 221	Anal. Geom. & Calc. II	4
Mathematics	245 222	Anal. Geom. & Calc. III	4
Physics	265 213	Engg. Physics I	5
Physics	265 214	Engg. Physics II	5
Civil Engg.	525 333	Statics	3
Civil Engg	525 331	Strength of Matls. A	3
Elect. Engg.	530 519	Elec. Cir. Control	4
Industrial Engg.	550 501	Industrial Management	3
Mechanical Engg.	560 217	Graphical Communications II	3
Mechanical Engg.	560 513	Thermodynamics I	3
		Electives	9

FEED SCIENCE AND MANAGEMENT

B.S. in Feed Science and Management; requires 127 hours

FRESHMAN

Fall Semester		Course	Sem. Hrs.
Gen. Agr.	035 101	Ag Orientation	1
Grain Science	045 100	Principles of Milling	3
Chemistry	221 210	Chemistry I	4
English	229 100	English Composition I	3
Mathematics	245 100	College Algebra	3
Phys. Ed.	261 101	Concepts in Phys. Ed.	1
			15

Spring Semester

Chemistry	221 230	Chemistry II	4
English	229 120	English Comp. II	3
Mathematics	245 150	Plane Trig.	3
Speech	281 105	Oral Communication I	2
Mech. Engg.	560 212	Graphical Communications	2
		Option A, B, or C	3
			17

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Fall Semester

Grain Science	045 110	Flow Sheets	2
Biology	215 19B	Principles of Biology	4
Economics	225 110	Economics I	3
		Option A, B, or C	7
			16

Spring Semester

Dairy Science	025 200	Fundamentals of Nutrition	3
		Hum. or Soc. Sci. Elec.	6
		Option A, B, or C	7
			16

JUNIOR

Fall Semester

Grain Science	045 510	Feed Technology I	4
		Hum. or Soc. Sci. Elec.	3
		Option A, B, or C	9
			16

Spring Semester

Grain Science	045 661	Qualities of Feed and Food Ingredients	3
		Option A, B, or C	12
			15

SENIOR

Fall Semester

		Option A, B, or C	16
			16

Spring Semester

Grain Science	045 651	Food and Feed Plant Sanit.	4
		Option A, B, or C	12
			16

1. Administration Option (A)

Ag Econ.	010 520	Grain Marketing	3
Grain Science	045 300	Cereal and Feed Analysis	3
Grain Science	045 6B0	Feed Tech II	4
Biochemistry	211 120	Intro. Org. & Bio Chem.	5
Economics	225 120	Economics II	3
Mathematics	245 500	Intro. Analytic Processes	3
Physics	265 113	General Physics I	4
Physics	265 114	General Physics II	4
Statistics	2B5 320	Elements of Statistics	3
Computer Science	2B6 200	Fundamentals of Computer Programming	3
Bus. Ad.	305 260	Fundamentals of Accounting	3
Bus. Ad.	305 292	Business Law I	3
Bus. Ad.	305 450	Business Finance	3
		Electives	9

And twelve (12) hours from the following:

Bus. Ad.	305 270	Managerial and Cost Controls	3
Bus. Ad.	305 271	Cost Accounting	3
Bus. Ad.	305 420	Management Concepts	3
Bus. Ad.	305 461	Taxation I	3
Bus. Ad.	305 531	Personnel and Wage Admin.	3
Bus. Ad.	305 530	Labor Legislation	3
Bus. Ad.	305 540	Consumer Behavior	3
Bus. Ad.	305 542	Sales Management	3
Bus. Ad.	305 551	Investment	3
Industrial Engg.	550 501	Industrial Management	3
Economics	225 530	Money and Banking	3

2. Chemistry Option (B)

Grain Science	045 300	Cereal and Feed Analysis	3
Biochemistry	211 521	General Biochemistry	3
Biochemistry	211 522	General Biochemistry Lab.	2
Biology	215 201	Organismic Biology	5
Chemistry	221 271	Chemical Analysis	4
Chemistry	221 500	Desc. Phys. Chem.	3
Chemistry	221 531	Organic Chemistry I	3
Chemistry	221 532	Organic Chemistry I Lab.	2
Chemistry	221 550	Organic Chemistry II	3
Chemistry	221 551	Organic Chemistry II Lab.	2
Mathematics	245 220	Anal. Geom. & Calc. I	4
Mathematics	245 221	Anal. Geom. & Calc. II	4
Mathematics	245 222	Anal. Geom. & Calc. III	4
Physics	265 213	Engg. Physics I	5
Physics	265 214	Engg. Physics II	5
Statistics	285 703	Statistical Methods for Natural Scientists	3
		Electives	11

3. Operations Option (C)

Grain Science	045 640	Advanced Flow Sheets	2
Grain Science	045 680	Feed Technology II	4
Grain Science	045 685	Ad. Flour & Feed Technology	3
Grain Science	045 655	Flour & Feed Mill Construction	3
Biochemistry	211 120	Introd. Org. & Biol. Chemistry	5

Computer Science	286 200	Fund. of Computer Programming	3
Mathematics	245 220	Anal. Geom. & Calc. I	4
Mathematics	245 221	Anal. Geom. & Calc. II	4
Mathematics	245 222	Anal. Geom. & Calc. III	4
Mathematics	245 240	Ser. & Diff. Equa.	4
Physics	265 213	Engg. Physics I	5
Physics	265 214	Engg. Physics II	5
Civil Engg.	525 331	Strength of Matls. A	3
Civil Engg	525 333	Statics	3
Elect. Engg.	530 519	Elec. Cir. Control	4
Statistics	2B5 320	Elements of Statistics	3
		Electives	9

MILLING SCIENCE AND MANAGEMENT

B.S. in Milling Science and Management; requires 127 hours

FRESHMAN

Fall Semester		**Course**	**Sem. Hrs.**
General Ag.	035 101	Ag Orientation	1
Grain Science	045 100	Principles of Milling	3
Chemistry	221 210	Chemistry I	4
English	229 100	English Composition I	3
Mathematics	245 100	College Algebra	3
Phys. Ed.	261 101	Concepts in Phys. Ed.	1
			15
Spring Semester			
Chemistry	221 230	Chemistry II	4
English	229 120	English Composition II	3
Mathematics	245 150	Plane Trig.	3
Speech	281 105	Oral Comm. I	2
Mech. Engg.	560 212	Graphical Comm. I	2
		Option A, B, or C	3
			17

SOPHOMORE

Fall Semester			
Grain Science	045 110	Flow Sheets	2
Biology	215 198	Principles of Biology	4
Economics	225 110	Economics I	3
		Option A, B, or C	7
			16
Spring Semester			
Biology	215 555	Microbiology	4
		Hum. or Soc. Sci. Elec.	6
		Option A, B, or C	6
			16

JUNIOR

Fall Semester			
Grain Science	045 500	Milling Tech. I	4
Agronomy	015 340	Market Grading Cereals	2
		Hum. or Soc. Sci. Elec.	3
		Option A, B, or C	7
			16
Spring Semester			
Grain Science	045 602	Cereal Science	3
		Option A, B, or C	12
			15

SENIOR

Fall Semester			
Grain Science	045 635	Baking Science I	2
Grain Science	045 636	Baking Science I Lab.	2
		Option A, B, or C	12
			16
Spring Semester			
Grain Science	045 651	Food and Feed Plant Sanitation	4
		Option A, B, or C	12
			16

1. Administration Option (A)

Ag. Economics	010 520	Grain Marketing	3
Grain Science	045 300	Cereal and Feed Analysis	3
Biochemistry	211 120	Intro. Org. & Biol. Chemistry	5
Economics	225 120	Economics II	3
Mathematics	245 500	Intro. Anal. Proc.	3
Computer Science	286 200	Fund. Computer Program.	3
Physics	265 113	General Physics I	4
Physics	265 114	General Physics II	4
Statistics	2B5 320	Elements of Statistics	3
Bus. Ad.	305 260	Fund. of Accounting	3
Bus. Ad.	305 292	Business Law I	3
Bus. Ad.	305 450	Business Finance	3
		Electives	7

And nine (9) hours from the following:

Bus. Ad.	305 270	Managerial and Cost Controls	3
Bus. Ad.	305 271	Cost Accounting	3
Bus. Ad.	305 420	Management Concepts	3
Bus. Ad.	305 461	Taxation I	3
Bus. Ad.	305 530	Labor Legislation	3
Bus. Ad.	305 540	Consumer Behavior	3
Bus. Ad.	305 542	Sales Management	3
Bus. Ad.	305 551	Investment	3
Bus. Ad.	305 531	Personnel and Wage Admin.	3
Industrial Engg.	550 501	Industrial Management	3
Economics	225 530	Money and Banking	3

2. Chemistry Option (B)

Grain Science	045 300	Cereal and Feed Analysis	3
Grain Science	045 625	Flour and Dough Testing	3
Biochemistry	211 521	General Biochemistry	3
Biochemistry	211 522	General Biochem. Lab.	2
Chemistry	221 271	Chemical Analysis	4
Chemistry	221 500	Desc. Phys. Chemistry	3
Chemistry	221 531	Organic Chemistry I	3
Chemistry	221 532	Organic Chemistry I Lab.	2
Chemistry	221 550	Organic Chemistry II	3
Chemistry	221 551	Organic Chemistry II Lab.	2
Mathematics	245 220	Anal. Geom. & Calc. I	4
Mathematics	245 221	Anal. Geom. & Calc. II	4
Physics	265 213	Engg. Physics I	5
Physics	265 214	Engg. Physics II	5
		Electives	13

3. Operations Option (C)

Grain Science	045 640	Advanced Flow Sheets	2
Grain Science	045 670	Milling Technology II	4
Grain Science	045 6B5	Advanced Flour and Feed Technology	3
Grain Science	045 655	Flour & Feed Mill Construction	3
Biochemistry	211 120	Intro. Org. & Biol. Chem.	5
Mathematics	245 220	Anal. Geom. & Calc. I	4
Mathematics	245 221	Anal. Geom. & Calc. II	4
Mathematics	245 222	Anal. Geom. & Calc. III	4
Physics	265 213	Engg. Physics I	5
Physics	265 214	Engg. Physics II	5
Civil Engg.	525 331	Strength of Matls. A	3
Civil Engg.	525 333	Statics	3
Elect. Engg.	530 519	Elec. Cir. Control	4
		Electives	10

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: 1. mathematics, including college algebra; 2. analytical chemistry; 3. organic chemistry; 4. a course in physics; 5. 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 program.

Modern teaching and research facilities include a pilot bakery, feed mill and pilot flour mill. 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 such as business administration, plant management, quality control, nutrition, sales and services. Those students graduating with advanced degrees are especially qualified for positions in administration, teaching, research and production of a wide variety of foods.

Undergraduate Credit

045 100. Principles of Milling. (3) I, II. Introduction to flour and feed milling processes. Two hours lec. and three hours lab. a week. 045-100-1-0199

045 110. Flow Sheets. (2) I, II. The construction and assembling of a flow sheet. Six hours lab. a week. Pr.: Gr. Sc. 100, M.E. 212. 045-110-1-0199

045 120. Introductory Bakery Technology. (2) I. 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, donuts, 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. 045-120-1-0197

045 300. 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.: Chem. 250 and Biochem. 120. 045-300-1-0198

045 305. 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. 045-305-0-0198

Undergraduate And Graduate Credit In Minor Field

045 500. Milling Technology I. (4) I. Principles and practices of wheat flour milling with full scale equipment including grain storage, blending, cleaning, conditioning plant, and a modern pneumatic 200 hundred weight flour mill, with instrumentation and air conditioning, etc. Two hours lec. and six hours lab. a week. Pr.: Gr. Sc. 100 and 110. 045-500-1-1099

045 510. Feed Technology I. (4) I. Introduction to the engineering aspects 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.: Dy. Sc. 200 and Gr. Sc. 110. 045-510-1-0198

045 520. 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 A.S.I. 320. 045-520-1-0198

Undergraduate And Graduate Credit

045 602. Cereal Science. (3) II. The characteristics of cereals, legumes and their products. Three hours lec. a week. Pr.: Biochem. 120. 045-602-0-0198

045 625. Flour and Dough Testing. (3) I. Physical and chemical methods used in evaluating wheat flour and dough. One hour lec. and six hours lab. a week. Pr.: Gr. Sc. 602. 045-625-1-0197

045 629. Management Applications in Grain Processing Industries. (2) Intersession. Offered 1979 and alternate years. This course deals with major management principles and their specific application to the grain processing industries. Industry management personnel in management positions will give a larger number of lectures with case studies from their own experiences. Students will solve case examples. Pr.: Economics I or equiv. 045-629-2-0112

045 634. Bakery Technology. (3) II. Physical and engineering principles involved in baking processes. Study of materials handling, fluid flow, and heat transfer as related to the bakery operation. The layouts of facilities to produce baked goods are studied, and the students prepare their own bakery layout. Current problems of the baking industry are discussed. Three hours lec. a week. Pr.: Math. 110, Physics 113, and Gr. Sc. 638. 045-634-0-0197

045 635. 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.: Biochem. 120. 045-635-0-0197

045 636. Baking Science I Laboratory. (2) I, II. Laboratory exercises in theory and production of yeast leavened baked products. Six hours lab. a week. Pr.: Gr. Sc. 635 or concurrent enrollment. 045-636-1-0197

045 637. 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.: Gr. Sc. 635. 045-637-0-0197

045 638. Baking Science II Laboratory. (1) II. A laboratory course to accompany Gr. Sc. 637. Three hours lab. a week. Pr.: Gr. Sc. 637 or concurrent enrollment. 045-638-1-0197

045 640. Advanced Flow Sheets. (2) II. Offered on sufficient demand. Designing flow diagrams for flour mills, corn mills, or feed mills. Six hours lab. a week. Pr.: Gr. Sc. 500 or 510. 045-640-1-0199

045 651. 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. 045-651-1-0198

045 655. 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.: Gr. Sc. 500 or 510. 045-655-1-0199

045 661. Qualities of Feed and Food Ingredients. (3) II. 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.: Biochem. 120. 045-661-0-0198

045 670. Milling Technology II. (4) II. 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 practices of wheat conditioning, drying and aeration are elaborated upon. The processes for milling other grains such as corn, oats, sorghum, rice and rye are studied in theory and by practice on small scale laboratory milling units. Two hours lec. and six hours lab. a week. Pr.: Gr. Sc. 500. 045-670-1-0199

045 680. 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.: Gr. Sc. 510, Phys. 114 or 214, and one course each in statistics and computer programming. 045-680-1-0198

045 685. Advanced Flour and Feed Technology. (3) II. Offered on sufficient demand. Study of fluid flow and heat transfer in relation to grain processing. Introduction to distillation and extraction processes involved in grain processing. Two hours lec. and three hours lab. a week. Pr.: Gr. Sc. 670 or 680. 045-685-1-0199

045 700. Advanced Cereal Chemistry. (3) II. The chemistry of cereal components at the molec[illegible] and interactions [illegible] in producing an end-product, and [illegible] on nutritional properties. Three hours lec. a week. Pr.: Biochem. 521 and Gr. Sc. 602. 045-700-0-0198

045 710. 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.: Gr. Sc. 602 or 661. 045-710-0-0199

045 711. 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.: Chem. 271 or Gr. Sc. 300 and Biochem. 120. 045-711-0-0198

045 715. 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. 045-715-1-0198

045 790. Grain Science Problem. (Var.) I, II, S. Pr.: Consent of staff. 045-790-3-0196

Graduate Credit

045 801. 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.: Biochem. 521 and 522. 045-801-0-0196

045 899. Research in Grain Science. (Var.) I, II, S. Research may be used as basis for the M.S. thesis. Pr.: Consent of staff. 045-899-4-0196

045 900. 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. 045-900-2-0196

045 999. Research in Grain Science. (Var.) I, II, S. Research may be used as basis for Ph.D. dissertation. Pr.: Consent of staff. 045-999-4-0196

HORTICULTURE

R. W. Campbell, Head of Department

Professors Campbell,* Clayberg,* Greig,* Keen,* and Morrison;* Associate Professors Long,* Marr,* Mattson,* Miles,* Pair, and Stili;* Assistant Professors R.J. Campbell,* Carrow,* Hadie, Khatamian, Leuthold, Schueneman, van der Hoeven, and Wootton; Emeritus Professors Abmeyer, Amstein, Filinger, and Pickett.

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, page 65 and the food science and industry curriculum, page 68.

HORTICULTURE (4-yr. curriculum)

B.S. degree in Agriculture; requires 127 sem. hrs.

Horticulture is a science and an art involving plants grown for intensive food production, aesthetic value, environmental improvement or social-therapeutic effects. Students, in consultation with faculty advisers, may select courses of study in: horticultural science, horticultural industries, or urban horticulture.

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 that give emphasis necessary for career goals.

General Education Requirements

English Composition I	3
English Composition II	3
Oral Communication	2
Ag. Orientation	1
College Alg.*	3
Economics I	3
Chemistry I or General Chemistry	4-5
Gen. Botany or Principles of Biology	4
Concepts in Physical Education	1
Humanities and/or Social Science	9
Communications electives	3
Fund Accounting	4

*Students in the science option take calculus.

Horticulture and Agriculture Requirements for Science and Industries Options

Greenhouse Management	3
Vegetable Crop Ecology	3
Fruit Production	3
Plant Science	4
Soils	4
Elective in Entomology	3
Plant Pathology	3

1. 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. Job opportunities exist for teaching or research with colleges or universities, government, industries (agricultural chemicals, production, food science, processing, equipment companies, etc.) and international agriculture. Students electing this option take the general education requirements and the horticulture and agriculture requirements and the following additional requirements.

Animal Sci. & Ind.	005 500	Genetics	3
Biology	215	Biology Elective	3
Chemistry	221 230	Chemistry II	4
Physics	265 115	Descriptive Physics	4
Chemistry	221 190	Elem. Organic Chem.	3
Mathematics	245 210	Tech. Calculus	5
Computer Sci.	266	Computer Sci. Elec.	3
Statistics	285 340	Biometrics I	3
Biochem.	211 510	Gen. Plant Biochem.	4
Biology	215 600	Plant Physiology	4
Horticulture	040	Horticulture Elec.	15
		Free Electives	16

2. Horticultural Industries Option

The horticultural industries option is for students interested in the production of horticultural crops and the related businesses. It includes careers in horticultural enterprises such as retailing horticultural products, food inspection services, wholesale buyers, salework and extension activities. It also includes crop production endeavors such as nursery production, orchard management, vegetable production or greenhouse production. Students receive a solid background in horticulture with emphasis on crop production and additional business training. Requirements in addition to general education, and horticulture and agriculture requirements are as follows:

Horticulture	040 400	Plant Propagation	3
Horticulture	040	Horticulture Elec.	18
Chemistry	221 190	Elem. Organic Chem.	3
Biology	215	Biology Elec.	3
Business Admin.	305	Business Elec.	9
		Physical Sci. Elec.	3
		Math. Stat. Elec.	3
Computer Sci.	266	Computer Sci. Elec.	3
		Free Elec.	18-19

3. Urban Horticulture Option

The urban horticulture option is for students concerned about improving the quality of man's environment with plant materials. Students obtain a background in ornamental horticulture with additional training in landscape horticulture, municipal vegetation management, or public communications. Students will also elect political science and social science courses to better understand community and city government policies. Graduates will provide landscape services for municipal or public grounds and recreational areas; serve as city foresters; provide landscape contracting for residential, public and industrial grounds; provide public service information for radio, TV, magazines, newspapers, advertisers, etc; or conduct public relations work for industries, government, or other organizations. The following course requirements are necessary in addition to the previously listed general requirements:

Horticulture and Agriculture Requirements

Plant Science	4
Plant Propagation	3
Herb. Plant Materials	3
Woody Plant Materials	4
Greenhouse Management	3
Vegetable Crop Ecology	3
Fruit Production	3
Landscape Development	3
Pesticide Application Tech.	3
Soils	4
Plant Pathology	3
Entomology Elective	3
Woody Plant Mat. II	3

Additional Requirements

Business Elective	6
Math.-Phys. Science Elective	3
Biology Elective	3
Free Elective	13
Specialization Electives	20

HORTICULTURAL THERAPY (4-yr. curriculum)

B.S. in Agriculture; requires 127 sem. hrs.

The first horticultural therapy undergraduate training program in the United States was developed in 1971 as a cooperative agreement between Kansas State University and the Menninger Foundation, Topeka, Kansas. Courses are required in general education, horticulture and agriculture, and humanities and/or social sciences. Specialization electives may be selected in geriatrics, corrections, mental health, rehabilitation, or special education courses. Horticultural therapy graduates are employed in psychiatric, rehabilitation, and veterans administration hospitals, correctional institutions, geriatric and retirement centers, botanical gardens, schools, and community-based agencies. Clinical internships are required during the senior year at approved psychiatric hospitals, rehabilitation centers, veterans administration hospitals, correctional agencies, geriatric and retirement centers, or other community-based agencies. The requirements of the curriculum are as follows:

General Education Requirements

English Composition I	3
English Composition II	3
Oral Communication	2
Agricultural Orientation	1
College Algebra	3
Economics I	3
General Chemistry	5
General Botany	4
Concepts in Physical Education	1
Communications Elective	3

Horticulture and Agriculture Requirements

Horticulture Therapy Seminar	1
Hort. Therapy Clin. Studies	1
Herbaceous Plant Materials	3
Woody Plant Materials I	3
Home Floral Design	3
Plant Propagation	3
Horticultural Therapy Activities	2
Greenhouse Management	3
Fruit Production	3
Vegetable Crop Ecology	3
Landscape Horticulture	3
Plant Science	4
Plant Pathology	3
Entomology Electives	3
Turf Management	3

Humanities and/or Social Science Requirements

General Psychology	3
Introduction to Sociology	3
Group Behavior	3
Abnormal Psychology	3
Educational Psychology I	3
Design I	2
Specialization Electives	15

Internship Requirement

Horticultural Field Studies	6
Greenhouse Clinical Practices	6
Garden and Landscape Therapy	6

Electives

Free electives	8

RETAIL FLORICULTURE (2-yr. program)

This is a two-year technical program. It combines a year of supervised practical training with a full year of University course work in preparation for employment in a retail flower shop. The first year of instruction is at Kansas State University where the course sequence is completed during the fall, spring, and summer sessions. The second year, the student serves an apprenticeship at a selected retail florist business. Every effort is made to select a florist shop in a city of the student's choice. The apprentice will be an employee of the flower shop during this year of training and will receive a salary sufficient to meet normal living expenses.

Fall Semester			
Horticulture	040 132	Comm. Floral Arrangement I	3
Biology	215 210	General Botany	4
Psychology	273 110	General Psychology	3
Art	209 100	Design I	2
Horticulture	040 190	Hort. Science	3
			15
Spring Semester			
Horticulture	040 142	Comm. Floral Arrangement II	3
Horticulture	040 220	Plant Science	4
Clothing & Textiles	611 101	Design for Contemporary Living	3
Business Admin.	305 202	Small Business Oper.	3
Horticulture	040 325	Indoor Plts. Fls.	2
			15
Summer Term			
Business Admin.	305 260	Fundamentals of Accounting	3
English	229 100	English Composition I	3
			6

Graduate Study

Both the Master of Science and Doctor of Philosophy degrees are offered in horticulture. Graduate study leading to the degree Master of Science may be pursued in floriculture, fruit and nut

crops, horticultural therapy, vegetable crops and ornamental horticulture including arboriculture, turfgrass and urban horticulture.

Major work leading to the degree Doctor of Philosophy is offered in all fields listed above except horticultural therapy. Areas of proficiency include plant breeding and genetics, horticulture, plant environmental relationships, horticultural crop marketing and weed control. 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

040 132. Commercial Floral Arrangement I. (3) I. Floral arrangement for commercial flower shop. Fundamentals of floral design are emphasized. Two hours rec. and three hours lab. a week. For majors only. 040-132-1-0109

040 142. Commercial Floral Arrangement II. (3) II. Stylized floral design and related shop management for the commercial flower shop, including corsages, wedding decorations, funeral pieces and party and banquet decorations. Two hours rec. and three hours lab. a week. For majors only. 040-142-1-0109

040 152. Home Horticulture. (2) II. An introduction of horticultural practices utilized about the home. One hour rec. and two hours lab. per week. Open to non-horticulture majors only. 040-152-1-4-0109

040 190. Horticultural Science. (3) I. An orientation to horticultural practices and concepts which will be used as building blocks toward a major in horticulture. Three hours rec. per week. 040-190-0-0108

040 200. Plant Science. (4) I, II. Study of the principles of the production of economic plants, including morphology, taxonomy, physiology, ecology, propagation, preservation, storage, and utilization. Three hours lec. and one two-hour lab. a week. Taught in cooperation with the Department of Agronomy. 040-200-1-0108

040 299. 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. 040-299-1-0109

040 305. Plants, Man and Environment. (2) I, II. A study of how plants and man interact and how this interaction influences their environmental quality. Recognition of the essential nature of plants and their role in modifying the environment in which we live will be the primary objective. Two hours rec. a week. Non-major. No prerequisites. 040-305-0-0109

040 316. Home Floral Design. (3) I, II. Floral design for the home. Fundamentals of floral design are emphasized. Two hours rec. and three hours lab. a week. For non-majors. 040-316-1-0109

040 322. Horticultural Therapy Seminar. (1) I, II. Student or guest lecturer presentation of ideas, experiences, or concepts involving the use of horticultural therapy or related forms of therapy. 040-322-0-0108

040 325. 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. Non-major. No prerequisites. 040-325-0-0109

040 333. Gardening for Food. (2) II. An introductory course on how to plant, culture, harvest and store fruits and vegetables from the home standpoint. Two hours rec. per week. Non-major. No prerequisites. 040-333-0-0108

040 355. Horticultural Clinical Studies. (1) I, II, S. An introduction to application of horticultural therapy in various institutional settings such as psychiatric, correctional, rehabilitation, geriatric, and veteran's administration institutions. Pr.: Sophomore standing. 040-355-0-0108

040 360. Horticulture Therapy Activities. (2) I, II. Supervised training using plants as an activity therapy with geriatric, mentally retarded, or handicapped individuals. Pr.: Sophomore standing or consent of instructor. 040-360-2-0109

040 361. Herbaceous Plant Materials. (3) I. Annual and perennial flowers, ornamental and turf grasses, and tropical plants for ornamental planting. Pr.: 215 210 or equiv. 040-361-1-0109

040 374. 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. Field trips required. Pr.: Botany 215 210, Plant Science 040 200 or Principles of Biology 215 198. Two hours lec. and two hours lab. per week. 040-374-1-5-0109

040 375. Woody Plant Materials II. (3) II. Identification, ornamental characters, site requirements and use of woody ornamental conifers, broad leaf evergreens, vines, ground covers, deciduous flowering shrubs and small to medium size flowering trees. Field trips required. Pr.: Woody Plant Materials I 040 374. Two hours lec. and two hours lab. per week. 040-375-1-5-0109

040 400. Plant Propagation. (3) II. Designed to develop proficiency in the various skills and techniques necessary for propagation of horticultural plants. Basic fundamentals of seed structure and vegetative makeup of plants are emphasized. Two hours rec. and three hours lab. a week. Pr.: Biol. 210 or equiv. 040-400-1-0109

040 450. Landscape Development. (3) I. The location and arrangement of plants and other permanent features of the landscape around homes and other similar areas. Three hours lab. and one hour rec. per week. Pr.: Hort. 372. 040-450-1-0109

Undergraduate And Graduate Credit In Minor Field

040 505. Growing Media and Substrates. (2) II. Physical, chemical, biological properties and management of growing media and modified soils used for intensive horticultural plant production. Two hours lec. per week. Pr.: Agron. 015-305. 040-505-0-0109

040 508. Landscape Horticulture. (3) I. Fundamental principles of producing, planting, and maintaining ornamental plantings of trees, shrubs, perennials, and turf in the nursery, home grounds, parks, and similar areas. Two hours rec. and three hours lab. a week. Pr.: Biol. 210 or Plant Science 200. 040-508-1-0109

040 520. 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 three hours lab. a week. Pr.: Hort. 200 or equiv. 040-520-1-0108

040 551. Landscape Contracting. (3) II. The use, interpretation and development of planting plans (including contracting, construction, and specifications) as applied to landscape horticulture. Pr.: Hort. 450 or consent of instructor. 040-551-1-0109

040 560. Vegetable Crop Ecology. (3) II. Study of ecological principles involved in the production of vegetable crops, with emphasis on environmental conditions. Two hours lec. and three hours lab. or field trips per week. Pr.: Hort. 200. 040-560-1-0108

040 570. Greenhouse Management. (3) I., II. Greenhouse construction, environmental control, crop scheduling and management. Two hours rec. and three hours lab. a week. Pr.: Hort. 200. 040-570-1-0109

040 575. Nursery Management. (3) II. A study of the various practices and methods of operating a commercial nursery for the production of ornamental wood plants used for landscaping purposes. Two hours rec. and three hours lab. a week. Pr.: Biol. 210, Hort. 200 and Agron. 305. 040-605-1-0109

Undergraduate And Graduate Credit

040 612. Turf Management. (3) I. Methods and principles of establishing and maintaining special purpose turf. Three hours rec. per week. Pr.: Hort. 200, Agron. 305 or consent of instructor. 040-612-0-0109

040 613. Topics in Turf Management I. (Variable) I, odd numbered years. Practical aspects of turf management are emphasized including: grass identification, report writing, and construction methods. Pr.: 040 612. 040-613-1-4-0109

040 614. Topics in Turf Management II. (Variable) I, even numbered years. Practical and theoretical aspects of water management for turf areas, including irrigation and drainage. Pr.: 040 613. 040-614-1-4-0109

040 620. Arboriculture. (3) II. Principles and practices of maintaining shade and ornamental trees under urban environments. Two hours rec. and three hours lab. a week. Pr.: Hort. 200, Agron. 305 or consent of instructor. 040-620-1-0109

040 625. Floriculture. (3) II. The principles and commercial practices for producing greenhouse florist crops. The relationship is stressed between a plant's physiological response and its greenhouse environment. Three hours rec. a week. Pr.: Hort. 200. 040-625-0-0109

040 638. 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 area interest. For juniors and seniors in horticulture only. Pr.: Hort. 150 and 200, plus one other core curriculum horticulture course. 040-638-2-0108

040 640. Horticultural Problems. (Var.) I, II, S. Problems and reports in floriculture, olericulture, ornamental horticulture, and pomology. Pr.: Consent of instructor. 040-640-3-0109

040 661. Greenhouse Clinical Practices. (3-6) I, II, S. Supervised training in the application of greenhouse practices and the use of plants and flowers in the treatment of institutional patients. Pr.: Consent of instructor. 040-661-2-0109

040 662. Garden and Landscape Therapy. (3-6) I, II, S. Training in supervision of patients in flower and vegetable gardening as a therapy. The use of landscape to better the trainees' understanding of how institutional landscape maintenance can be used in therapy. Pr.: Consent of instructor. 040-662-2-0109

040 682. Pesticide Application Technology. (3) II. A discussion of the equipment, procedure, and techniques used in controlling pests on crops. Emphasis is placed on types, theory, operation and maintenance of application equipment. Two hours rec. and three hours lab. per week. Pr.: Entomology 300 or Plant Pathology 301 or equivalent. 040-682-1-6-0108

040 700. Vegetable Crop Physiology. (3) I. Offered 1978-79 and alt. years. Study of applied physiological responses of selected vegetable crops on grade, quality, storage and marketing of these products. Three hours lec. a week. Field trip required. Pr.: Hort. 200. 040-700-0-0108

040 706. Turfgrass Science. (3) II. A study of environmental stresses on turfgrass growth and management. A review of current literature and research reports on grasses used for fine turf. Written and oral reports. Three hours rec. per week. Pr.: Hort. 612 or consent of instructor. 040-706-0-0109

040 730. Fruit Science. (3) II. Spring '79 and alt. years. Detailed discussion of selected and important pomological topics. Laboratory includes exercises on practical and research topics with emphasis on latter. Two hours rec. and three hours lab. a week. Pr.: Hort. 520. 040-730-1-0108

040 740. Horticultural Plant Breeding. (3) II. Breeding methods and their application to the economic improvement of flowers, fruits, shrubs, trees, turfgrasses, and vegetables. Pr.: AS&I 500 or equiv. 040-740-0-0108

040 755. Urban Tree Management. (2) II. A study of management problems of publicly owned shade trees. Financing, public relations, personnel, organization, regulations, and planning in the effective department. Field trip required. Pr.: Senior standing and 040 620. 040-755-0-0109

040 792. Handling and Processing Fruits and Vegetables. (3) I. Fall '77 and alt. years. Field trips required. Principles of harvesting, grading, handling, nutritive value and processing fruits and vegetable crops. Pr.: Biol. 198 or equiv. and a course in organic chemistry or biochemistry. 040-792-0-0108

Graduate Credit

040 846. 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. per week. Pr.: One statistics course or consent of instructor. 040-846-1-0109

040 850. Advances in Horticultural Therapy. (3) II. 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.: 040 661 and 040 662. 040-850-0-0108

040 898. Master's Report. (2) I, II, S. Investigations in pomology, olericulture, floriculture, or ornamental horticulture for preparation of master's report. Pr.: Consent of instructor. 040-898-4-0108

040 899. Research—M.S. (Var.) I, II, S. Investigations in pomology, olericulture, floriculture, or ornamental horticulture for preparation of master's thesis. Pr.: Consent of instructor. 040-899-4-0108

040 910. 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 Dept. of Agronomy. See 015 910.) 040-910-0-0108

040 921. Horticultural Crop Nutrition. (2) I. Fall '77 and alt. 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 Biol. 600 or equiv. 040-921-0-0108

040 930. 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 Dept. of Agronomy, 015 930.) 040-930-0-0108

040 940. Plant Regulators in Horticulture. (3) II. Offered 1978 and alt. 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. 1 hour lec. and 2 hours recitation per week. Pr.: 211 510 or 215 600 and one graduate plant commodity course. 040-940-0-0108

040 951. Horticulture Graduate Seminar. (1) I, II. A discussion of investigational works in the various branches of horticulture. 040-951-0-0108

040 955. Controlled Plant Environment. (3) II. Spring '79 and alt. years. Study of the greenhouse and plant growth chamber as tools for plant science research. Three hours rec. per week. Pr.: Consent of instructor. 040-955-0-0109

040 961. Dormancy and Regeneration. (2) I. Fall '78 and alt. years. Physiological and anatomical bases for dormancy, rest and regeneration in seeds, buds and stems. Manipulation and use in research. Pr.: Hort. 400 or consent of instructor. 040-961-0-0109

040 999. Research in Horticulture, Ph.D. (Var.) I, II, S. Investigations in pomology, olericulture, floriculture, and ornamental horticulture. Data collected may form basis for a thesis or dissertation. Pr.: Consent of instructor. 040-999-4-0108

NATURAL RESOURCE MANAGEMENT

B.S. degree in Agriculture; requires 127 sem. hrs.

Advisers: Bidwell and Owensby, Agronomy; Mahaffey and Warner, Forestry.

This curriculum is designed for the individual who wishes to interpret and apply ecological principles in the solution of environmental problems involving renewable natural resources. It contains courses in the social sciences and humanities which help make students sensitive to environmental surroundings, courses in the physical and biological sciences which help them understand and solve environmental problems, and courses in communications which make it easy to interpret, convey and employ solutions.

The three options, (A) soil and water conservation, (B) range management and (C) park and recreation areas management, are administered by a committee of faculty from the departments of Agronomy, Agricultural Economics, Agricultural Engineering, Horticulture, and Forestry. These committee members serve as advisers to students in the different options. Persons interested in the curriculum should contact the College of Agriculture dean's office for additional information and selection of an adviser. Required courses for the curriculum and the three options are as follows.

1. Soil and Water Conservation Option

General Requirements for Option A: Soil and Water Conservation (These students are advised through the Department of Agronomy.)

FRESHMAN

Fall Semester		Spring Semester	
Ag Orientation	1	English Composition II	3
Chemistry I	4	Plane Trigonometry	3
English Composition I	3	Oral Communication I	2
College Algebra	3	Gen. Botany or Prin. Biol.	4
Intro. to Pol. Sci. or State & Local Govt.	3	Chemistry II	4
Concepts in Phys. Ed.	1		
	15		16

SOPHOMORE

Fall Semester		Spring Semester	
Economics I	3	Soils	4
Geology I	3	Prin. Ag. Econ.	3
Plant Sci. or Crop Sci.	4	Option & Electives	9-10
General Physics I	4		
	14		17

JUNIOR

Fall Semester		Spring Semester	
Forest Cons. or Range Mgmt.	2-3	Humanities or Soc. Sci.*	3
Intro. to Sociology	3	Fund. of Ecology	4
Math. or Statistics	3-4	Economic Entomology	3
Humanities or Soc. Sci.*	3	Option & Electives	6
Option & Electives	3-4		
	15-17		16

SENIOR

Fall Semester		Spring Semester	
Fund. of Computer Prog.	2	Option & Electives	16
Language Lab	1		
Option & Electives	13		
	16		16

Special Option Courses

General Organic Chemistry	5
Organismic Biology	5
Microbiology	4
Soil Conservation	3
Env. Chemistry Lab.	1
Intro. to Planning	3
Soil Conservation	3

Select courses from four of the following areas:

Crop and Soil Management	3
Soil as a Natural Resource	3
Soil-Plant Relationships or Chemical Properties of Soils	3
Crop Ecology or Turf Management	3
Physical Environment of Crops & Soils or Conservation Survey & Planning	3
Option Electives	21
	54
Total	127

*To be selected from the list of suggested humanities and social science electives, page 51.

2. Range Management Option

General Requirements for Option B: Range Management. (These students are advised through the Department of Agronomy.)

FRESHMAN

Fall Semester		Spring Semester	
Ag Orientation	1	English Composition II	3
Chemistry I	4	Plane Trigonometry	3
English Composition I	3	Oral Communication I	2
College Algebra	3	Gen. Botany or Prin. Biol.	4
Intro. to Pol. Sci. or State & Local Govt.	3	Chemistry II	4
Concepts in Phys. Ed.	1		
			16

SOPHOMORE

Fall Semester		Spring Semester	
Economics I	3	Soils	4
Geology I	3	Prin. Ag Econ.	3
Plant Sci. or Crop Sci.	4	Option & Electives	8-9
Gen. Physics I or Descriptive Physics	4		
	14		15-16

JUNIOR

Fall Semester		Spring Semester	
Forest Cons. or Range Mgmt.	2-3	Humanities or Soc. Sci.*	3
Intro. to Sociology	3	Fund. of Ecology	3
Math. or Statistics	3-4	Economic Entomology	3
Humanities or Soc. Sci.*	3	Options & Electives	7
Option & Electives	3-4		
	15-17		16

SENIOR

Fall Semester		Spring Semester	
Fund. of Computer Prog.	2	Option & Electives	16
Language Lab	1		
Option & Electives	13		
	16		16

Special Option Courses:

Principles of Animal Science	3
Organismic Biology	5
Gen. Organic Chemistry	3
Range Management II	3
Field Course, Range Management	2
Ident. Range, Pasture Plants	2
Range Mgmt. Problems	3
Soil as a Natural Resource	3
Beef Science	3
Higher Plants	4
Electives	18
Option & Electives	49
Total	127

*To be selected from a list of suggested humanities and social science electives, page 51.

3. Park and Recreation Areas Management Option

General Requirements for Option C. Park and Recreation Areas Management. (These students are advised through the Department of Forestry.)

FRESHMAN

Fall Semester		Spring Semester	
Ag Orientation	1	English Composition II	3
General Chemistry	5	Plane Trigonometry	3
English Composition I	3	Oral Communication I	2
College Algebra	3	Gen. Botany or Prin. Biol.	4
Intro. to Pol. Sci. or State & Local Govt.	3	Option & Electives	3
Concepts in Phys. Ed.	1		
	16		15

SOPHOMORE

Fall Semester		Spring Semester	
Economics I	3	Soils	4
Geology I	3	Intro. to Sociology	3
Plant Science	4	Dendrology I & II, Woody Plant Matls., or Higher Plants	3-6
General Physics I or Descriptive Physics	4	Option & Electives	5
	14		15-18

JUNIOR

Fall Semester		Spring Semester	
For. Cons. or Range Mgmt.	2-3	Humanities or Soc. Sci.*	3
Natural Res. Econ.	3	Fund. of Ecology	3
Math. or Statistics	3-4	Insects of Home, Lawn Garden	3
Humanities or Soc. Sci.*	3	Option & Electives	6
Option & Electives	3-4		
	14-17		15

SENIOR

Fall Semester		Spring Semester	
Fund. of Computer Prog.	2	Recreation Program	3
Language Lab	1	Options & Electives	13
Option & Electives	13		
	16		16

Special Option Courses:

Natural Resources and Man	3
Use of Natural Resources for Leisure	3
Methods of Envir. Interpretation	3
Park Administration & Mgmt.	3
Park Operations	3
Park & Rec. Areas Field Studies	2
Park Management Seminar	1
Turf Management	3
Aboriculture	3
	27

Select 9 hours from the following:

Travel, Tourism & Park Management	3
Landscape Horticulture	3
Nursery Management	3
Plant Pathology	3
Plant Protection	3
Soil Interp. for Land Use Planning	3
	9
General Electives	13
Option & Electives	48
Total:	127

*To be selected from a list of suggested humanities and social science electives, page 51

PLANT PATHOLOGY

B.S. in Agriculture under the Crop Protection Curriculum which includes a Plant Pathology Science Option (See page 65).

J.F. Shepard, Head of Department*

Professors Dickerson,* Hansing,* Shepard,* and Willis;* Associate Professors Browder,* Claflin,* Johnson,* Niblett,* Schwenk,* Stuteville,* and Uyemoto;* Assistant Professors Eversmeyer,* Nesmith,* and Sauer;* Adjunct Professor Kramer;* Emeritus Professor King.

Plant pathology is the study of plant diseases, their economic effects, causes, nature and control. Opportunities for graduates in plant pathology include research and development for many types of agencies, teaching extension sales and commercial service. Industry, government, educational institutions and private foundations employ plant pathologists on a world-wide basis.

Undergraduate Study

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, see page 65. Students who wish to specialize in the studey 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, in addition to the general requirements for the curriculum, the following courses. (See page 65).

Major Courses		Semester Hours
215 210	General Botany	4
015 200	Plant Science	4
215 640	Introductory Mycology	4
050 510	Principles of Horticultural Plant Pathology OR	3
050 520	Principles of Field Crop Pathology	3
	Electives in the Botanical Sciences	9

Supporting Courses		
215 555	Microbiology	4
005 500	Genetics	3
221 230	Chemistry II	4
221 350	General Organic Chemistry	3
221 351	General Organic Chemistry Lab.	2
015 305	Soils	4
245 150	Plane Trigonometry	3
285 340	Biometrics I	3
265 113	General Physics I	4

One of the following:

265 193	Descriptive Meteorology	3
265 114	General Physics II	4

One of the following:

211 510	General Plant Biochemistry	4
211 521	Gen. Biochem. Lec. and	3
211 522	Gen. Biochem. Lab.	2
211 655	Biochem. I Lec. and	3
211 656	Biochem I Lab.	2

One of the following		
003 300	Economic Entomology	3
030 312	Gen Entomology	2
	and	
030 313	Gen Entomology Lab	1
One or more of the following		
245 220	Analytical Geometry and Calculus I	4
	OR	
286 200	Fundamentals of Computer Programming	3
One or more of the following		
005 102	Principles of Animal Sci.	3
005 103	Animal Sciences & Industry	1
010 100	Principles of Agri Econ	3
506 300	Engg in Agric	4
	Plus	
	An Elective in Accounting or Bus Admin.	3

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 from plant pathology. Specialized areas of study include epidemiology, disease physiology, nematology, virology, host-parasite relationships, ecology of disease development, biochemistry of pathogenicity, disease resistance and chemical control. Research is conducted on diseases of grain crops, forage crops, fruits, vegetables, ornamentals, turf and stored grain.

Departmental facilities include physiological laboratories, environmental chambers, greenhouses and experimental field plots. Students have access to the electron microscope laboratory, scanning electron microscope laboratory, 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

050 510. Principles of Horticultural Plant Pathology. (3) I. An introductory course in the principles of Plant Pathology that stresses causes, effects, and control of soft rots, seedling blights, vascular wilts, leaf spots and blights, cankers, and galls of vegetables, fruits, ornamentals, and turf, caused by biotic and abiotic agents. Two hours lec., one two-hour lab. per week. Pr.: Biol. 198, 210 or equiv. 050-510-1-5-0404

050 520. Principles of Field Crop Pathology. (3) II. An introductory course in the cause, effect, and control of plant diseases, emphasizing but not limited to diseases of field crops. Two hours lec., one two-hour lab. per week. Pr.: Biol. 198, 210, or equiv. 050-520-1-5-0404

Undergraduate And Graduate Credit

050 609. Plant Disease Diagnosis. (2) I. Principles of, and practical experience in diagnosis of diseases of field crops and horticultural plants. One hour lec., one two-hour lab. per week. Pr.: Plant Path. 510 or 520; concurrent enrollment in Entom. 611 is encouraged. 050-609-1-3-0404

050 612. Plant Disease Control. (2) I. Disease control strategies are developed in a practical manner. Control economics and practice are considered in relation to principles and current research. Biological, cultural, physical, chemical, and regulatory methods are discussed. Two hours lec. per week. Pr.: Plant Path. 510 or 520. 050-612-1-5-0404

050 651. 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 two 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. 230, Entom. 312 and 313, Plant Path. 510 or 520. 050-651-0-0404

050 701. Seminar in Crop Protection. (1) II. A discussion of modern developments in the use of integrated pest management. Pr.: an introductory course each in Plant Pathology, Entomology, and Weed Science. One hour discussion per week. 050-701-0-0404

050 721. Plant Pathogens I. (3) I. A study of the principles and techniques of Plant Pathology with emphasis on crop diseases caused by fungi, bacteria, and abiotic factors. Five hours combined lec. and lab. per week. Pr.: Plant Path. 510 or 520 or equiv. 050-721-1-4-0404

050 722. Plant Pathogens II. (3) II. A study of the principles and techniques of Plant Pathology with emphasis on crop diseases caused by viruses and nematodes. Six hours combined lec. and lab. per week. Pr.: Plant Path. 510 or 520. 050-722-1-4-0404

050 750. 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. 050-750-3-0404

Graduate Credit

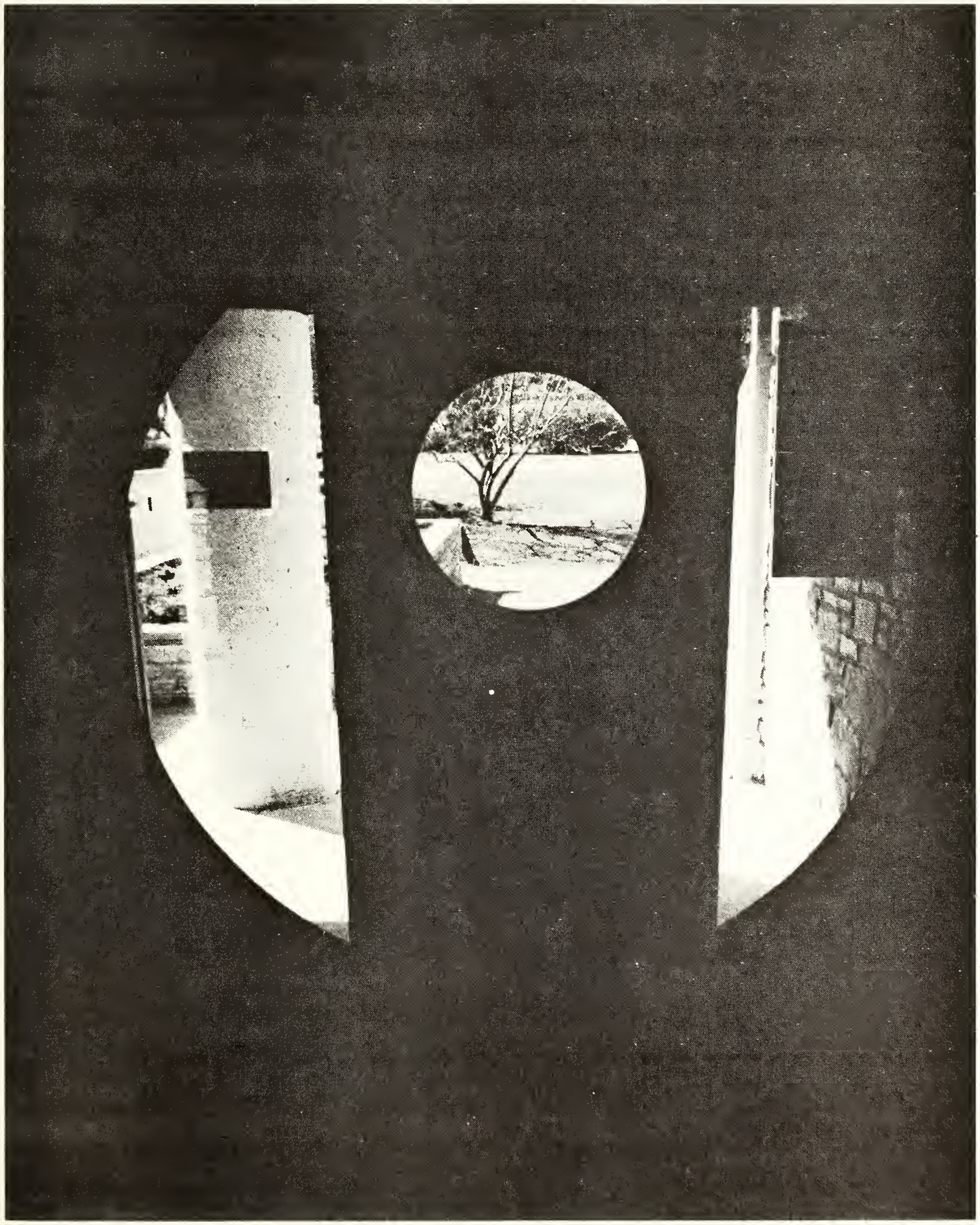
050 860. Host Plant Resistance to Disease. (2) II. Offered in 1978-79 and alt. years. A consideration of basic and applied aspects of controlling plant disease through host plant resistance. The relationships of disease components are elucidated, and types and characteristics of plant disease resistances are considered. Methods of using disease resistance in crop production are developed. Two hours lec./discussion per week. Pr.: Plant Path. 510 or 520 and a basic course in genetics. 050-860-0-0404

050 870. Seminar in Plant Pathology. (1) I, II. Reports in the field of plant pathology. Pr.: Consent of instructor. 050-870-0-0404

050 899. 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. 050-899-4-0404

050 920. Topics in Plant Pathology. (Var.) I, II, S. Discussions and lectures on important areas and contributions in the field of phytopathology. Pr.: Graduate standing. 050-920-0-0404

050 999. 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. 050-999-4-0404



College of Architecture and Design

Bernd Foerster, Dean
William R. Jahnke, Assistant Dean

The College of Architecture and Design provides the opportunity for professional study in 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 curriculum is accredited by the American Society of Landscape Architects (ASLA). The planning curriculum is recognized by the American Institute of Planners in cooperation with the Association of Collegiate Schools of Planning.

The College of Architecture and Design consists of five administrative departments: Pre-Design Professions, Architecture, Interior Architecture, Landscape Architecture and Regional and Community Planning.

Bachelor's degrees are offered in each of the following areas:

Architecture (curriculum on page 85)
Interior Architecture (curriculum on page 85)
Landscape Architecture (curriculum on page 85)

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 a number of students. Early development of such academic plans will facilitate coordination of courses and permit completion of degree requirements in a minimum number of semesters. Interested students should consult the assistant dean.

Graduate Programs

The College of Architecture and Design offers graduate study leading to the Master of Architecture, Master of Landscape Architecture or Master of Regional and Community Planning degrees. Additional information on the graduate programs is included under Graduate School, page 33.

Transfer Students

It is advised that students enter the college at the freshman level. Transfer credits for professional courses will be accepted by the Pre-Design Professions department if they are earned in environmental design programs accredited by NAAB, ASLA or FIDER. Students wishing to transfer credits from programs not accredited by one of these agencies will be afforded an opportunity to be evaluated or examined for each applicable course. A portfolio of the student's work and/or an interview may be required.

In order to complete the program in the least amount of time, it may be necessary for transfer students to attend summer school before their first fall semester in the college.

Summer School

Entering freshmen and transfer students will find that some courses may be taken during the summer session. Such courses are especially advantageous for transfer students and those who wish to remove deficiencies. Detailed information on specific courses is contained in the Summer School Catalog, which may be obtained from the Director of Admissions, Kansas State University, Manhattan, KS 66506.

Student Projects

All programs within the College of Architecture and Design involve extensive project work. Students are cautioned to budget sufficient funds to cover the cost of materials and supplies, many of which are expendable. Material costs will be higher than those published for non-studio curricula.

Student projects, assignments, presentations and models may be retained by the various departments. Students are advised to assemble a photographic file of their work for their portfolio.

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.

Pre-Design Professions Program

The curricula in architecture, interior architecture and landscape architecture start in the beginning of the third year, and students are not admitted prior to successful completion of the pre-design professions curriculum. This two-year program provides common background and skills, and enables students to select their field on the basis of understanding gained in the college. Admission to the professional programs is determined every spring by the faculty in each department. Selection criteria include evidence of motivation, aptitude and scholarship.

Pre-Design Professions—100PDP

65 CREDIT HOURS REQUIRED

FIRST YEAR

First Semester				Second Semester			
104 200	Env. Des. Ed. & Univ.	1		104 201	Survey Des. Profs.	1	
104 210	Des. Graphics I	3		104 211	Des. Graphics II	3	
229 100	English Comp. I	3		229 120	English Comp. II	3	
	Art Elective	2			Art Elective	2	
	Soc. Sci. Elective	3			Soc. Sci. Elective	3	
	Humanities Elective	3			Math Elective	3	
261 001	Concepts P.E.	1		281 105	Oral Communications	2	
		16				17	

SECOND YEAR

Third Semester				Fourth Semester			
104 250	Hist. Des. Envir. I	3		104 251	Hist. Des. Envir. II	3	
104 260	Envir. Des. St. I	4		104 261	Envir. Des. St. II	4	
104 271	Elem. & Iss. of Env. Des.	2		104 280	Landscape Ecology	2	
104 290	Basic Constr. Tech. I	3		104 291	Basic Constr. Tech. II	3	
	Science Elective	3			Science Elective	3	
	Art Elective	2					
		17				15	

After satisfactory completion of the Pre-Design Professions curriculum, students are eligible to apply for admission to the Department of Architecture, the Department of Landscape Architecture, or the Department of Interior Architecture.

Professional Program in Architecture—115AR

Fifth Semester				Sixth Semester			
105 401	Arch. Des. Studio I	5		105 402	Arch. Des. Studio II	5	
105 413	Envir. Syst. Arch. I	4		105 520	Envir. Syst. Arch. II	3	
105 450	Struct. Syst. Arch. I	3		105 451	Struct. Syst. Arch. II	3	
				105 433	Bldg. Const. Syst. Arch. I	3	
	Electives*	6			Electives*	3	
		18				17	
Seventh Semester				**Eighth Semester**			
105 603	Arch. Des. Studio III	5		105 604	Arch. Des. Studio IV	5	
105 521	Envir. Syst. Arch. III	3			Electives*	10	
105 434	Bldg. Const. Syst. Arch. II	3				15	
109 315	Intro. to Planning	3		**OR**			
	Electives*	3		105 504	Arch. Internship**	15	
		17				15	
Ninth Semester				**Tenth Semester**			
105 801	Arch. Des. Studio V	5		105 802	Arch. Des. Studio VI	5	
105 756	Topics Pro. Prac. I	2		105 757	Topics Pro. Pract. II	2	
105 800	Arch. Des. Program	2					
	Electives*	8			Electives*	10	
		17				17	

*Students must successfully complete at least 18 professional support elective credits and as many as 22 free elective credits.

**Architecture Internship may be elected in either the eighth or ninth semester in lieu of 10 professional support elective credits and either Arch. Des. Studio IV or Arch. Des. Studio V.

Interior Architecture Program—150 ARI

Fifth Semester				Sixth Semester			
107 401	Int. Arch. Des. Studio I	5		107 402	Int. Arch. Des. Studio II	5	
107 409	Finishing	3		107 420	Theory of Furn. Des.	2	
107 413	Envir. Systems Arch. I	4		105 520	Envir. Syst. Arch. II	3	
107 415	Hist. Int. Arch.	2			Art Elective	4	
	Electives	3			Electives	3	
		17				17	
Seventh Semester				**Eighth Semester**			
107 603	Int. Arch. Des. Studio III	5		107 604	Int. Arch. Des. Studio IV	5	
107 407	Design Workshop I	3		107 608	Design Workshop II	3	
105 433	Arch. Construction I	3		160 260	Textiles	3	
105 521	Envir. Syst. Arch. III	3			Electives	6	
	Electives	3					
		17				17	
Ninth Semester				**Tenth Semester**			
107 801	Int. Arch. Des. Studio V	5		107 802	Int. Arch. Des. Studio VI	5	
107 710	Design Workshop III	4		107 783	Contempr. Furn. Des.	4	
105 720	Sem. Envir. Behavior	3		107 820	Int. Arch. Seminar	3	
107 753	Contract Des. Pract. I	2		107 754	Contract Des. Pract. II	2	
	Electives	3			Electives	2	
		17				16	

Landscape Architecture Program—180LAR

Fifth Semester				Sixth Semester			
110 431	Landsc. Arch. Des. Studio I	4		110 432	Landsc. Arch. Des. Studio II	4	
110 436	Landsc. Construction I	3		110 437	Landsc. Construction II	3	
040 372	Woody Plant Materials**	4		110 204	L.A. Delineation Tech.	2	
525 212	Elem. Surveying Engr.*	3		109 315	Intro. Planning	3	
	Science Elective	3			Science Elective***	3	
		17				15	
Seventh Semester				**Eighth Semester**			
110 641	Landsc. Arch. Des. Studio III	4		110 642	Landsc. Arch. Des. Studio IV	4	
110 647	Landsc. Construction III	3		040 508	Landsc. Horticulture	3	
110 434	Planting Design I	3		110 435	Planting Design II	3	
110 501	Landsc. Arch. Seminar	1		110 510	Landsc. Arch. Seminar	1	
110 756	Des. Parks & Rec. Areas	3		525 718	Photo Interpretation	3	
	Art Elective	2		110 644	Community Site Planning	3	
		16				17	

(SUMMER INTERNSHIP****)

Ninth Semester		
110 801	Landsc. Arch. Design V	5
110 643	Planting Design III	3
110 501	Landsc. Arch. Seminar	1
	Business Elective	3
	General Elective	3
110 645	Professional Intern. ****	2
		17

Tenth Semester		
110 802	Landsc. Arch. Design VI	5
110 753	Professional Practice	2
110 501	Landsc. Arch. Seminar	1
	Business Elective	3
	General Elective	4
110 433	History & Theory L.A.	3
		18

*Surveying is taught in Civil Engineering and Plane Trigonometry (245 150), or equivalent, is a prerequisite.

**Woody Plant Materials is taught in Horticulture and Forestry and the prerequisite is one of these three courses: Princ. of Biology, 215 198; General Botany, 215 210; or Hort./Agronomy, Plant Science, 040 200.

***A special course in Agronomy, Soil Interpretations for Land-use Planning, 105 675, is available for Landscape Architects and Planners.

****Internship in a professional office is completed during the summer and the student is enrolled and credited in the next fall semester.

PRE-DESIGN PROFESSIONS

Ifan Payne, Head of Department*

Professors Ealy* and Foerster;* Associate Professors Martin, Miller,* Payne,* and Wendt; Assistant Professors Beckwith, Chapman, Chelz, Foruzani, Haycock, Longstreth,* Melahn, Melnick, Quinn, Fly, Sullivan, Van Oudenallen, and Weisman;* Instructors McDonald and Tilson; Emeritus: Professor Fischer.

For curriculum, see page 85.

014 200. Environmental Design Education and the University. (1) I. Introduction to environmental design education; discovery of the resources of the department, college, and university. One hour lec. per week. 104-200-0-0201

104 201. Survey of the Design Professions. (1) II. Illustrates the challenges and career opportunities of the design professions; identification of attitudes and aptitudes required of environmental designers. One hour lec. per week. 104-201-0-0201

104 210 and 104 211. Design Graphics I and II. Intensive skill development in graphic communication: utilizing media to visualize and record physical design information, including the methodologies of orthographic, oblique, and perspective systems. Exercises in freehand, instrumental diagramatic, computer, numerical, and presentation modes. Six hours lab. per week.

104 210. Design Graphics I. (3) I, II, S. 104-210-1-0201

104 211. Design Graphics II. (3) I, II, S. Pr.: 104 210. 104-211-1-0201

104 250 and 104 251. History of the Designed Environment I and II. A study of the history of the man-made environment and its relationship to the societies that produced it; classic times to present. Three lectures per week.

104 250 H.D.E. I. (3) I. Pr.: None. 104-250-0-0201

104 251 H.D.E. II. (3) II. Pr.: None. 104-251-0-0201

104 260 and 104 261. Environmental Design Studio I and II. Visualization and representation of spatial concepts; approaches to physical design; exercises and experiments involving space organization, form, color, texture, materials, structure and climate; interaction of functional, material, social and aesthetic needs. Ten hours studio and lec. per week.

104 260. E.D.S. I. (4) I, II, S. Pr.: 104 211. 104-260-1-0201

104 261. E.D.S. II. (4) I, II, S. Pr.: 104 260. 104-261-1-0201

104 271. Elements and Issues of Environmental Design. (2) I. Principles of environmental design; attitudes toward the physical surroundings; identification of issues confronting environmental designers; exposure to and reinforcement of the design vocabulary. Two hours lec. per week. Pr.: Second year classification. 104-271-0-0201

104 280. Landscape Ecology. (2) II. An understanding of the relationship of people to their natural environment, and the role of the physical planner in that relationship. Two hours lec. per week. 104-280-0-0201

104 290 and 104 291. Basic Construction Technology I and II. 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. Principles of mechanics and strength of materials; types of loads and methods of load transfer; conceptual approach to structures; interrelation of structural systems; economic considerations and design criteria. Three hours lec. per week.

104 290 B.C.T. I. (3) I, II. Pr.: 104 211. 104-290-0-0201

104 291 B.C.T. II. (3) I, II. Pr.: 104 290. 104-291-0-0201

104 299. 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. 104-299-4-0201

104 370. Perspective Methodology for Designers. (2) Intersession. Mechanical and freehand perspective drawing methodology as a systematic approach to three-dimensional design. Projects will be directed towards the individual student's area of interest and need. Pr.: 104 208 and two hours drawing credit. 104-370-0-0201

104 380. Visual Thinking. (2) Intersession. An analysis of man's recognition, visualization, and recording of environmental experiences. Experimental exercises in sensory stimulation and response recording. 104-380-0-0201

104 510. Man and His Surroundings. (3) II, S. Man as builder-modifier; 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 lecture-discussion per week. Not for students in architecture, interior architecture and landscape architecture. 104-510-0-0201

104 520. 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 non-majors/architecture and design majors by permission of the department head only. 104-520-0-0201

104 699. 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. 104-699-4-0201

ARCHITECTURE

Eugene Kremer, Head of Department*

Professors Chang,* Foerster,* Heintzelman,* and Jahnke;* Associate Professors Bryant, Burnham, Christensen,* Coates, DeVilbiss, Ernst,* Hall,* Kremer,* Reid,* Sanner,* Selfridge,* Slack, Stotesbury,* Weisenburger,* Wendt, and Windley;* Assistant Professors Friedberg,* Mross, Shepard, Wagner, and Weisman;* instructors Locker and Snead; Emeritus: Professors Fischer, Krider, and Welgel.

For curriculum, see page 85.

The professional program leading to the Bachelor of Architecture consists of a three-year course of study following the two-year pre-design professions program.

The Kansas State University Bachelor of Architecture degree is accredited by the National Architectural Accrediting Board. This professional degree and three years' practical experience under the supervision of a registered architect qualify one to take the National Council of Architectural Registration Board's Professional Architectural

Licensing Exam, without the need to take a qualifying examination in most states.

One of the few certainties the future holds is change. It is for this reason that the professional program in architecture emphasizes principles and problem-solving processes rather than focusing on mastery of the myriad technical details of the profession which are rapidly supplanted by new social, political, and technological developments. The design studio experience forms the core of the program: here concepts earlier introduced through courses in human needs, history, construction technology, structures, and environmental control systems are synthesized. An elective 30-week internship program which may include work-study experience in professional offices, industry, or governmental agencies, affords advanced students an opportunity to work in a professional context and to apply the problem-solving approaches they have developed.

Emphasis areas in the Master of Architecture curriculum accommodate students with certain four-year baccalaureate degrees, or graduates of five- or six-year programs in architecture. Applicants are considered upon the merits of their academic backgrounds and proposed programs of study.

Courses in Architecture

Undergraduate Credit

105 301. 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. 105-301-0-0202

105 401 and 105 402. 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. Fifteen hours studio per week.

105 401. A.D.S. I. (5) I. Pr.: Admission to the Professional Program and 104 261. 105-401-1-0202

105 402. A.D.S. II. (5) II, S. Pr.: 105 401. 105-402-1-0202

105 413. 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. 105-413-0-0202

105 433 and 105 434. Building Construction Systems in Architecture I and II. (3) 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 of lecture and five and one-half hours of studio per week.

105 433. Bldg. Const. Syst. In Arch. I. (3) II. Pr.: 104 290, 104 291, and admission to a professional program in the college or third year standing in the Department of Architectural Engineering and Construction Science. 105-433-1-0202

105 434. Bldg. Const. Syst. in Arch. II. (3) I. Pr.: 105 433. 105-434-1-0202

105 450. Structural Systems in Architecture I. (3) 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. per week. Pr.: Admission to a professional program in the college and 104 290, 104 291. 105-450-1-0202

105 451. Structural Systems in Architecture II. (3) Continuation of the study of major sub-systems begun in 105 450, 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. per week. Pr.: 105 450. 105-451-1-0202

105 460. Mosaic. (2) I, II. Design and execution of mosaic compositions in glass, stone and other materials; study of historic and modern examples of mosaic and related media, with particular reference to their architectural uses and techniques. May be taken for a total of six (6) credits. Six hours lab. a week. Pr.: Sophomore classification and six credits in art or approval of insturctor. 105-460-1-0202

105 475. 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. 105-475-3-0202

105 504. Architectural Internship. (15) I, II. 30 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.: 105 434, 105 603, and approval of the department head. 105-504-2-0202

Undergraduate Or Graduate Credit In Minor Field

105 514 and 105 515. Environmental Systems In Architecture II and III. (3) and (3). 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. per week.

105 514. E.S.A. II. (3). Pr.: 105 413. 105-514-0-0202

105 515. E.S.A. III. (3). Pr.: 105 413. 105-515-0-0202

105 566. 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. 105-566-3-0202

105 601. 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 man-made 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. per week. Pr.: 104 261 or approval of instructor. 105-601-0-0202

105 603. Architectural Design Studio III. (5) I. Problem analysis and program development, generation of alternate solutions, selection and refinement of the building design. Fifteen hours studio per week. Pr.: 105 402. 105-603-1-0202

105 604. 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. Fifteen hours studio per week. Pr.: 105 603. 105-604-1-0202

105 655. 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. 105-655-2-0202

Undergraduate Or Graduate Credit

105 703. Environmental Aesthetics. (3) II. Problems involving aesthetics in areas related to student's major field. Three hours per week. Pr.: Senior standing in architecture, landscape architecture, interior architecture, architectural structures, urban design. 105-703-0-0202

105 704. Environmental Seminar. (Var.) I, II. Environmental systems related to human perception, reactions and behavior. Pr.: Senior standing. 105-704-3-0202

105 710. 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. 105-710-0-0202

105 715. Theory of Design. (3) I. Analysis of theories and philosophies in the design professions including those in related societal and technological fields. Pr.: 105 603 or 107 603 or 110 641. 105-715-0-0202

105 720. Seminar in Environmental 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 man-built environment. Three hours lecture-seminar per week. Pr.: Senior standing or permission of instructor. 105-720-0-0202

105 725. 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 man-built environment. Three hours lecture-seminar per week. Pr.: Senior standing. 105-725-0-0202

105 730. Environmental Design and the Aging Process. (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 per week. Pr.: Senior or graduate standing. 105-730-0-0202.

105 752. 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 105 450 and 105 451. Pr.: 105 450, 105 451. 105-752-varies-0202

105 756 and 105 757. 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. per week.

105 756. Topics I. (2) I, II. Pr.: Fourth year standing. 105-756-0-0202

105 757. Topics II. (2) I, II. Pr.: Fourth year standing. 105-757-0-0202

105 765. 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. 105-765-3-0202

105 800. Architectural Design Programming. (2) I, II, S. Independent development of the program for 105 802, Architectural Design VI, under the direction of a faculty committee. Must be taken in residence and may be concurrent with 105 604 or 105 801. Pr.: 105 603 and approval of the faculty committee. 105-800-3-0202

105 801. Architectural Design Studio V. (5) I, II. Integration of the physiological, psychological, and sociological parameters in the design of Man'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. Fifteen hours studio per week. Pr.: 105 604. 105-801-1-0202

105 802. Architectural Design Studio VI. (5) I, II. Terminal Project: Analysis, programming, and development of a selected project approved by the faculty. Complete integration of function, space definition systems, and environmental technology. Fifteen hours studio per week. Pr.: 105 800 and 105 801. 105-802-1-0202

Graduate Credit

105 810. Research in Architecture. (Var.) I, II, S. Study in architecture and related fields leading to thesis or non-thesis project. Pr.: Approval of instructor. 105-810-4-0202

105 830. Advanced Architectural Design. (Var.) I, II, S. Studies related to a comprehensive program in architecture. Pr.: 105 802. 105-830-3-0202

INTERIOR ARCHITECTURE

Jack C. Durgan, Head of Department

Professors Durgan* and Foerster;* Associate Professor McGraw;* Assistant Professor Murphy; Instructors Paas and Tyler.

The Bachelor of Interior Architecture professional program consists of a three-year course of study following the two-year pre-design professions program.

The curriculum in interior architecture is structured for students who plan a professional career in space planning in the areas of 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 related to these particular areas. Special emphasis is placed on spatial organization, behavior analysis, space component design and construction, the integration of environmental systems, and the preparation of working drawings and contract documents.

Graduates are generally employed by professional architectural offices, space planning and interior design firms, and corporate organizations.

Graduate Work

The degree Master of Architecture is available to students holding a four-year bachelor's degree or a five- or six-year architectural degree who wish to concentrate in interior architecture.

Courses in Interior Architecture

Undergraduate Credit

107 406. Problems in Interior Architecture. (Var.) I, II. Study of specific interior architectural problems under direct supervision of a member of the departmental staff. Pr.: Approval of Instructor. 107-406-0-0203

107 409. Finishing. (3) II. Methods of finishing various materials in interiors. Six hours lab. a week. Pr.: 104 261. 107-409-0-0203

107 414. General Design Workshop. (3) S. Design, construction and finishing of contemporary furniture and accessories. Pr.: Open to all students in the University with junior standing. 107-414-1-0203

107 415. History of Interior Architecture. (2) I. History of the design of architectural interiors and its related components. Special emphasis upon the developments of the 20th century. Pr.: Admission to professional program in architecture, interior architecture, or landscape architecture. Two hours lec. 107-415-0-0203

107 420. 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. 107-420-0-0203

Undergraduate Credit And Graduate Credit

107 401, 402, 603, 604, 801, and 802. 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. **Interior Architectural Design Studios I and II are not for graduate credit.**

107 401. Interior Architectural Design Studio I. (5) I. Pr.: Admission to professional program and 104 261. 107-401-1-0203

107 402. Interior Architectural Design Studio II. (5) II. Pr.: 107 401. 107-402-1-0203

107 603. Interior Architectural Design Studio III. (5) I. Pr.: 107 402. 107-603-1-0203

107 604. Interior Architectural Design Studio IV. (5) II. Pr.: 107 603. 107-604-1-0203

107 801. Interior Architectural Design Studio V. (5) I. Pr.: 107 604. 107-801-1-0203

107 802. Interior Architectural Design Studio VI. (5) II. Pr.: 107 801. 107-802-1-0203

107 407, 408, and 710. Design Workshop I through III. 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.

107 407. Design Workshop I. (3) I. Pr.: Admission to a professional program and consent of instructor. 107-407-1-0203

107 408. Design Workshop II. (3) II. Pr.: 107 407. 107-408-1-0203

107 710. Design Workshop III. (4) I. Pr.: 107 408 or graduate standing. 107-710-1-0203

107 753. Contract Design Practice I. (2) I. Introduction to business practice, specification and contract document procedures, purchasing and professional responsibilities. Pr.: 107 604 or graduate standing. 107-753-0-0203

107 754. Contract Design Practice II. (2) II. Evaluation, selection and specification of interior architectural materials, surfaces and finishes. Pr.: 107 753. 107-754-0-0203

107 783. Contemporary Furniture Design. (4) II. Experimentation in the design of spatial component systems, utilizing advanced techniques in construction methods and materials. Pr.: 107 710 or graduate standing. 107-783-1-0203

Graduate Credit

107 500. Advanced Design Workshop. (3) S. Advanced instruction in the design, construction and finishing of contemporary furniture and accessories. **Pr.: Graduate standing.** 107-500-1-0203

107 820. Interior Architecture Seminar. (3) II. Readings and discussions of contemporary thought and movements within the field of Interior Architecture with special emphasis on the societal factors which produce and affect change. Pr.: 107 801 or graduate standing. 107-820-0-0203

107 821. Advanced Interior Architectural Design. (4) I, II. Advanced study of interior space planning and interior component design. Pr.: Professional design degree. 107-821-0-0203

107 830. Problems in Interior Architecture. (Var.) I, II. Study of specific interior architectural problems under direct supervision of a member of the departmental staff. Pr.: Professional design degree and approval of instructor. 107-830-3-0203

LANDSCAPE ARCHITECTURE

Robert P. Ealy, Head of Department*

Professor Ealy;* Associate Professors Barnes,* Day,* Oblinger,* and Page;* Assistant Professors Austin,* Haldeman,* Law, Lin,* Melnick and Sullivan; Instructors Edison and Pool; Emeritus: Professor Quinlan.

The Bachelor of Landscape Architecture professional program consists of a three-year course of study following the two-year pre-design professions program.

The curriculum is designed to prepare students for the field of 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 man's impact upon the environment, both natural and man-made, is emphasized. The Bachelor of Landscape Architecture degree is accredited by the American Society of Landscape Architects.

Graduate Study

Individual graduate programs in the Master of Landscape Architecture curriculum can accommodate students with a bachelor's degree in many fields of study. Applicants are considered on the merits of their academic background and proposed program of study.

Courses in Landscape Architecture

Undergraduate Credit

110 204. Landscape Architectural Delineation Techniques. (2) 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.: 104 210, 211, 260, and 261. 110-204-1-0204

110 250. 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 per week. A general service course for non-Architecture and Design majors. 110-250-1-0204

110 431 and 110 432. Landscape Architectural Design Studio I & 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.

110 431. L.A.D. I. (4) I. Two hours lec. and six hours design studio per week. Pr.: Admission to the Professional Program and 104 261, 280. 110-431-1-0204

110 432. L.A.D. II. (4) II. Two hours lec. and six hours design studio per week. Pr.: 110 431. 110-432-1-0204

110 433. History and Theory of Landscape Design. (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 L.A. Program. 110-433-0-0204

110 434. Planting Design I. (3) I. Use of plants as design elements in landscape architectural developments. Plant characteristics of value to the landscape architect. Plant adaptation and ecological considerations. Three hours lec. per week. Field trips required. Pr.: 040 372, 104 280. 110-434-1-0204

110 435. Planting Design II. (3) II. Preparation of planting plans and their use as working drawings; specification writing; contractor relationships and maintenance procedures. Eight hours studio per week. Pr.: 110 434. 110-435-1-0204

110 436. 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.: 104 280, 290, 291. Conc. with 525 212. 110-436-1-0204

110 437. Landscape Construction II. (3) II. Cont. of L.A. 436. To include site layout, road alignment, construction detailing and cost estimating. Two hours lec. and six hours studio a week. Pr.: L.A. 436. 110-437-1-0204

110 440. Problems in Landscape Design. (Var.) I, II, S. Assigned problems and reports in the area of landscape architecture. Pr.: Junior standing. 110-440-3-0204

Undergraduate And Graduate Credit In Minor Field

110 501. Landscape Architecture Seminar. (1) 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. 110-501-2-0204

110 641 and 110 642. Landscape Architectural Design Studio III & 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.

110 641. L.A.D. III. (4) I. Twelve hours design studio per week. Pr.: 110 432 and 110 436. 110-641-1-0204

110 642. L.A.D. IV. (4) II. Twelve hours design studio per week. Pr.: 110 641 and 110 437. 110-642-1-0204

110 643. Planting Design III. (3) I. A continuation of Planting Design II at a more comprehensive scale. Pr.: 110 435. 110-643-1-0204

110 645. 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.: 110 432, 110 437. 110-645-2-0204

110 647. Landscape Construction III. (3) I. Cont. of L.A. 437 to include utilities routing, area lighting, irrigation systems and construction specification writing. Two hours lec. and six hours studio a week. Pr.: 110 437. 110-647-1-0204

Advanced Undergraduate And Graduate Credit

110 741. Problems in Landscape Architecture. (Var.) I, II, S. Specific problems and/or reports in the area of landscape architecture. Pr.: Advanced undergraduate standing or graduate standing. 110-741-3-0204

110 744. Community Site Planning. (3) II. Growth and development of cities and towns; land subdivision. Eight hours lab. a week. Pr.: Planning 315 or consent of instructor. 110-744-1-0204

110 750. Graduate Seminar in Landscape Architecture. (1-3) I, II. Discussion of current issues in the profession of landscape architecture. Pr.: Graduate standing in the department. 110-750-0-0204

110 753. 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. 110-753-0-0204

110 755. Site Analysis and Planning. (3) II. An ecological approach to analysis of the earth's surface as a base plane for the projects of the architect, landscape architect and planner. Six hours studio a week. Pr.: 104 280, C.E. 212 or consent of instructor. 110-755-1-0204

110 756. 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 110-756-0-0204

110 757. Design for Special Populations. (3) II. Design of exterior environments to accommodate the handicapped and disadvantaged individual. Pr.: Advanced undergraduate or graduate standing. 110-757-0-0204

110 758. 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. 110-758-1-0204

110 759. Landscape Resource Evaluation. (3) I, II, S. 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. 110-759-0-0204

110 801 and 110 802. Landscape Architectural Design Studio V & 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.

110 801. L.A.D. V. (5) I. Fifteen hours design studio per week. Pr.: 110 642 and 110 647. 110-801-1-0204

110 802. L.A.D. VI. (5) II. Terminal project. Individual studies approved by departmental faculty. Fifteen hours design studio per week. Pr.: 110 801 and 110 643. 110-802-1-0204

Graduate Credit Only

110 860. Advanced Planting Design. (1-4) I, II, S. Special studies and designs in advanced planting design. Pr.: 110 643. 110-860-4-0204

110 870. Advanced Landscape Architecture. (1-4) I, II, S. Special studies and designs in advanced landscape architecture. Pr.: 110 802. 110-870-4-0204

110 880. Advanced Landscape Construction. (1-4) I, II, S. Specialized study of large-scale landscape planning involving landscape construction and grading. Pr.: 110 647. 110-880-4-0204

110 899. 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. 110-899-4-0204

REGIONAL AND COMMUNITY PLANNING

Vernon P. Deines, Head of Department*

Professors Deines* and Foerster;* Associate Professors Barnes,* Bereuter, Ernst,* Keller,* McGraw,* Reid,* Selfridge,* and Weisenburger;* Assistant Professors Keithley* and Nanetti.

Study leading to the two-year professional graduate degree Master of Regional and Community Planning, requiring a minimum of 48 graduate credit hours, is offered on an interdepartmental basis 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 Home Economics.

Applicants with undergraduate degrees in administration, agriculture, architecture, business, construction science, economics, ecology, education, engineering, geology, geography, government, home economics, landscape architecture, 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 such conditions as it may impose.

Undergraduate students may elect to take planning courses either in preparation for graduate study or in fulfillment of undergraduate minors, options and electives.

The following list indicates suggested undergraduate study in planning:

Introduction to Planning
Planning and Development Codes
Community Development Workshop
City Planning I
Regional Planning I
Housing and Renewal
Planning Theory
Economics I, Economics II and Urban and Regional Economics
Man, Space and the Environment and Urban Geography
Introduction to Sociology and Urban Sociology
Introduction to Political Science and Urban Politics
A course in statistics
A course in data processing

The following list indicates a suggested undergraduate option in Urban Design and Planning for students in the design and construction professions:

Introduction to Planning
Planning and Development Codes
Community Development Workshop
City Planning I
Urban Design I
Housing and Renewal
Urban Visual Analysis
Institutional Planning and Development
Economics I, Economics II and Urban and Regional Economics
Man, Space and the Environment and Urban Geography
Introduction to Sociology and Urban Sociology
Urban Transportation Analysis I
Site Analysis and Planning
Environmental Aesthetics
Introduction to Political Science and Urban Politics
A course in statistics
A course in data processing

Graduate students also may work towards the traditional one-year Professional Master's Degree, Master of Arts or Master of Science degree with a minor in Urban design or planning. Select a minor from the following courses:

Planning Principles
Housing and Renewal
Urban Visual Analysis
Institutional Planning and Development
Planning Theory
Planning Analysis
Land Use Planning
City Planning I and II
Urban Design I and II
Regional Planning I and II
Seminar in Planning
Planning Administration and Implementation
Advanced Planning Theory
Topics in Planning

Courses in Regional and Community Planning

Undergraduate Credit

109 315. 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. 109-315-0-0206

Undergraduate And Graduate Credit

109 610. Community Development Workshop. (Var.) I, II, S. Application of interdisciplinary and interprofessional team techniques to the organization, planning, design, development and evaluation of community development projects on specific topics with real clients and actual locations. Pr.: Introduction to Planning or equivalent course and approval of the instructor. 109-610-2-0206

109 620. Planning and Development Codes. (3) I, II. Introduction to federal, state and local legislation and interpretation of codes related to planning, design and construction. Pr.: 109 215 or equivalent and junior standing 109-620-0-0206

109 700. Planning Analysis. (3) I, II. Introduction to quantitative methods in planning to measure change in the socio-economic-political-physical environment and to analyze the interrelations that guide formulation of comprehensive planning. Pr.: 109 315 or equivalent and Econ. 555 or equivalent. 109-700-1-0206

109 705. Planning Communications. (Var.) I. Study and application of communication concepts and media utilized in regional and community planning to convey information regarding the spatial and aspatial aspects of the environment. Pr.: Senior standing and approval of instructor. 109-705-1-0206

109 710. Urban Visual Analysis. (3) [illegible] analysis of urban form and space in relation [illegible] ities and values. Methods of visual perce[illegible]alysis are reviewed and applied to contemporary urban form and space. Pr.: 109 745 or equivalent. 109-710-1-0206

109 715. 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. 109-715-0-0206

109 720. Institutional Planning and Development. (3) II. Examination of institutional functions, administrative structures, resources and policies in the planning and development of physical facilities. Pr.: 109 715 or equivalent and nine other credit hours in planning and/or administration courses. 109-720-0-0206

109 725. 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. 109-725-0-0206

109 735. City Planning I. (3) I, S. 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.: 109 715 or 725. 109-735-1-0206

109 745. Urban Design I. (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.: 109 315, 715 or 725. 109-745-1-0206

109 750. Housing and Renewal. (3) II. Review and evaluation of federal, state and local policies, and programs of urban renewal and housing. Pr.: 109 715 or 725. 109-750-0-0206

109 755. Regional Planning I. (3) II. 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.: 109 715 or 725. 109-755-1-0206

109 770. Land Use Planning. (3) I, II. Examination of legal history and modern judicial methods for land use regulation within constitutional limits. Introduction to zoning, subdivision and other police power controls within a comprehensive planning process. Pr.: 109 715 or equivalent and Econ. 555 or equivalent. 109-770-0-0206

Graduate Credit

109 800. Research Methods in Planning. (3) I, II. Considerations in the selection, collection, analysis and interpretation of data. Introduction to modeling, information systems, planning studies, forecast techniques, and computer programs. Pr.: 109 715 or equivalent and one course each in graphics, statistics, and computer programming. 109-800-1-0206

109 805. Internship in Planning. (0) I, II, S. Assignment to a planning staff for a period of 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. 109-805-2-0206

109 810. 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.: 109 715 and 725 or concurrent enrollment. 109-810-2-0206

109 815. Seminar in Planning. (Var.) 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 in planning or urban design. 109-815-0-0206

109 820. Planning Administration and Implementation. (3) I, II. Considerations for the planning director in the administration of the planning function and the implementation of the planning process. Pr.: Completion of one semester of graduate study in planning. 109-820-0-0206

109 825. Advanced Planning Theory. (3) II. Review of empirical and normative theories of regional and community planning; analysis of principles, hypotheses, concepts and law of planning and synthesis of a theory of planning. Pr.: 109 725 and completion of two semesters of graduate study in planning. 109-825-0-0206

109 835. City Planning II. (3) I. Synthesis of city growth and change in relation to planning theory and socio-economic-political determinants. Criteria and methodology for city analysis and planning are reviewed and applied to the elements of the contemporary city. Pr.: 109 735 or equiv. 109-835-1-0206

109 845. Urban Design II. (3) II. Synthesis of urban form and space in relation to aesthetic theories and values and socio-economic-political determinants. Criteria and methodology for urban design and planning are reviewed and applied to contemporary urban form and space. Pr.: 109 745 or equiv. 109-845-1-0206

109 855. Regional Planning II. (3) I. Synthesis of regional growth and change in relation to planning theory and socio-economic-political determinants. Criteria and methodology for regional analysis and planning are reviewed and applied to the elements of the contemporary region. Pr.: 109 755 or equivalent. 109-855-1-0206

109 880. Topics in Planning. (Var.) I, II, S. The study of selected concepts and trends in regional and community planning and development. 109 715 or graduate standing. 109-880-0-0206

109 890. 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. 109-890-4-0206

CENTER FOR COMMUNITY AND REGIONAL PLANNING

Vernon P. Deines, Director

The Center for Community and Regional Planning has a three-fold function: the creation of public understanding of comprehensive planning and development; the supply of basic information about new techniques and programs in planning and development; and the conduct of research on planning and development problems and methods. These functions of the center are closely related to the graduate program in community and regional planning.



College of Arts and Sciences

William L. Stamey, Dean
William E. Carpenter, Associate Dean
Sara S. Chapman, Assistant Dean
John M. Lilley, Assistant Dean
Marjorie Cleland, Assistant to the Dean

The College of Arts and Sciences through its 48 majors, 2 secondary majors, and over 2,000 courses offers programs of study which enable students to acquire a broad preparation for life in a democratic society, to develop skills in communication, to appreciate the heritage of the past, to understand the laws of nature, to participate in the arts, and to maintain healthy bodies.

Career Preparation

Majors in the College of Arts and Sciences range from those which are professional and related to specific jobs after graduation to those which are related to jobs in a more general way. Liberal-arts education has always been the preparation of students not only for jobs but for a liberated life inclusive of job and leisure. In this rapidly-changing society the best "job insurance" is not narrow training in specific skills but broad education which prepares for a variety of jobs and professions.

Advising

One of the excellent advantages of majoring in the College of Arts and Sciences is the opportunity to work closely with an academic adviser. Students with unspecified, general and pre-professional majors are advised in the office of the dean. Students with other majors will be assigned an adviser by the department head who supervises their major. Advisers will try to insure that students understand and design their curricula around the traditional goals of a liberal education. These goals will include, among others: the ability to think, speak and write with clarity and precision; knowledge of another culture and, where appropriate, another language; knowledge and appreciation of science and technology; familiarity with major artistic and literary forms; experience in dealing with moral and ethical issues; participation in some artistic endeavor; experience with a lifetime sport; and competency in a particular discipline.

Available Majors and Degrees

A list of the majors in the College of Arts and Sciences is given in the table below. The degrees are: Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music, Bachelor of Science, and Bachelor of Science in Music Education. In addition to these degrees, the Associate of Arts and the Associate in Science degrees with unspecified majors are offered. The specific requirements for a degree in the various curricula are indicated on subsequent pages. The majors in the college with degree choices are:

Anthropology, BA or BS 183
Art, BA or BFA 104
Biochemistry, BA or BS 107
Biology, BA or BS 109
  General Biology
  Microbiology
  Fisheries & Wildlife Biology
Chemistry, BA or BS 115
  General Chemistry
  Chemical Science
Computer Science, BA or BS 118
Cytotechnology, BA or BS 96
Dance, BA or BS 134
Economics, BA or BS 121
English, BA 124
General or Area Studies 98
  Humanities, BA
  Life Science, BA or BS
  Physical Science, BA or BS
  Social Science, BA or BS
Geography, BA or BS 122
Geology, BA or BS 131
Health, BA or BS 134
History, BA or BS 141
Journalism & Mass Communications, BA or BS 148
  Journalism & Mass Communications (Print)
  Radio-Television
Mathematics, BA or BS 151
Medical Technology, BS 97
Modern Languages, BA 157
Music 163
  Music, BA
  Applied Music, BM
  Music Education, BS in Music Education
Philosophy, BA or BS 170
Physical Education, BA or BS 134
Physics, BA or BS 171
Political Science, BA or BS 175
Pre-Dentistry, BA or BS 97
Pre-Law, BA or BS 97
Pre-Medicine, BA or BS 97
Pre-Nursing (non-degree) 98
Pre-Optometry (non-degree) 98
Pre-Pharmacy (non-degree) 98
Pre-Physical Therapy (non-degree) 98
Pre-Veterinary Medicine (non-degree)[1] 98
Psychology, BA or BS 179

Recreation, BA or BS 134
Social Work, BA or BS 183
Sociology, BA or BS 183
General Sociology
Correctional Administration
Speech, BA or BS 190
General Speech
Speech Pathology-Audiology
Statistics, BA or BS 196

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:

South Asia Studies 99
Women's Studies 43

1. 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.

Teacher Certification

Students working toward an undergraduate degree may, if they wish teacher certification for secondary schools, fulfill requirements for a major in most departments in the College of Arts and Sciences and teacher certification requirements in the College of Education. In either instance, the student will have an adviser in both colleges.

Pre-Business Career Preparation

Students who wish to seek the Masters of Business Administration degree may prepare to do so with an undergraduate major in Arts and Sciences. To be considered for admissions, graduate colleges of business or management encourage a broad, liberal- arts background and require the courses listed below. With appropriate planning, these courses may be taken as a part of the general education and elective requirements of the bachelor's degree.

General Education:

Select the first two or the third course:

285 350	Business and Economic Statistics I	3
285 351	Business and Economic Statistics II	3
or		
285 702	Statistical Methods for Social Science	3

Select one:

245 220	Analytical Geometry and Calculus I	4
or		
245 500	Introduction to Analytic Processes	3
286 200	Fundamentals of Computer Programming	2

Select one:

286 201	FORTRAN Language Laboratory	1
or		
286 202	PL/1 Language Laboratory	1
225 110	Economics I	3
225 120	Economics II	3

Electives:

305 260	Fundamentals of Accounting	4
305 390	Business Law I	3
305 420	Management Concepts	3
305 421	Production/Operations Management	3
305 440	Marketing	3
305 450	Business Finance	3
305 695	Business Policy	3

Honors Program

The honors program is a special program for the intellectually able and motivated student. It is designed to challenge such students in a wide range of academic areas, and to allow them to do a fair portion of their undergraduate work with other honors students. Above all, the honors program allows students to do deeper and broader work in a number of courses which are designated as honors courses. It also affords them opportunities to meet with distinguished guests on the campus and with Kansas State University faculty in informal settings and to participate in various field experiences in connection with their course work in the honors program.

Admission to the honors program may be gained toward the end of the freshman year. It requires completion of a non-credit seminar, "Introduction to Honors Work in the College of 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. Students who satisfy these requirements may meet individually with the director of the honors program and petition to join. Once admitted, students must maintain an overall grade point average of 3.3.

Students accepted into the honors program are expected to take four honors-level courses in any departments where such courses are offered. These are either honors sections or honors sub-sections of regular course offerings in those departments. Other requirements of the program are: two sophomore-level seminars to be selected from a group offered during each semester of the regular academic year, one in social sciences or humanities and one in mathematics or natural sciences; an interdisciplinary colloquium during the junior year; and an independent study during the senior year under the supervision of a faculty member of the student's choice. All courses in the honors program also serve to meet general education requirements for the undergraduate degree. The senior study culminates in a senior honors thesis or other documentation of performance, which is filed with the director for examination by other students and faculty, as needed. Honors students are encouraged to complete a four-course sequence in a modern language other than English. Members of the honors program register their membership each semester by pulling a course card, 200-010.

As students move through the honors program, their work becomes increasingly challenging and rewarding. The program offers stimulating and personalized academic experience for highly motivated students throughout the College of Arts and Sciences. For more information, please contact: Director, Honors Program, College of Arts and Sciences, Kansas State University, Manhattan, Kansas 66506.

200 010. 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 4-6 times at beginning of the semester. 200-010-0-4900.

200 399. 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 in Arts and Sciences, and two honors program sophomore seminars. 200-399-0-4900.

Study Abroad

Students interested in studying abroad during their college years will learn about many possibilities to meet this interest from the study-abroad adviser. Sponsored by the College of Arts and Sciences, the study-abroad office serves all members of the University, providing information about K-State academic programs abroad, the programs of other universities in which K-Staters may be interested (for credit or non-credit), employment opportunities in other countries, and scholarships or workshops for foreign study.

Independent Study

The college of Arts and Sciences offers all students an opportunity to undertake independent study and thereby to strengthen their capacity for independent judgement through the use of topics or problems courses in the various majors. These programs provide for independent reading and research in areas of general interest.

Scholarship Awards

Students throughout the University are encouraged to investigate several scholarships available for academic work beyond the bachelor's degree. Information about these awards is available in the office of the Dean of the College of Arts and Sciences and should be obtained early in the student's undergraduate work.

Available scholarships for which Kansas State University students have successfully competed include: **The Danforth Award**, which supports graduate study leading to a career in college teaching; **Fulbright-Hayes Study Grants** for academic study and research abroad; and the **Rhodes Scholarship**, which supports two or three years of graduate study at Oxford University.

In addition, students may wish to investigate the Kansas State University undergraduate exchange programs with Justus-Liebig University in Giessen, Germany and the **Harry S. Truman Award** to support the junior and senior year for students pursuing a career in government service.

Summer Independent Reading Program

Each summer the College of Arts and Sciences offers an opportunity for students to independently read six books during their summer holidays for two hours of academic credit. Each year two books are chosen in the humanities, two in the social sciences and two in the physical and biological sciences; the books chosen are all intelligible to the non-specialist, are usually current paperbacks, and are frequently controversial.

In the fall, having completed the books, students meet in three small two-hour seminars to discuss the books. Each seminar is moderated by a carefully selected faculty member. Following this, a written examination is given for each pair of books and the course then appears on the student's transcript of courses for the fall term. The course may be taken on a "credit-no credit" basis.

Students wishing to take the course should enroll in Arts and Sciences 200-199 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 adviser in the dean's office.

200 199. Summer Independent Reading Program. (2) 200-199-3-4901.

Pre-Professional Programs

A. Cytotechnology Curriculum:

Pre-Clinical Required Courses:

229 100	English Composition I	3
229 120	English Composition II	3
281 106	Oral Communications	2 or 3
261 101	Concepts in Physical Education	1

For a B.S. degree - 7 humanities and/or social sciences to include a philosophy course and two courses above the 500 level. (21)
For a B.A. degree - 3 humanities (one above 500) and 3 social sciences (one above 500) (18) and two years of foreign a language. (15)

245 100	College Algebra	3
245 150	Plane Trigonometry	4
221 210	Chemistry I	4
221 230	Chemistry II	4

Select one:

221 350	Gen Organic Chemistry	3
and		
221 352	Gen Organic Chemistry Lab	2
or		
211 120	Intro Organic Biochemistry	5
215 198	Principles of Biology	4
215 201	Organismic Biology	5

Select One:

215 555	Microbiology	5
or		
215 220	Bacteriology and Man	3
215 240	Structures and Function of the Human Body	6
215 400	Human Genetics	3
215 440	Cellular and Developmental Biology	5
215 518	Histology	4
265 115	Descriptive Physics	4

Bachelor of Science - 4 hours electives ..... 90 hours
Bachelor of Arts - no electives ..... 97 hours

Required Clinical Courses at St. Francis Hospital, School of Cytotechnology, Wichita, Kansas:

Introduction to Histology and Pathology (3) I. Lectures and demonstrations in basic histology and pathology of anatomical systems studied in diagnostic cytology.
Diagnostic Cytology of Female Reproductive System (6) I. Microscopic study and diagnosis of benign and malignant cells found in smears and aspirations from female genital tract.
Diagnostic Cytology of Respiratory System (5) I. Microscopic study and diagnosis of benign and malignant cells in sputum and bronchial washings.
Diagnostic Cytology of Effusions (2) II. Microscopic study and diagnosis of benign and malignant cells in pleural, peritoneal, pericardial and cerebrospinal fluids.
Diagnostic Cytology of Gastrointestinal System (2) II. Microscopic study and diagnosis of benign and malignant cells found in cytological specimens from mouth, esophagus, stomach, colon, and rectum.
Diagnostic Cytology of Urinary System (2) II. Microscopic study and diagnosis of benign and malignant cells found in urinary specimens.
Diagnostic Cytology of Breast and Other Miscellaneous Sites (2) II. Microscopic study and diagnosis of bengin and malignant cells found in breast secretions, joint fluids, skin, cysts, and other miscellaneous sites.
Methodology (5) S. Routine and special methods in collection and processing of specimens for cytology, cytogenetics, and histology.

B. Medical Technology Curriculum ·
1. Pre Clinical Courses: In addition to the general requirements of the College of Arts and Sciences, the following courses must be taken: College Algebra, Trigonometry, Chemistry I and II, General Organic Chemistry, General Biochemistry, Chemical Analysis, Descriptive Physics, Principles of Biology, Microbiology, Human Physiology, Genetics, Bacteriology of Human Diseases, Immunology, and Human Parasitology. Upon acceptance into and completion of a medical technology program, the student will receive a B.S. degree and will be eligible for professional certification. Students should consult with the medical technology adviser in the office of the Dean of Arts and Sciences.

2. Clinical Courses: The following courses are taken by students enrolled in a clinical medical technology program as a part of the medical technology degree program. These courses are not offered on the Kansas State University campus, but they are by affiliation agreement required for the major in Medical Technology.

200 401. Clinical Microbiology (6-8) II. The theory and laboratory study of pathogenic bacteria, viruses, richettsiae, fungi and parasites. Includes morphology, physiology, taxonomy and medical significance. 200-401-2-1223
200 402. Clinical Chemistry (6-8) I. Theory and laboratory study of analytical biochemistry, incorporating both routine and special chemical procedures. 200-402-2-1223
200 403. Clinical Hematology (4-6) S. Study of blood cell derivation, maturation and function, principles of hemastasis and blood coagulation. Methodology used in routine and special hematology studies. 200-403-2-1223
200 404. Clinical Immunology (2-6) I. Includes 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. 200-404-2-1223
200 405. Topics in Medical Technology (3-6) II. Includes basic principles and practices of the medical laboratory, techniques and special projects. 200-405-2-1223

C. Pre-Dentistry Curriculum: Students who wish to enter a dental school at the end of the junior year or after graduation should fulfill general requirements for the B.A. degree (page 101) or the B.S. degree (page 101) except the natural sciences. The following courses are to be used to satisfy the natural sciences and major requirements: Chemistry I and II, General Organic Chemistry and Laboratory or Organic Chemistry I and II, College Algebra, Plane Trigonometry, General Physics I and II, Principles of Biology and Organismic Biology, and eight hours of biology courses (excluding Problems and Practicum) above the 400 level. (One year's work [30 hours] will be granted toward the degree for completion of the first year at dental school for students who enter dental school at the end of their junior year.) Students should consul with the pre-dentistry adviser in the office of the Dean of Arts and Sciences.

200 040. Orientation to the Dental Profession (1) I,II. An introduction to the field of dentistry including dental specialties, equipment, diseases, and treatments. Students will make presentations. Pr.: Sophomore standing, permission of pre-dentistry adviser. 200-040-2-1205
200 240. Practicum in pre-dentistry (1) I, II, S. Forty hours is spent observing the practice of dentistry at Fort Riley Dental Clinic. Students are under the supervision and direction of individual dentists. Pr.: 200-040 (or concurrently), sophomore standing, permission of the pre-dentistry adviser. 200-240-2-1205

D. Pre-Law Curriculum: While the Association of American Law Schools considers the suggestion of particular courses for a pre-law curriculum unwise, it does provide certain guidelines for the attainment of general qualities needed for legal education: 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 the above capacities is a highly individualized process vigorously pursued in a variety of disciplines and degrees. Students should consult with the pre-law adviser in the office of the Dean of Arts and Sciences.

E. Pre-Medicine Curriculum: Fulfill General Requirements for the B.A. (page 101) or B.S. degree (page 101) except the natural sciences. The following courses are to be used to satisfy the natural sciences and major requirements: Calculus, Plane

Trigonometry, General Physics I and II, Chemistry I and II, Chemical Analysis, Organic Chemistry I and II, Organic Chemistry Laboratory I and II, Principles of Biology, Genetics and Embryology or equivalent. For additional information consult the pre-medical adviser in the office of the Dean of Arts and Sciences.

F. Pre-Nursing Program: Students can enter the pre-nursing curriculum and 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 credits), as prescribed by the university granting the degree, are required. For students transferring to a diploma program, 28-30 credits usually are required. The pre- nursing adviser will assist students in selecting appropriate courses, advising them regarding the different kinds of nursing education.

200 094. Introduction to Nursing (0) II. Designed for pre-nursing students considering professional nursing. Surveys the roles of the nurse, trends in nursing and how nursing care is delivered. Pr.: Permission of Instructor. 200-094-2-1203

200 202. Practicum in Nursing (2). Interim semester only. For students considering professional nursing as a career. Introduction to development of nursing care skills. Lecture Laboratory and clinical experience. 200-202-2-1203

G. Pre-Optometry Curriculum: Students wishing to enter a school of optometry at the end of the junior year should fulfill the general requirements for the Bachelor of Science or Bachelor of Arts degree and the required courses for admission to a school of optometry. Students should consult with the pre-optometry adviser in the office of the Dean of Arts and Sciences.

H. Pre-Pharmacy Curriculum: Students wishing to be eligible to enter a school of pharmacy must complete a minimum of 64 hours including the following courses: English Composition I and II (6), Chemistry I and II (8), Organic Chemistry I and II (10), College Algebra (3), Plane Trigonometry (3), Analytical Geometry and Calculus (4), Principles of Biology (4), Organismic Biology (5), Structure and Function of Human Body (6), Microbiology (4), Descriptive Physics (4), and humanities and/or social sciences (9). Students should consult with the pre-pharmacy adviser in the office of the Dean of Arts and Sciences.

I. Pre-Physical Therapy Curriculum. To be eligible for a physical therapy degree program students should complete the following course requirements. English Composition I and II, and one additional English course, Oral Communications, General Psychology and one additional psychology course, 6 hours of humanities, College Algebra and Trigonometry, Chemistry I and II, General Physics I and II, Principles of Biology, Structure and Function of Human Body, Bacteriology and Man and enough electives to make a total of 65 credit hours. Students should consult with the pre-physical therapy adviser in the office of the Dean of Arts and Sciences.

J. Pre-Veterinary Curriculum:[1] Sixty-four semester hours are required for application to enter the College of Veterinary Medicine. Pre-veterinary students will fulfill general requirements for the B.S. degree including English Composition I and II, Oral Communication, 12 hours of social sciences and humanities. For the natural science requirements the following courses should be used: College Algebra and Plane Trigonometry, Chemistry I and II, General Organic Chemistry and Laboratory, Chemical Analysis, General Physics I and II, Principles of Biology, Genetics or Heredity and Evolution. Animal science course requirements may be satisfied by completing Principles of Animal Science as well as Animal Sciences and Industry, Dairy Science, and Poultry Science laboratories. Upon satisfactory completion of these courses and those of the first two years in veterinary medicine, the student will be eligible for a Bachelor of Science degree through the College of Arts and Sciences. Students should consult the pre-veterinary advisers in the office of the Dean of Arts and Sciences.

SUGGESTED SCHEDULE OF PRE-VETERINARY MEDICINE REQUIREMENTS

Fall Semester	
English Composition I	3
College Algebra	3
Chemistry I	4
social science elective or Principles of Animal Science	3
Oral Communication I	2
Concepts in Phys. Ed	1
	16
Spring Semester	
English Composition II	3
Chemistry II	4
Principles of Biology	4
Plane Trigonometry	3
social science elective or Principles of Animal Science	3
	18
Fall Semester	
Chemical Analysis	4
Heredity and Evolution or Genetics	2 or 3
General Physics I	4
social science elective or Principles of Animal Science	3
Animal Husbandry	1
Dairy or Poultry Science	1
	15 or 16
Spring Semester	
General Physics II	4
humanities electives	6
Dairy or Poultry Science	1
General Organic Chemistry	5
	16

64 semester hours required for admission to College of Veterinary Medicine.

1. Pre-veterinary requirements should be completed in the College of Agriculture if a student's second major is in that college. If the second major is in Arts and Sciences, the requirements should be completed there.

Interdisciplinary General Studies

Those students who, for a number of very good reasons, have not chosen a particular field of study and do not want to choose one as an undergraduate should consider the general or area studies program.

Despite the pressure to choose one particular field over all others, there is growing recongition that the important problems of our world are not single-discipline problems.

There is, however, some need for students to focus their thoughts and develop their talents in one of four broad areas. Those areas are listed and defined below along with the requirements which must be fulfilled for the B.A. or B.S. degrees.

Life Science is a branch of science which deals with living organisms and life processes. It includes such disciplines as anthropology, biology and sociology. The courses required are Bacteriology and Man, General Entomology, Principles of Biology, Organismic Biology, and at least three different courses from the fields of biology, microbiology, entomology or psychology, two of which must be above the introductory level. Thirty hours in life sciences is required.

Humanities are the branches of learning primarily having a cultural character. The requirements for this study are 15 hours in each of two humanities departments (art, dance, English, history, modern languages, music, philosophy, speech) with at least one upper level course in each of two departments; and 9 hours of the general requirements for the bachelor of arts degree must be in a third humanities department. Thirty hours is required for this program, and the B.A. degree only is offered.

Physical Science deals primarily with non- living materials. The courses required are Chemistry I and II, Geology I or Oceanography and Geology I Lab, Plane Trigonometry and General Physics I and II. In addition, at least three courses must be taken from two or more of the following fields: chemistry, computer science, geology, mathematics and physics. At least two of these three courses must be above the introductory level, and 34 hours must be completed in this area.

Social Science is a science dealing with a particular phase or aspect of human society. The requirements are one course in each of four of the following areas: anthropology, economics, geography, sociology, history, political science and psychology. In addition, at least six courses must be taken from two or more of the following fields: anthropology, economics, geography, political science, history, psychology and sociology. At least four courses must be above the introductory level, and 30 hours is required.

South Asia Language And Area Studies

The South Asia center is an interdisciplinary language and area center focusing the course offerings of several departments on this important world area with whose development Kansas State University programs have been concerned for more than a decade. South Asia, as a linguistic and cultural area, includes Afghanistan, Bangladesh, Pakistan, India, Nepal, Sri Lanka, Bhutan, and the Maldive Republic.

The KSU South Asia program was recognized in 1967 as a National Defense Education Act Language and Area Studies Center. More recently, the center has received a grant from the National Endowment for the Humanities to conduct a project developing South Asian Studies in elementary and secondary schools of Colorado, Kansas, Nebraska and Oklahoma.

The basic South Asia courses at KSU are the Introduction to South Asian Civilizations I and II, taught jointly by South Asian faculty from the Departments of History; Political Science; Sociology, Anthropology, and Social Work; and Economics. Thses courses may be taken by any undergraduate and credit may be received in any one of the participating departments. Advanced courses in South Asia and related subjects are taught in all of these departments. 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 demand, in other South Asian languages and in Arabic. 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 can earn a secondary major in South Asian studies. This secondary major is open to any student at Kansas State University. A student receives, along with his primary major, a broad, interdisciplinary education concerning the Indian sub-continent, whose people constitute twenty 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 who choose the secondary major graduate with dual competencies. They are prepared for graduate work which focuses specifically on South Asia or can leave Kansas State with a unique background for careers in international business, trade, or agriculture; foreign service; journalism; primary and secondary teaching and librarianship; or foreign aid and cooperation.

This 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, and it is its 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 acts as advisers 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 adviser.

Course requirements for the secondary major in South Asian studies:

Secondary Major

I. **Language Requirement:** the first two years of Hindi/Urdu or equivalent competency in a South Asian language.

253 171. Hindi/Urdu I
253 172. Hindi/Urdu II
253 273. Hindi/Urdu III
253 274. Hindi/Urdu IV

II. South Asian Civilizations: one course required.

xxx 505. South Asian Civilizations I
xxx 506. South Asian Civilizations II
(Cross-listed in the five participating disciplines: Anthropology, Economics, History, Poliitical Science, and Sociology.)

III. Area Courses: required: four of the courses listed below in three fields, of which no more than two can be in the discipline major.

Agricultural Economics

010 615. International Agricultural Development

Anthropology

278 645. Cultures of India and Pakistan

Economics

225 636. Comparative Economic Systems
225 682. Development Economics
225 699. Seminar in Economics: South Asia

History

241 701. South Asian History I
241 702. South Asian History II
241 707. Topics in Non-Western History

Modern Languages

253 509. Religious Literature of South Asia
253 582. Languages in South Asia

Political Science

269 723. South Asian Political Systems
269 752. International Politics of South Asia

Sociology

277 742. South Asian Social Systems

Graduate Work

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.

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.

Summer Institute

The center's project to develop South Asian studies in the elementary and secondary school systems of the states of Kansas, Nebraska, Colorado and Oklahoma is a nationally significant experiment in educational diffusion. It combines the area expertise of South Asian specialists with the classroom experience of practicing teachers to produce units on South Asia which are introduced into the teachers' own courses. The core of the project is a three-week summer institute at Kansas State University in which teachers learn about South Asia and prepare their teaching units, using resources, materials, and advice from the center. During the academic year, the center supports the implementation of the teaching units by evaluating and supplying audio-visual and other materials. Teachers are eligible to earn a maximum of six hours of graduate credit for the summer institute. Interested teachers and school administrators are invited to write or telephone the center for additional information.

For further information on South Asian studies contact the director, South Asia Center, Kansas State University, Manhattan, KS 66506 or telephone 913-532-5738.

Linguistics

The departments of English, Modern Languages and Speech cooperate in an interdepartmental linguistics program that offers cross-listed courses of study leading to the B.A. and M.A. degrees. Students identify themselves with the department most suiting their academic background and interests. The program's offerings also provide an opportunity for students in any discipline to gain an appreciation of the rich structure of human languages and an understanding of linguistics as it may relate to education, psychology, foreign language study, philosophy, literature, speech pathology, audiology, and so forth.

Undergraduates in either modern languages or speech may work toward a B.A. degree with emphasis in linguistics. Graduates in English, modern languages or speeech may choose linguistics for emphasis in their M.A. degree. For both undergraduates and graduates, the program's core courses attempt to provide a solid foundation in modern theoretical linguistics, in particular the linguistics of the "Chomskyan revolution." The student would be wise, however, to pursue (with adviser's approval) as many non-core linguistics-related courses as possible in the various departments that offer them, so as to avoid too narrow a view of the field. (See course listings in anthropology, computer science, English, general speech, modern languages, philosophy, psychology, and speech pathology and audiology.)

General admission requirements for undergraduates will be found beginning on page 94. Students seeking graduate admission should hold a bachelor's degree and have at least 12 semester hours, or equivalent, beyond the introductory level in a single foreign language (or in English, for non- native speakers of English). Graduates write either a report (two credit hours) or a thesis (six credit hours), with course work bringing the total to at least 30 credit hours.

For further information about undergraduate or graduate study in linguistics, including a list of available courses, contact the participating departments or the linguistics adviser, Leasure Hall 110, phone 532-6880.

Transfer Students

General requirements for transfer to Kansas State University appear on page 6. Where specific departmental requirements exist, they may be found within the department section.

General Education Requirements

Requirements in general education are to be fulfilled by courses chosen by students in consultation with their advisers. 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 the areas of natural sciences, social sciences, and humanities.

Only courses of two or more credit hours can fulfill general requirements. No more than three courses in history can be used to fulfill the requirements for humanities or social sciences. Credit for intermediate algebra may not be applied toward a degree.

Bachelor of Arts Degree

120 hours required for graduation

I. General Requirements

A. English Composition I and II
B. Oral Communication I (or Oral Communication II, Argumentation and Debate, or Public Speaking as recommended by Department of Speech).
C. modern languages
Two years in 1 language (or equivalent competence)
D. mathematics—One course
E. humanities—Three courses, including one course above the introductory level (500 level or above) from departments of art, english, history, modern languages, music, philosophy, and speech.
F. social science—Three courses, including one course above the introductory level (500 level or above) in anthropology, economics, geography (excluding geography 220 and 420), history, political science, psychology, sociology, journalism and mass communications.
G. natural science—Four courses, including one laboratory course and one course above the introductory level (a course which has a prerequisite in the same department in which it is located) in biology, biochemistry, chemistry, computer science, geography (courses 220 and 420 only), geology, mathematics, physics, or statistics.
H. physical education—Concepts of Physical Education is required of freshmen.

II. Major Requirements: Remaining hours in major and additional tool and related courses and electives.

Pre-professional programs are administered by the appropriate department or, where not applicable, by the office of the Dean of Arts and Sciences.

Bachelor of Science Degree

120 hours required for graduation

I. General Requirements

A. English Composition I and II
B. Oral Communication I (or Oral Communication II, Argumentation and Debate, or Public Speaking as recommended by Department of Speech).
C. humanities and social sciences—Seven courses, taken from at last two departments, including one course in philosophy and two advanced level courses (500 level or above or second year of a foreign language) in anthropology,art, economics, english, geography (excluding Geography 220 and 420), history, modern languages, music, philosophy, political science, psychology, sociology, speech, journalism and mass communications.
D. natural science—Four courses, including one laboratory course and one course above the introductory level (a course which has a prerequisite in the same department in which it is located) in biology, biochemistry, chemistry, computer science, geography (courses 220 and 420 only), geology, mathematics, physics or statistics.
E. physical education—Concepts of Physical Education is required of freshmen.

II. Major Requirements: Remaining hours in major and additional tool and related courses and electives.

Pre-professional programs are administered by the appropriate department or, where not applicable, by the office of the Dean of Arts and Sciences.

Bachelor of Fine Arts

120 hours required for graduation

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 or artist-teachers. 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. The BFA in art is a 4-year 120-hour program with majors possible in painting, sculpture, ceramics, graphic design and printmaking. The degree requirements are as follows:

I. General Education (45 hours)

A. communications: English Composition, 2 courses; and Oral Communication I, 1 course.
B. social science (2 courses)
C. humanities (3 courses)
D. philosophy or mathematics (1 course)
E. natural sciences (2 courses, one with a lab)
F. general electives (11-19 hours)
G. physical education: concepts, 1 hour

II. Art Courses (75 hours)

A. core (39 hours)
B. major (20 hours)
C. art electives and related courses (16 hours)

Bachelor of Music Degree

128 hours required for graduation

Majors offered in this curriculum are: applied instruments, voice, theory, and composition. An applied minor also is required.

I. General Requirements (42 hours)

A. English Composition I and II
B. Oral Communication I or Ia
C. physical education: Concepts

D. Physics for Musicians
E. General Psychology
F. non-music courses, 9 to 19 hours
G. modern language, 8 to 20 hours

II. The remaining hours to be taken in major, additional tool and related courses, as well as electives in music. For specific music requirements, see catalog statement for the Department of Music, page 163.

Bachelor of Science In Music Education Degree

128 hours required for graduation

The Bachelor of Science in Music Education is intended for those who plan to teach vocal or instrumental music on the elementary and secondary levels of the public schools. It also prepares one for graduate work in the field of music education.

I. General Education
A. English Composition I and II
B. Oral Communication I or Ia
C. literature or language—6 hours
D. social science—12 hours (including General Psychology)
E. natural science—12 hours (including Physics for Musicians and at least one biological science)
F. humanities electives as needed for degree and certification

II. Professional Education
A. Educational Psychology I and II, 6 hours
B. music education professional semester (includes student teaching, and other required courses from the College of Education.)

III. Physical Education: Concepts of Physical Education, 1 semester

IV. The remaining hours to be taken in major, additional tool and related courses and electives:

Music 175, 176, 214, 215, 406, 407, 416, 503, 504, 505 (comprehensive musicianship courses); Music 232, 233, 234, 235 (applied music); Music 412, 413, 512 (music education); vocal music majors include Music 513 (music education); instrumental majors include two of the following (depending on specific major), Music 427, 428, 429 (applied music) and Music 514 (music education). Vocal majors are required to have four hours of applied keyboard and four hours of singer's diction as a minor. Instrumental majors complete four additional hours of applied music, of which two hours of voice class are required, as well as a minimum of two hours in piano class. Both vocal and instrumental majors are required to pass piano proficiency before admission to student teaching. Participation in at least one major musical organization in the major applied area is required during each semester until graduation. A maximum of eight semester hours for this participation is allowed toward degree requirement. Recital attendance is required each semester of the program.

Associate of Arts Degree

Sixty hours including the following General Requirements:

A. English Composition I and II
B. Oral Communication I (or Oral Communication II, Argumentation and Debate, or Public Speaking as recommended by Department of Speech). One course
C. modern languages. Two years in one language (or equivalent competence)
D. mathematics. One course (credit for Intermediate Algebra may not apply toward a degree.)
E. humanities (art, dance, English, history, modern languages, music, philosophy and speech). Three courses. No more than three courses in history to fulfill E and F.
F. social sciences (anthropology, economics, geography, excluding Geography 220 and 420, history, political science, psychology, sociology, social work, Journalism and Mass Communications). Three courses, including one course above the introductory level. No more than three courses in history to fulfill E and F.
G. natural science (biochemistry, biology, chemistry, computer science, geography, courses 220 and 420 only, geology, mathematics, physics or statistics). Four courses including one laboratory course above the introductory level (a course which has a prerequisite in the same department in which it is located).
H. physical education: Concepts of Physical Education

Associate in Science

Sixty hours including the following General Requirements:

A. English Composition I and II
B. Oral Communication I (or Oral Communication II, Argumentation and Debate, or Public Speaking as recommended by Department of Speech).
C. humanities and social sciences (anthropology, art, economics, English, geography [excluding Geography 220 and 420], history, modern languages, music, philosophy, political science, psychology, sociology, social work, speech, journalism and mass communications). Seven courses, taken from at least two departments including one course in philosophy.
D. natural science (biology, biochemistry, chemistry, computer science, geography, [courses 220 and 420 only], geology, mathematics, physics, or statistics). Four courses, including one laboratory and one course above the introductory level (a course which has a prerequisite in the same department in which it is located).
E. physical education: Concepts of Physical Education

Departments & Course Offerings

AEROSPACE STUDIES

Professor Barber; Associate Professor Grenier; Assistant Professor Dameron; Instructors Harris, Tomory and Wagner.

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 their university program they are commissioned second lieutenants, and either:

1. Enter into Air Force-sponsored graduate study at full pay while serving as Air Force officers, or

2. Are deferred for graduate study, to enter active service after completion for a specified period, or

3. Enter directly upon normal active service for a specified period, taking flying training or performing managerial, research or development tasks, or,

4. Enter the active or inactive Air Force Reserve.

Any student, graduate or undergraduate, who is a U.S. citizen may become a cadet. The duration of the program varies between two and four years, depending upon an applicant's previous experience and the availability of different options.

Students electing the four-year program normally will start the General Military Course (GMC) during their freshman or sophomore year. This program consists of one credit hour each semester, will count toward all bachelor's degrees awarded by KSU, and in no way obligates students to a military commitment. Students in the GMC are issued uniforms and all texts and other equipment needed for their AFROTC courses.

The uniform is furnished by the government. The money value of any missing articles will be collected when the uniform is returned. Failure to return or pay for missing articles of the uniform may result in witholding of credit and in extreme cases may cause the university to refuse a transcript or to graduate the student concerned.

Included in the course is the opportunity for each cadet to travel via military aircraft to various Air Force installations. KSU cadets have viewed space launches in Florida, seen the Air Force museum in Ohio, been instructed on navigator training in California, and witnessed pilot training in Arizona. These are but a few of the trips regularly scheduled to provide a personal look at the Air Force and the many challenges it presents.

The Professional Officers Course (POC) consists of four courses of three 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. Outstanding cadets, including freshmen and sophomores, may apply for an Air Force ROTC college scholarship and, if selected, will have their tuition, fees, and book allowance for all courses taken at Kansas State University paid for by the USAF, and will receive $100 monthly.

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, physically capable, possess leadership potential, and make application before December 15th of their senior year. Financial benefits are the same as mentioned in the preceding paragraph.

POC cadets practice their leadership and management skills in a cadet group. All POC cadets who are in a four-year program attend four weeks of field training, which is given in the summer at an Air Force base, prior to entering the POC. During training, they are paid approximately $300, and receive travel pay to and from their training base.

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, Air Force physical, and completion of six weeks summer field training. Applicants must contact the Department of Aerospace Studies during the spring semester prior to fall semester entry. A limited number of scholarships are available for two-year students who are still undergraduates.

For those cadets who plan to become Air Force pilots, AFROTC offers the Flight Instruction Program (FIP). This is taken within 12 months of graduation, is free, and may lead to a private pilot's license. A one-semester one-credit-hour course provides ground instruction in flight theory and practice for those cadets who plan to become Air Force pilots or navigators. Cadets who have a private pilot's license are not eligible to receive free flight instruction.

General Military Courses

Undergraduate Credit

205 113. 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. 205-113-0-1803

205 114. Aerospace Studies 1B. (1) II. U.S. strategic offensive and defensive forces; their mission, function; effect and employment of nuclear weapons. One hour of class plus one hour of leadership training a week. 205-114-0-1803

205 210. 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. 205-210-0-1803

205 211. 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 those elements that provide significant examples of the impact of air power on strategic thought. One hour of class plus one hour of leadership training a week. 205-211-0-1803

Professional Officers Courses

Undergraduate Credit

205 310. 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. 205-310-0-1803

205 311. The Professional Officer 3B. (3) II. Continuation of AS 310. Three hours of class plus one hour of leadership training a week. 205-311-0-1803

205 380. Weather and Navigation. (1) II. Introduction to weather and navigation. Equivalent to that required for a private pilot's license. Required of AFROTC cadets enrolled in category 1P or 1N during their final year of Aerospace Studies. Pr.: 205-210 or 205-211. Prerequisite may be taken prior to or concurrently with Wea/Nav. Special student status authorized when approved by department head. 205-380-2-1803

205 381. 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. 205-381-3-1803

205 399. 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. 205-399-3-1803

205 400. 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 national defense structure; and the impact of technological and international developments upon strategic preparedness and the overall defense policy-making process. Three hours of class plus one hour of leadership training a week. 205-400-0-1803

205 401. 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 defens 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. 205-401-0-1803

ART

Jerrold Maddox, Head of Department*

Professors Garzio,* Larmer,* and Maddox;* Associate Professors Rex Replogle,* Pujol,* Woodward,* and Vogt;* Assistant Professors Clore, Culley, Howes, Kuronen, Lacher, Love, Marks,* Munce,* Noblett, O'Shea,* Schmidt, Sturr,* Swiler, and Winegardner; Instructors Dollar, Kren, and Renata Replogle; Assistant Instructor Hagan; Emeritus: Professor Barfoot; Associate Professors Harris and Hill; Assistant Professor Geiger.

Undergraduate Study

Bachelor of Art. The B.A. degree in art consists of three parts: (1) the general education as outlined under the humanities curriculum, (2) a core of beginning art courses to provide prerequisites and a broad range of art experience for the art major, and (3) 16 hours concentration of related subjects which should provide a minimal basis for establishing professional competence. Some of the concentration possibilities will be in one of the following media: painting, printmaking, ceramics, sculpture, drawing, art history, metalsmithing and jewelry, and graphic design. Bachelor of Art Degree requires a minimum of 48 semester hours in art.

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 or artist-teachers. 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. The B.F.A. in art is a four-year 120-hour program with majors possible in painting, sculpture, ceramics, graphic design, printmaking, drawing, metalsmithing-jewelry. The degree requirements are as follows:

I. General Education (45 hours)
(1) communications: English composition (2 courses) and Oral Communication I (1 course)
(2) social science (2 courses)
(3) humanities (3 courses)
(4) philosophy or mathematics (1 course)
(5) natural sciences (2 courses, one with lab)
(6) general electives (11-19 hours)
(7) physical education: Concepts in Physical Education

II. Art Courses (75 hours)
(1) core (39 hours)
(2) major (20 hours)
(3) art electives and related courses (16 hours)

Art Education. Students may satisfy requirements to teach art in public schools by any of three programs: (1) B.A. and teacher certification, (2) B.F.A. and teacher certification or (3) 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. Art students may enroll in Introduction to Civilization of South Asia, as a humanities requirement.

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.

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 the fields of drawing, painting, sculpture, ceramics, 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 degree Master of Fine Arts include a minimum of 60 semester hours, approximately two-thirds of which will be in the field of concentration. The candidate will be encouraged to take 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 and analysis of that work.

Courses in Art

Undergraduate Credit

209 095. Art Assembly. (0) I, II. Required for all art and art education majors each semester. By appt. 209-095-2-0831

209 096. Art Education Seminar. (0) I, II. Required each semester for all students majoring in art who plan to participate in the teaching block; an introduction to the attitudes of professional growth in art that will create a relationship between their fine arts training and their teaching experience. 209-096-2-0831

209 100. Design I. (2) I, II, S. Introduction to and laboratory practice in the principles and elements of design. Four hours lab. 209-100-1-1002

209 170. Art for Elementary Schools. (3) I, II, S. Art methods, materials, and philosophy of children's art at different grade levels. 209-170-1-0-0831

209 190. Drawing I. (2) I, II, S. Fundamentals of drawing as applied to the realistic and expressive representation of objects through the use of a variety of media and approaches. Four hours lab. 209-190-1-0-1002

209 195. Survey of Art History I. (3) I, S. Historical development of art from Pre-History through the Middle Ages. 209-195-0-1003

209 196. Survey of Art History II. (3) II, S. Historical development of art from the Renaissance through the nineteenth century. 209-196-0-1003

209 200. Design II. (2) I, II, S. Further work in the principles and elements of design, with emphasis on color, texture, and pictorial composition. Four hours lab. Pr.: Art 100. 209-200-1-0-1002

209 205. Graphic Design Techniques. (2) I, II, S. 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. 209-205-1-0-1002

209 210. Drawing II. (2) I, II, S. Cont. of Drawing I, with strong emphasis on creative expression. Four hours lab. Pr.: Art 100, 190. 209-210-1-0-1002

209 215. 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. 209-215-1-0-1002

209 220. Water Color I. (2) I, II, S. Painting in water color and other water-soluable media; includes both studio and outdoor painting and sketching. Four hours lab. Pr.: Art 100, 190. 209-220-1-0-1002

209 225. Figure Drawing I. (2) I, II, S. Sustained drawings of the human figure using a variety of media; introduction to human anatomy used by artists. Four hours lab. Pr.: Art 210. 209-225-1-0-1002

209 230. Sculpture I. (2) I, II, S. 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. 209-230-1-0-1002

209 235. Printmaking I. (2) I, II, S. 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. 209-235-1-0-1002

209 240. Drawing III. (3) I, II. Cont. of Drawing II, emphasizing exploration in mixed media. Six hours lab. May be taken for two semesters. Pr.: Art 210. 209-680-1-0-1002

209 245. Painting I. (2) I, II, S. Introduction to painting through a variety of media and techniques. Four hours lab. Pr.: Art 100, 190. 209-245-1-0-1002

209 250. 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. 209-250-1-0-1002

209 255. 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. 209-255-1-0-1002

209 260. Design in the Crafts. (2) I, II, S. Crafts work in various media, with emphasis on contemporary design. Four hours lab. May be taken for credit two semesters. Pr.: Art 100. 209-260-1-0-1002

209 265. Ceramics I. (2) I, II, S. Introduction to basic hand building techniques and wheel throwing; 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 or consent of instructor. 209-265-1-0-1002

209 270. Metalsmithing and Jewelry. (2) I, II, S. 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 215. 209-270-1-0-1002

209 275. Weaving I. (2) I, II, S. 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. 209-275-1-0-1002

209 290. 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. 209-290-1-0-1002

209 310. Honors Seminar in Art. (1) II 1978. Selected topics in art. May be taken for credit more than once. Pr.: For students in the Honors Program only. 209-310-0-1002

209 420. History of South Asian Art. (3) I, II. A survey of the history of art in the South Asian sub-continent from its prehistoric origins to the height of the Mughal period in the 18th 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, Ceylon, Afghanistan, Indonesia and Indochina. 209-420-0-1003

209 430. Independent Study—Ceramics. (1-5) I, II, S. Work offered in ceramics after competency has been achieved. Personal development is emphasized. 209-430-3-1002

209 435. Independent Study—Crafts. (1-5) I, II, S. Work offered in crafts after competency has been achieved. Personal development is emphasized. 209-435-3-1002

209 440. Independent Study—Drawing. (1-5) I, II, S. Work offered in drawing after competency has been achieved. Personal development is emphasized. 209-440-3-1002

209 445. Independent Study—Graphic Design. (1-5) I, II, S. Work offered in graphic design after competency has been achieved. Personal development is emphasized. 209-445-3-1002

209 450. Independent Study—Metalsmithing and Jewelry. (1-5) I, II, S. Work offered in metalsmithing and jewelry after competency has been achieved. Personal development is emphasized. 209-450-3-1002

209 455. Independent Study—Painting. (1-5) I, II, S. Work offered in painting after competency has been achieved. Personal development is emphasized. 209-455-3-1002

209 460. Independent Study—Printmaking. (1-5) I, II, S. Work offered in printmaking after competency has been achieved. Personal development is emphasized. 209-460-3-1002

209 465. Independent Study—Sculpture. (1-5) I, II, S. Work offered in sculpture after competency has been achieved. Personal development is emphasized. 209-465-3-1002

209 470. Independent Study—Water Color. (1-5) I, II, S. Work offered in water color after competency has been achieved. Personal development is emphasized. 209-470-3-1002

Undergraduate And Graduate Credit In Minor Field

209 505. Greek Art History. (3) I, II, S. Study of the art of classical Greece, from its Aegean origins through the Hellenistic period. Pr.: Art 195, 196. 209-505-0-1003

209 510. Italian Renaissance Art History. (3) I, II. Italian art of the 15th and 16th centuries, with a brief discussion of the 14th century origins of Renaissance art. Pr.: Art 195, 196. 209-510-0-1003

209 515. Northern Renaissance Art History. (3) I, II. A study of the art of Northern Europe in the 14th, 15th and 16th centuries, including the International Style, and painting of Flanders, Germany, and France. Pr.: Art 195, 196. 209-515-0-1003

209 520. Southern Baroque Art History. (3) I, II, S. The development of the Baroque period in Italy, Spain and France, from its beginnings in the 17th century to Tiepolo and the Rococo style of the 18th century. Pr.: Art 195, 196. 209-520-0-1003

209 525. Northern Baroque Art History. (3). The development of the Baroque in Holland and Flanders. Pr.: Art 195, 196. 209-525-0-1003

209 530. The Development of American Art. (3) I, II, S. A study of American art from the Colonial period to the beginnings of Abstract Expressionism in the early 1940s, with major emphasis on the late 19th and early 20th century developments. Pr.: Art 195, 196. 209-530-0-1003

209 535. History of Modern Sculpture. (3) I, II, S. An in-depth study of the various directions taken by modern sculptors since the time of Rodin. Pr.: Art 195, 196. 209-535-0-1003

209 540. Nineteenth Century Art History. (3) I, II. Painting, sculpture and architecture of the late 18th and 19th centuries, with emphasis on the art of France. Pr.: Art 196. 209-540-0-1003

209 545. Twentieth Century Art History I. (3) I. Origins and development of twentieth century art from 1890 to 1914. Pr.: Art 195, 196. 209-545-0-1003

209 550. Twentieth Century Art History II. (3) II. Origins and development of twentieth century art from 1914 to the present. Pr.: Art 195, 196, 545. 209-550-0-1003

209 555. Ceramic Kilns (2) II. A study of the principles in designing, and the construction and operation of up-draft, down-draft and cross-draft kilns, single and multiple chamber varieties, using various kinds of fuels. Pr.: Art 265 or consent of the instructor. 209-555-1-0-1002

209 560. Art for Exceptional Children. (3) I, II. A study of the knowledge and methods of utilizing art concepts and art activities by the elementary teacher to develop and enhance the learning experiences of exceptional children, including the disadvantaged, physically handicapped, mentally retarded and emotionally disturbed. Six hours lab. Pr.: Elementary Education or Art major and Psychology 110. Same as Educ. 560. 209-560-1-0-0831

209 565. 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. 209-565-1-0-1002

209 570. Painting II. (3) I, II, S. Continuation of Painting I. Nine hours lab. Pr.: Art 245. 209-570-1-0-1002

209 575. 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. 209-575-1-0-1002

209 580. Women in Art. (3) I, II, S. The work of women artists from early Middle Ages to the twentieth century, with emphasis on the contemporary period. Pr.: Sophomore standing and consent of instructor. 209-580-0-1003

209 585. Crafts for Children. (3) I, II, S. Studio experiences in crafts related to elementary school age children. Emphasis will be directed toward creative development with craft materials and processes. Pr.: Art 170 and consent of instructor. 209-585-1-0-1002

209 590. Southwestern Indian Arts and Culture. (3) I, II, S. The development of Southwestern Indian silver-smithing, weaving, pottery, basketry and painting form the prehistoric period to the twentienth century. Pr.: Sophomore standing. 209-590-0-1003

Undergraduate And Graduate Credit

209 600. Advanced Drawing. (3-5) (Credits over three hours must be approved by the instructor.) I, II, S. 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. 209-600-1-0-1002

209 610. Figure Drawing II. (3) I, II, S. Continuation of Figure Drawing I, with emphasis on individual expression. Six hours lab. May be taken for four semesters. Pr.: Art 225. 209-610-1-0-1002

209 615. 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. 209-615-1-0-1002

209 620. Water Color II. (3) I, II, S. Cont. of Water Color I. Emphasis on individual expression within limitations of medium. Six hours lab. May be taken for two semesters. Pr.: Art 220. 209-620-1-0-1002

209 625. 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. 209-625-3-1002

209 630. Lithography. (3) I, II, S. Advanced work in lithography. Six hours lab. May be taken for 4 semesters. Pr.: 209-235 (emphasis on lithography). 209-630-1-0-1002

209 635. Printmaking II. (3) I, II, S. Advanced work in blockprints, serigraphy, lithography, and intaglio. Six hours lab. May be taken for four semesters. Pr.: Art 235. 209-635-1-0-1002

209 640. Etching and Drypoint. (3) I, II. Individual expression in intaglio techniques or printmaking; includes etching, engraving, aquatint, and drypoint. Six hours lab. May be taken for four semesters. Pr.: Art 235. 209-640-1-0-1002

209 645. Sculpture II. (3) I, II, S. 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. 209-645-1-0-1002

209 650. Painting III. (3-5) I, II, S. 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 and consent of instructor. 209-650-1-0-1002

209 655. Metalsmithing Techniques. (3) I, II, S. A variety of techniques will be explored. 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. 209-655-1-0-1002

209 660. Sculpture III. (3-5) I, II, S. 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. 209-660-1-0-1002

209 665. Ceramics III. (2) I, II. Clay and glaze analysis and calculations. Study of raw materials and their characteristics as used in clay and glaze formulations. One hour lec. and two hours lab. Pr.: Art 265. 209-665-1-0-1002

209 670. Ceramics IV. (2) I, II. Individual exploration and further development of ceramic design and glaze technology; advanced kiln design and construction. Four hours lab. May be taken for three semesters. Pr.: Art 565, 665. 209-670-1-0-1002

209 675. History of Ceramics. (2) 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 100 or 265. 209-675-0-1003

209 680. Metals Workshop. (3-5) I, II, S. A number of metalsmithing techniques will be explored by the upper division student. The emphasis will be placed 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 and consent of instructor. 209-680-1-0-1002

209 685. Advanced Independent Study - Design. (Var.) I, II, S. Advanced work in design-related subjects. Pr.: Full sequence of courses related to problem subject matter. 209-685-3-1002

209 690. Techniques in Teaching Art. (Var.) II, S. Lectures and class discussion of methods, consideration of suitable laboratory equipment, use of illustrative material, and preparation of courses of study. Pr.: Art 200, consent of instructor; 12 credit hours in Art. 209-690-0-0831

209 695. Topics in Art History. (Var.) I, II, S. Independent exploration in selected problems in art history. Pr.: Twelve hours art history. 209-695-3-1003

Graduate Credit

209 830. Graduate Sculpture Studies. (Var.) I, II, S. Advanced creative work involving appropriate sculptural media and related techniques. Emphasis placed on content of work. May be taken for a total of 18 credit hours. Pr.: Consent of instructor. 209-830-3-1002

209 835. Graduate Drawing Studies. (Var.) I, II, S. Advanced study with emphasis on original investigation leading to professional competence in drawing. May be taken for total of 20 hours. Pr.: Consent of instructor. 209-835-3-1002

209 840. Graduate Crafts Studies. (Var.) I, II, S. Advanced study with emphasis on original investigation leading to professional competence in crafts. May be taken for a total of 18 credit hours. Pr.: Graduate standing and Consent of instructor. 209-840-3-1002

209 845. Graduate Painting Studies. (Var.) I, II, S. Advanced study with emphasis on original investigation leading to professional competence in painting. May be taken for a total of 18 credit hours. Pr.: Consent of instructor. 209-845-3-1002

209 855. Graduate Printmaking Studies. (Var.) I, II. Advanced creative work in any of the printmaking areas. Emphasis on original investigation into technical aspects as well as content in prints media. May be taken for a total of 20 credit hours. Pr.: Consent of instructor. 209-855-3-1002

209 865. Graduate Ceramics Studies. (Var.) I, II. Further study of glaze experimentation; resolutions of advanced form and decoration problems established by instructor. May be taken for a total of 18 credit hours. Pr.: Art 670 or consent of instructor. 209-865-3-1002

209 885. Graduate Independent Study. (1-5) I, II, S. Advanced individual work offered in studio areas of ceramics, graphic design, drawing, painting, printmaking and sculpture. 209-885-3-1002

209 899. Research in Art. (Var.) I, II, S. Research which may form the basis for the master's thesis or report. Pr.: Graduate standing. 209-899-4-1002

BIOCHEMISTRY

David J. Cox, Head of Department*

Professors Burkhard,* Clegg,* Cox,* Hedgcoth,* Mitchell,* Nordin,* Parrish,* and Ruliffson;* Associate Professors Cunningham,* Klopfenstein,* Kramer,* Mueller,* Reeck,* and Roche;* Assistant Professors Davis.*

Biochemistry bridges the disciplines of biology and chemistry. A sound foundation in both disciplines, as well as appropriate courses in calculus and physics, is 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.

Biochemistry offers many opportunities in teaching, research, industry, and public service. Biochemistry also serves as a foundation for specialization in areas such as agriculture, food science, health, medicine and nutrition.

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 is designed to provide a liberal education with sufficient emphasis on science for students who wish to prepare for certain professional schools. The B.S. degree is designed to prepare students for professional careers in biochemistry or entry in graduate biochemistry training programs.

The requirements for the B.A. degree with a major in biochemistry include the general requirements of the College of Arts and Sciences (page 101 plus the following: Biochemistry Orientation (1 hour), Chemistry I & II (8 hours), Chemical Analysis (4 hours), Organic Chemistry I & II (6 hours), Organic Chemistry I & II Laboratory (4 hours), Biochemistry I & II (6 hours), General Biochemistry Laboratory (2 hours), Analytical Geometry and Calculus I & II (8 hours), General Physics I & II (8 hours), Principles of Biology (4 hours), Organismic Biology (4 hours), and biological science electives (4 hours). These science courses satisfy the mathematics and natural sciences requirements shown in the general requirements for the B.A. degree. The modern language requirement for the B.A. degree may be satisfied in any of the available languages.

The requirements for the B.S. degree with a major in biochemistry include the general requirements of the College of Arts and Sciences (page 101) plus the

following: Biochemistry Orientation (1 hour), Biochemistry Seminar (undergraduate, 0 hour), Chemistry I & II (8 hours), Chemical Analysis (4 hours), Organic Chemistry I & II (6 hours), Organic Chemistry I & II Laboratory (4 hours), Biochemistry I & II (6 hours), Biochemistry I & II Laboratory (4 hours), Physical Chemistry I & II (6 hours), Physical Chemistry II Laboratory (2 hours), upper division biochemistry or chemistry elective (3 hours, 1 hour of which must be Problems in Biochemistry), Analytical Geometry and Calculus I, II & III (12 hours), Engineering Physics I & II (10 hours) or General Physics I & II (8 hours), Principles of Biology (4 hours), Organismic Biology (4 hours), biological science electives (8 hours), and one year of either German, French or Russian. The science courses in this list satisfy the natural science requirements shown in the general requirements for the B.S. degree. The year of German, French or Russian satisfies two of the required seven humanities and social science courses shown in the general requirements.

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 analytical geometry and calculus, and 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 their 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 analytical 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 Biochemistry, page 39, for further details.

The Department of Biochemistry also participates in interdepartmental programs in animal science leading to the Master of Science and Doctor of Philosophy degrees with majors in animal nutrition, and in food science leading to the Master of Science and Doctor of Philosophy degrees with majors in food science. See Animal Science, page 38, and Food Science, page 40, for further details.

Courses in Biochemistry

Undergraduate Credit

211 100. Biochemistry Orientation. (1) I. Discussion of biochemistry as a discipline in the life sciences. 211-100-0-0414

211 110. Biochemistry and Society. (3) II. A cultural and environmental approach to biochemical compounds and circumstances affecting man. Topics to be discussed include compounds of biochemical interests, biochemical evolution, food additives, heavy metals, drugs, and certain control chemicals, e.g., pesticides. Intended for non-science majors. 211-110-0-0414

211 120. Introductory Organic and Biological Chemistry. (5) I, II, S. For students in home economics, nursing, and other areas desiring an integrated organic and biochemistry course to provide an understanding of carbohydrates, proteins, lipids and of digestive and metabolic systems. Three hours lec. and six hours lab. a week. Pr.: Chem. 110. 210-120-1-0414

211 201. Elementary Biochemistry. (3) I, II. An elementary treatment of the chemistry and metabolism of carbohydrates, lipids, proteins and nucleic acids. Pr.: Chem. 190. 211-201-0-0414

211 202. Elementary Biochemistry Laboratory. (2) I, II. A laboratory course to accompany Biochem. 201. Six hours lab. a week. Pr. or conc.: Biochem. 201. 211-202-1-0414

211 290. Biochemistry Seminar. (0-3) I, II. Lectures, discussions, and activities of biochemical interest. 211-290-0-0414

211 300. Sophomore Honors Seminar in Biochemistry (3) II 1979. 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. 211-300-0-4900.

Undergraduate And Graduate Credit In Minor Field

211 510. General Plant Biochemistry. (4) I. Occurrence, properties, functions and metabolism of the organic compounds of plants. Three hours lec. and three hours lab. a week. Pr.: Chem. 190 or 350. 211-510-1-0414

211 521. 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 Biochem. 201. Pr.: Chem. 350. 211-521-0-0414

211 522. 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.: Chemical analysis, Chem. 351 and Biochem. 521 or conc. enrollment, or Biochem. 665 or conc. enrollment. 211-522-1-0414

Undergraduate And Graduate Credit

211 655. 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. Biochem. 655 and 665 are for students interested in a two-semester comprehensive coverage of biochemistry. For a one-semester course, enroll in Biochem. 521. Pr.: *Chemical analysis, one year of organic chemistry, differential and integral calculus. 211-655-0-0414

211 656. Biochemistry I Laboratory. (2) I. An intensive laboratory course to accompany Biochem. 655. Biochem. 656 and 666 are sequential courses for students interested in a two-semester comprehensive coverage of experiments in biochemistry. For a one-semester laboratory course, enroll in Biochem. 522. Six hours lab. a week. Pr.: *Biochem. 655 or conc. enrollment. 211-656-1-0414

211 665. Biochemistry II. (3) II. Cont. of Biochem. 655; lipid chemistry and metabolism, amino acid metabolism, nutrition, nucleic acid chemistry and metabolism, integration of biochemical pathways and metabolic control mechanisms. Pr.: *Biochem. 655. 211-665-0-0414

211 666. Biochemistry II Laboratory. (2) II. A cont. of chem. 656. Six hours lab. a week. Pr.: *Biochem. 656 and 665 or conc. enrollment. 211-666-1-0414

211 670. Principles of Animal Nutrition. (3) II. The nutrients, nutrient requirements, functions and utilization of nutrients; nutrient balances; methods for animal nutrition studies and evaluation of feeds. Pr.: *Biochem. 655 and 656. 211-670-0-0414

211 700. Plant Biochemistry. (2) I. Offered 1978-79 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, cell wall biosynthesis, and production of materials of economic interest. Pr.: *Biochem. 510 or 521 or 665. 211-700-0-0414

211 701. Plant Biochemistry Laboratory. (1) Offered on sufficient demand. Practical experience in techniques necessary in dealing with plant materials for the isolation of active enzymes and analysis of constituents. Pr.: *Biochem. 700 or concurrent enrollment, and one of the following: Biochem. 510 or 522 or 656. 211-701-1-0414

211 790. 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, Biochem. 655, 656, 665 and 666. 211-790-1-0414

211 799. 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. 211-799-3-0414

*Non-majors lacking these prerequisites should obtain consent of instructor before enrollment.

Graduate Credit

211 806. Biochemistry Seminar. (0-1) I, II. Seminar for graduate students in biochemistry. 211-806-0-0414

211 810. Biochemistry of Toxic Materials. (2) I. Offered 1979-80 and alt. years. The chemistry of drugs, antimetabolites, metals and agricultural chemicals; their absorption, distribution, mode of action and effect on biochemical systems, metabolism and detoxication. Pr.: *Biochem. 665. 211-810-0-0414

211 820. Vitamins. (2) II. Offered 1979-80 and alt. years or on demand. A survey of the avitaminoses, chemical properties, biochemical roles, metabolic pathways and methods of assay of the vitamins. Pr.: *Biochem. 665. 211-820-0-0414

211 830. Animal Nutrition Techniques. (2) II. Laboratory investigations on vitamins, amino acids, minerals and energy. Practical experience in laboratory animal care, diet preparation, data collection and analysis. Pr.: *Biochem. 655 and 656. 211-830-0-0414

211 840. Intermediary Metabolism. (3) II; S on sufficient demand. Metabolic role of carbohydrates, lipids, proteins and amino acids, purines, pyrimidines, vitamins, minerals and hormones; biological oxidations: mechanisms of energy production and utilization. Pr.: *Biochem. 656 and 665. 211-840-0-0414

211 845. Hormones. (3) I. Offered 1978-79 and alt. years or on demand. The structure, biosynthesis, biochemical role, metabolism and interrelations of hormones in vertebrates and invertebrates. Pr.: Biochem. 665. 211-845-0-0414

211 850. Advanced Biochemistry Laboratory. (2) II. Specialized laboratory techniques for advanced biochemical investigations. Pr.: *Biochem. 666. 211-850-1-0414

211 899. Research in Biochemistry I. (Var.) I, II, S. Research in biochemistry, agricultural chemistry and nutrition, which may be used for preparation of the M.S. thesis. Pr.: *Sufficient training for research undertaken. 211-899-4-0414

211 910. Lipids. (2) II. Offered 1979-80 and alt. years. Chemistry of plant and animal lipids, their occurrence, metabolism and industrial uses. Pr.: *Biochem. 665. 211-910-0-0414

211 920. Nucleic Acids. (2) II. Chemistry, function, ymetabolism, and biological roles of nucleic acids, purines, pyrimidines, nucleosides, nucleotides and related compounds. Pr.: *Biochem. 665. 211-920-0-0414

211 930. Proteins. (2) I. Offered 1979-80 and alt. years. Lectures and readings on the chemical nature of proteins; fractionation; purification, structure, chemical and physical properties of proteins and amino acids. Pr.: *Biochem. 656 and 665. 211-930-0-0414

211 940. Chemistry of Carbohydrates. (2) I. Offered 1978-79 and alt. years. Lectures and readings on structural chemistry of carbohydrates, their general properties, biological and chemical reactions and the methods of characterization. Pr.: *Biochem. 656 and 665. 211-940-0-0414

211 950. Enzyme Chemistry. (3) II. Offered 1978-79 and alt. 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.: *Biochem. 665. 211-950-0-0414

211 951. Enzyme Laboratory. (2) II. Offered 1978-79 and alt. years. A laboratory course to accompany Biochem. 950. Pr.: *Biochem. 656 and 950 or conc. enrollment. 211-951-1-0414

211 960. Advanced Animal Nutrition. (3) I. Offered 1978-79 and alt. years or on sufficient demand. Lectures and readings on protein and amino acid requirements, metabolism, evaluation of protein quality, energy metabolism, nutrient interrelationships. Pr.: *Biochem. 655, 656, and a course in nutrition. 211-960-0-0414

211 999. Research in Biochemistry II. (Var.) I, II, S. Research in biochemistry, agricultural chemistry and nutrition, which may be used for preparation of the Ph.D. thesis. Pr.: *Sufficient training for research undertaken. 211-999-4-0414

*Non-majors lacking these prerequisites should obtain consent of instructor before enrollment.

DIVISION OF BIOLOGY

T.C. Johnson, Director
M.F. Hansen, Associate Director
Jerry S. Weis, Associate Director for Development of Instruction

Professors Barkley,* Bode,* Consigli,* Fina,* Hansen,* Hulbert,* T. Johnson,* Kramer,* Marzolf,* Pittenger,* Robel,* and Zimmerman;* Associate Professors Center,* Conrad,* Denell,* Iandolo,* M. Johnson,* Kammer,* Kelley,* Klaassen,* Marchin,* Rodkey,* Roufa,* C. Smith,* Spooner,* Tomb,* Urban,* Weis,* and Wilson;* Assistant Professors Brown,* Fretwell,* Murphy,* Williams,* and Wong;*Instructors Eads, Granrose, Hook, Paulsen, and A. Smith. Emeritus: Professors Ameel,* Gier,* Goodrich,* Pady,* and Wimmer;* Associate Professors Lockhart,* McCracken,* and Newcomb.*

The Division of Biology has the largest science faculty in the College of Arts and Sciences, thereby reflecting the breadth of biology as a dominant academic discipline in our times. Developments in the past quarter century have linked many biological phenomena to firmly-based concepts of physics and chemistry, and have opened a wide array of theory and techniques to approach biological phenomena which are only beginning to be understood; e.g. the mechanisms of organism development, the function

of the nervous system and its manifestation in behavior, and the biological bases of malfunctions leading to disease. Likewise, developments in mathematics, statistics, data processing and geology are providing new approaches to the complex problems of ecological function and evolution. All of these biological problems are both intellectually challenging and relevant to many societal problems. Through research the faculty of the Division of Biology seeks to contribute to the solution of these problems. Through teaching it seeks to develop the competence in students to contribute creatively in the next generation of biological scientists and in the generally educated citizenry.

The several curricula which follow are supplemented by extracurricular experiences ranging from participation in Bioclub, Microbiology Club, the Student Chapter of the Wildlife Society or Alpha Epsilon Delta (national premedical professions honorary) to participation in independent reseach and assisting faculty members in teaching or research programs.

Undergraduate Study

The biology undergraduate requirements provide students a basic understanding of biological principles and methods and allow opportunity for 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 specifically 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 advisers 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 advisers.

Biology Degree.

Students may arrange their programs to receive either a B.A. or a B.S. degree; the essential distinction between the two is that the B.A. requires course work in a foreign language while the B.S. degree does not.

In addition to the general requirements of the College of Arts and Sciences, courses required for a bachelor's degree in biology are: Organismic Biology (5 hrs.) [note: credit for Principles of Biology (215 198), a prerequisite to Organismic Biology, is not necessarily required. Incoming biology majors who have had substantial high school biology are encouraged to enter Organismic Biology directly. Permission to do this requires the student take either the CLEP exam or an examination prepared by the Division of Biology and achieve a score which qualifies to bypass Principles of Biology. If the student elects to take Principles of Biology for credit the elective requirement (see below) will be reduced from 17 to 15 hours of biology]; Population Biology (4 hrs.); Molecular Biology (3 hrs.); Cellular and Developmental Biology (5 hrs.) plus 17 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: General Physics I and II (8 hrs.) or Engineering Physics I and II (10 hrs.); Analytic Geometry and Calculus (4 hrs.) [note: Math 100, 150, or two years of high school algebra and one semester of trigonometry are prerequisite to Analytic Geometry and Calculus I]; Chemistry I (4 hrs.), Chemistry II (4 hrs.); General Organic Chemistry (5 hrs.) or Organic Chemistry I (5 hrs.); and General Biochemistry (3 hrs.) or Biochemistry I and II (6 hrs.).

Students contemplating graduate school are encouraged to take additional work in mathematics, statistics and a modern foreign language.

Microbiology Degree:

The degree may be either a B.A. or a B.S. depending upon which electives are chosen by the student and adviser. The major in microbiology consists of the general requirements of the College of Arts and Sciences, plus the following courses in the Division of Biology: Principles of Biology (4 hrs.), Microbiology (5 hrs.), Bacteriology of Human Diseases (5 hrs.), Immunology (4 hrs.), Genetics of Microorganisms (3 hrs.), Microbial Physiology Lec. (3 hrs.), Microbial Physiology Lab. (2 hours), General Virology (3 hrs.), plus 8 additional hours of microbiology of the student's choice. Only one hour of practicum credit can be counted as elective biology hours toward the microbiology degree. The following courses given by other departments also are required: Analytic Geometry and Calculus I (4 hrs.), Chemistry I (4 hrs.), Chemistry II (4 hrs.), Chemical Analysis (4 hrs.), Organic Chemistry I (5 hrs.), Organic Chemistry II Lecture (3 hrs.), General Biochemistry Lecture (3 hrs.) or Biochemistry I and II Lecture (6 hrs.), and General Physics I & II (8 hrs.). Students contemplating graduate school should also consider taking a modern foreign language.

Fisheries and Wildlife Biology Degrees.

This curriculum has three options: fisheries biology, wildlife biology and conservation. In addition to the general requirements of the College of Arts and Sciences, these courses are required in each of the options.

From the Division of Biology: Organismic Biology (5 hrs.) [note: credit for Principles of Biology (215 198), a prerequisite to Organismic Biology, is not necessarily required. Incoming majors who have had substantial high school biology are encouraged to enter Organismic Biology directly. Permission to do this requires the student take either the CLEP exam or an examination prepared by the Division of Biology and achieve a score which qualifies to bypass Principles of Biology.]; Population Biology (4 hrs.); Wildlife Conservation (3 hrs.); and Ecology (4 hrs.).

These courses from other departments also are required for each option: Biometrics I (3 hrs.); Analytic

Geometry and Calculus (4 hrs.) [note: Math 100, 150, or two years of high school algebra and one semester of trigonometry are prerequisite to Analytic Geometry and Calculus I]; Chemistry I (4 hrs.); Chemistry II (4 hrs.); General Organic Chemistry (5 hrs.) or Organic Chemistry I and II (8-10 hrs.); a second course in speech(3 hrs.); Soils (4 hrs.) or Geology I (3 hrs.); and Fundamentals of Nutrition (3 hrs.) or General Biochemistry (3 hrs.).

Additional requirements for the fisheries biology option include: Biometrics II (3 hrs.); General Physics I & II (8 hrs.); Lower Plants (3 hrs.); Ichthyology (3 hrs.); Fisheries Biology (2 hrs.); Fisheries Management (3 hrs.); Aquaculture (3 hrs.); Freshwater Invertebrate Biology (2 hrs.); Limnology (2 hrs.); Limnology Methods (1 hr.); Physiological Adaptations of Animals (4 hrs.); and Cellular and Developmental Biology (5 hrs.) or Microbiology (5 hrs.).

Additional requirements for the wildlife biology option include: Biometrics II (3 hrs.); General Physics I & II (8 hrs.); Higher Plants (4 hrs.); Ornithology (3 hrs.); Mammalogy (3 hrs.); Wildlife Management (2 hrs.); Wildlife Management Techniques (3 hrs.); Entomology (3 hrs.); Physiological Adaptations of Animals (4 hrs.); and Cellular and Developmental Biology (5 hrs.) or Microbiology (5 hrs.).

Additional requirements for the Conservation option include: Natural Resources Economics (3 hrs.), Descriptive Physics (4 hrs.); Higher Plants (4 hrs.); Fisheries Biology (2 hrs.); Wildlife Management (2 hrs.); Forest Conservation (2 hrs.); Range Management I (3 hrs.); Plant Physiology (4 hrs.) or Physiological Adaptations of Animals (3 hrs.); two of: Ichthyology (3 hrs.), Ornithology (3 hrs.), or Mammalogy (3 hrs.); and two of: Cellular and Developmental Biology (5 hrs.), Microbiology (5 hrs.), or Evolutionary Biology (2 hrs.).

Professional and Pre-Professional Curricula.

Students preparing to seek admission to medical school, dental school, veterinary school or similar professional school may major in biology (or other academic discipline) provided the specific pre- professional requirements are met. Such students are encouraged to contact the appropriate pre- professional adviser through either the Division of Biology office or the dean's office as early in their academic careers as possible. This will facilitate the planning of a proper academic program for the students' professional goals.

The Division of Biology is intimately associated with several professional degree programs which are officially organized by the office of the Dean of Arts and Sciences. These programs are physical therapy, medical technology and pre-nursing. Students with professional interests in these fields should contact either the Division of Biology office or the dean's office.

Special advisement is offered in connection with the College of Education for students preparing to be biology teachers in the secondary schools.

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, genetics, and parasitology. Graduate programs in the division generally relate to one of the four 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, and systematics and ecology.

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 the Division of Biology

Undergraduate Credit

215 198. 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, equivalent to two hours of lec., one hour of rec., and three hours of lab. per week. 215-198-1-0401

215 201. 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 six hours rec. and lab. Pr.: Biol. 198 or equiv. 215-201-1-0401

215 210. General Botany. (4) I, II. Plant groups and their evolutionary development. Physiology, anatomy, ecology, and identification of seed plants. Economic applications. Two hours lec. and six hours lab. per week. 215-210-1-0402

215 220. Bacteriology and Man. (3) I, II. Fundamental concepts of microbial activities, the techniques for studying them, modes of action, role in natural and man-made ecosystem, with special emphasis on relationships to man. Not for biology or microbiology majors. Two hours lec. and three hours lab. per week. Pr.: One course in Biology, one course in Chemistry. 215-220-0-0403

215 222. Field Ornithology. (1) II odd years. Identification of bird species in the field and the illustration of attributes of avian behavior and ecology. One three-hour lab. per week. Pr.: Sophomore standing. 215-222-1-0499

215 240. Structure and Function of the Human Body. (6) I, II. Anatomy and physiology of the organ systems of the body. Course is directed toward non-biology majors. Four hours lec. and two three-hour lab. sessions per week. Pr.: Biol. 198. 215-240-1-0410

215 303. Ecosystems and Society. (3) II. Principles of ecology and their application to such problems as pollution, human population growth, and land use planning, and to show the interdependence of all fields of human endeavor in affecting environment. Two hours lec. and one hour discussion per week. Pr.: Two courses in natural science. 215-303-0-0420

215 310. 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. Two hours lec. and one hour discussion per week. Pr.: Junior standing. 215-310-0-0401

215 315. Field Studies. (1-2) Offered in Intersession only. Intensive investigation of biological subjects at various geographical locations. Pr.: Biol. 201. 215-315-2-0401

215 360. Freshwater Invertebrate Biology. (2) II. A basic course in techniques of collection, preservation and identification of freshwater invertebrates of the Great Plains region. Two three-hour labs per week. Pr.: Biol. 198. 215-360-1-0407

215 365. Practicum in Biology. (2-4) I, II. Experimental approaches to learning biology through teaching. One hour rec. per week plus 3-9 hours lab. per week. Pr.: Permission of instructor and credit with superior performance in the course in which the student will be involved. 215-365-2-0401.

215 397. Topics in Biology. (1-6) I, II, S. Pr.: Consent of instructor. 215-397-2-0401.

215 399. Honors Seminar in Biology. (1-3) II 1978, Selected topics. Open to non-majors in the Honors Program. 215-399-0-4900

215 400. Human Genetics. (3) II. A course dealing exclusively with human heredity and with those genetic principles that can be illustrated in humans. Pr.: Biol. 198. 215-400-0-0422.

215 430. 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. 215-430-0-0420

215 440. Cellular and Developmental Biology. (5) II. A course that considers cellular and developmental biology of eukaryotic cells. Treatment of the subcellular and molecular aspects of requisite and specialized cellular properties from the viewpoint of structure and function. Pr.: Biol. 201 and Chem. 350 or equiv. 215-440-0-0417

215 450. Molecular Biology. (3) I. An introduction of the synthesis and regulation of DNA, RNA, and protein. Mutation and the chromosome are studied at the molecular level and emphasis is placed on the handling of biological information in both higher and lower organisms. Pr.: Biol. 403 and Chem. 350 or equiv. 215-450-0-0416

215 460. Animal Virology Laboratory. (2) II. Laboratory techniques and investigative procedures for the analysis of viral growth in animal cell cultures. This course is intended for undergraduate students only, but is offered in conjunction with General Virology (Biol. 730). Pr.: Concurrent enrollment in Biol. 730. 215-460-1-0416

215 497. Senior Honor Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 215-497-3-4900

Undergraduate And Graduate Credit In Minor Field

215 500. 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. 215-500-1-5-0406

215 505. Comparative Anatomy of Vertebrates. (4) II. Two hours rec. and six hours lab. per week. Pr.: Biol. 198. 215-505-1-0412

215 510. Embryology. (4) II. Developmental anatomy and physiology of reproduction of birds and mammals. Three hours lec. and three hours lab. per week. Pr.: Biol. 198. 215-510-1-0427

215 513. 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. 215-513-0-0410

215 514. Physiological Adaptations of Animals Laboratory. (1) I. One three-hour lab. per week. Pr.: Concurrent enrollment in Biol. 513. 215-514-1-0-0410

215 518[1]. Histology. (4) II. Microscopic anatomy of the organs and tissues of the mammal as a basis for understanding diversity of function and malfunction. Two lectures and two two-hour labs per week. Pr.: Biol. 198. 215-518-1-0413

215 520. Microbiology of Foods. (4) I. Microbial phenomena involved in the bacteriology and sanitation of foods. Two hours rec. and four hours lab. per week. Pr.: Biol. 555 or equiv. 215-520-1-0411

215 525. Systemic Physiology. (4) II. Functions of various organ systems of vertebrates, primarily mammals. Three hours lec. and two hours lab. per week. Pr.: Biol. 198 and a course in biochemistry or organic chemistry. 215-525-1-5-0410

215 529. Fundamentals of Ecology. (3) I. Ecosystem structure and function including energy flow; biogeochemical cycling; effect of climate, soil, fire, succession; application of ecological principles to forests, range, agriculture and man. Two lectures and one discussion per week, plus three half-day field trips. Not for major credit. Pr.: Biol. 201 or 210 and Chem. 210. 215-529-0-0420

215 533. Wildlife Conservation. (3) II. Methods and techniques in the management and propagation of wildlife. Pr.: Two courses in Biology. 215-533-0-0107

[1]Not offered in '78-'79.

215 535. Cell Biology. (3) I. Chemistry, structure and function of cells and cellular components. Three hours lec. per week. Pr.: Biol. 440. 215-535-0-0417

215 536. Cell Biology Laboratory. (2) I. Two three-hour labs. per week. Pr.: Concurrent enrollment in Biol. 535. 215-536-1-0-0417

215 542. Ichthyology. (3) II. Classification, morphology, physiology, distribution and natural history of fishes. Two hours lec. and three hours lab. a week. Pr.: Biol. 198. 215-542-1-0407

215 543. Ornithology. (3) II. Classification, morphology, physiology, distribution and natural history of birds. Two hours lec. and three hours lab. a week. Pr.: Biol. 198. 215-543-1-0407

215 544. 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. 198. 215-544-1-0407

215 545. 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 hous lec. a week. Pr.: Biol. 201. 215-545-0-0411

215 546. Human Parasitology Laboratory. (1) II. Examination of prepared materials and identification of internal parasites of man. Two hours lab. a week. Pr.: Concurrent enrollment in Biol. 545. 215-546-1-0411

215 547. Herpetology. (2) II in odd years. Classification morphology, physiology, distribution and natural history of amphibians and reptiles. One hour lec. and three hours lab. per week. Pr.: Biol. 198. 215-547-1-3-0407

215 550. Lower Plants. (3) II. Morphology, adaptive mechanisms, and evolutionary relationships of the cellular and vascular cryptograms. Two hours lec. and one three-hour lab. a week. Pr.: Biol. 201 or 210. 215-550-1-0402

215 551. Higher 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. 215-551-1-0402

215 555. Microbiology. (5) I, II. Microorganisms; their morphology, physiology, classification and importance. Three hours lec. and four hours lab. a week. Pr.: One course in biology and a course in organic chemistry. 215-555-1-0411

215 560. Evolutionary Biology. (2) II. Historical development and social impact of the theory of evolution, the process of speciation and phylogeny of major taxa. Three hours lec. and one hour rec.; first half of semester. Pr.: Biol. 201. 215-560-0-0422

215 565. Developmental Biology. (3) II. An experimental analysis of developmental phenomena in plants and animals. Emphasis on elucidation of molecular mechanisms. Three hours lec. per week. Pr.: Biol. 440. 215-565-0-0427

215 566. Developmental Biology Laboratory. (1) II. Experimental research in developmental biology of plants and animals. An investigative project approach will be followed rather than scheduled routine laboratory exercises. Pr.: Biol. 565 or concurrent enrollment. Enrollment by permisssion of instructor only. 215-566-1-0-0427

Undergraduate And Graduate Credit

215 610. Bacteriology of Human Diseases. (5) I. Three hours lec. and six hours lab. a week. Pr.: Biol. 555 or equiv. 215-610-1-0411

215-615. Cytogenetics. (4) I in even years. Chromosome structure and mechanics, cytotaxonomy and karyotypic analysis in eukaryotes. Two hours lecture and 6 hours lab per week. Field trips. Pr.: Biol. 430 or a course in genetics. 215-615-1-3-0422

215 625. Animal Parasitology. (3) I. Biology, pathology and prophylaxis of the principal external and internal parasites of domestic animals. Two hours lec. and three hours lab. a week. Pr.: Biol. 198 and junior standing. 215-625-1-0411

215 631. Ecology. (3) II. Descriptive and mathematical understanding of ecosystem structure and dynamics, including succession, energy flow, and nutrient cycling. Pr.: Biol. 430. 215-631-0-0420

215 632. Ecology Laboratory. (1) II. Laboratory and field experiences with ecological problems. Pr.: Stat. 340 or equiv., Biol. 631 or concurrent enrollment. 215-632-1-0-0420

215 634. Soil Microbiology. (3) I. Microbial population of the soil and its role in soil fertility. Pr.: Biol. 555 or equiv.; Chem. 351 or equiv. 215-634-1-0411

215 640. 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. 215-640-1-0411

215 645. 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. 215-645-2-0401

215 651. Molecular and General Genetics. (3) II. A course intended for those who have had an introduction to both Mendelian genetics and the elements of molecular biology. Classical genetics will be reviewed and expanded, and modern concepts of mutation, gene structure, function and regulation will be considered at the genetic and molecular levels. Pr.: Biol. 450 or an introductory genetics course. 215-651-0-0422

215 661. Evolution and Systematics. (2) II. A survey of systematic approaches to evolutionary problems. Three hours lec. and one hour rec.; second half of semesster. Pr.: Biol. 430 and 560 or graduate standing. 215-661-0-0422

215 662. Evolution and Population Genetics. (2) II. Evolution at the population level; mating systems, genetic load, maintenance of variation, sex. Three hours lec. and one hour rec.; second half of semester. Pr.: Biol. 430 and 560 or graduate standing. 215-662-0-0422

215 667. Neurobiology. (4) I. Neuronal mechanisms of coordination in animals, with emphasis on neuronal mechanisms underlying behavior in simple systems. Two hours lec. and two three-hour labs a week. Pr.: Biol. 440. 215-667-1-0425

215 670. 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 equivalent. 215-670-0-0411

215 671. Immunology Lab. (1) II. Laboratory exercises in conjunction with Biol. 670 Immunology. Pr. or conc.: Biol. 670. 215-671-1-0411

215 675. 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. 555. 215-675-0-0422

215 680. Aquaculture. (3) II. Principles of producing fish for use as human food. Topics of study include: species of fish used in production, breeding and selection; feeds and feeding of fishes; the role of essential vitamins and amino acids in maintaining growth and vitality of various sizes of fish; and the environmental implications of commercial fish production. Pr.: Biol. 695 and Animal Science 200 or Biochem. 521. 215-680-1-0107

215 684. Wildlife Management. (2) II. Designed for Fisheries and Wildlife Biology students. Fundamentals of managing wildlife with emphasis on North American game species; historical and recent developments in the field of wildlife management; habitat improvement, and related material. Two hours lec. a week. Pr.: Biol. 533. 215-684-0-0107

215 685. Wildlife Management Techniques. (3) I. Ecology and management techniques. Two hours lec. and three hours lab. a week. Pr.: Biol. 533 and 632. 215-685-1-0107

215 690. Microbial Physiology. (3) II. The study of bacteria as an integrated biochemical system emphasizing how the biochemical aspects serve the functional properties of cells. Pr.: Biol. 555 and Biochem. 521 or 655. 215-690-0-0411

215 691. Microbial Physiology Laboratory. (2) II. Examination of microbial processes by biological and biochemical methods. Six hours a week. Pr.: Concurrent enrollment in Biol. 690. Enrollment of students in curricula other than microbiology is by permission of instructor. 215-691-1-0411

215 693. Limnology. (2) I. Studies of inland lakes and streams. Emphasis is placed on water as a physical and chemical environment as it affects the nature of biological interactions and productivity. Two hours lec. Pr.: Two laboratory courses in natural sciences plus Biol. 201 and Chem. 230. 215-693-0-0420

215 694. Limnological Methods. (1) I. Problems in field observation and measurement of limnological phenomena. One three-hour lab. a week. Pr.: Stat. 340, Biol. 631, and concurrent enrollment in Biol. 693. 215-694-1-0420

215 695. Fisheries Biology. (2) I. Principles and concepts that form the basis for management of fisheries resources. Topics include: physicochemical conditions in water; fish metabolism; fish population dynamics; and the interactions between fishes and varying environmental conditions. Two hours lec. Pr.: Biol. 542 and Chem. 230. 215-695-0-0107

215 696. Fisheries Management. (3) I. Methods of managing fisheries resources; physical and biological survey methods; methods of aquatic environment improvement; fish population manipulation; management of streams, ponds and lakes. Two hours lec. and three hours lab. a week. Pr.: Biol. 695 or concurrent enrollment. 215-696-1-0107

215 697. Topics in Biology. (1-6) I, II, S. Pr.: Consent of instructor. 215-697-3-0401

215 698. Problems in Biology. (1-8) I, II, S. Pr.: Consent of instructor. 215-698-3-0401

215 699. Undergraduate Seminar in Biology. (1) I, II. Pr.: Consent of instructor. 215-699-2-0401

215 700. Advanced Plant Physiology I. (3) II in even years. Modern concepts and areas of research in plant physiology. Respiration, photosynthesis and water relations of plants. Pr.: An introductory plant physiology course or general biochemistry. 215-700-0-0406

215 701. Advanced Plant Physiology II. (3) II in odd years. Modern concepts and areas of research in plant physiology. Mineral nutrition, translocation, growth and development of plants. Pr.: An introductory plant physiology course or general biochemistry. Previous enrollment in Bio 700 is not required. 215-701-0-0406

215 705. 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. 640. 215-705-1-0411

215 710. 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. 215-710-0-0410

215 715. Ecological Impact Assessment. (3) I. Solving problems involving the effect of human activity on the biological environment. Students will identify factors of biological concern and make impact predictions. Pr.: two 400-level courses in two of the following fields: biological, physical, agricultural, geological or geographical sciences or equivalent. 215-715-0-0420

215 725. Use of Models in Biology. (3) I. Rationale behind the use of models, formal logic and statistical methods of data analysis in biological research. Review of commonly used biological models, exercises in formal hypothesis development and model building. Three hours lec. a week. Pr.: Math. 220 or 500 and Stat. 320 (or concurrently). 215-725-0-0419

215 730. 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. 555 or equiv. and Biochem. 521 or equiv.; consent of instructor. 215-730-1-0411

215 740. Anatomy of Higher Plants. (3) II in odd years. Structure and development of the various tissues and organs of seed plants. One hour lec. and six hours lab. a week. Pr.: Biol. 201 or 210. 215-740-1-0402

215 750. Molecular and Cellular Biology. (3) I. 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.: Biochem. 522 or equiv and consent of instructor. 215-750-0-0417

215 770. Microorganisms of the Natural Environment. (3) I in even years. A study of representatives of the major groups of bacteria isolated by enrichment methods from natural environments. Six hours lab. per week. Pr.: Biol. 690 and Biochem. 521. 215-770-1-0420

Graduate Credit

215 830. 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. 215-830-1-0411

215 840. Molecular Immunology. (3) I in odd years. Lectures and readings covering the chemical and physical properties of antibodies. Pr.: Biol. 670 or equiv. and consent of instructor. 215-840-0-0411

215 845. Animal Behavior. (3) II in odd years. The study of the mechanisms, ontogeny, and evolution of social and non-social behavior from an adaptive viewpoint. Discussion, lecture, laboratory and field exercises. Pr.: At least one year of biology. 215-845-1-0420

215 858. Regulation of Gene Expression. (3) II. An analysis of the mechanisms controlling the expression of genetic information in biological systems of varying complexity. Emphasizes the biochemical, genetic and physical basis of regulation and development. Pr.: Biochem. 522 or equiv.; a basic knowledge of molecular biology and consent of instructor. 215-858-0-0422

215 865. 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. per week. Pr.: Biol. 500 and Biol. 529 or 631. 215-865-1-0420

215 868. Advanced Cellular and Developmental Biology. (3) I. Chemistry, structure and function of cellular systems in growth, development and reproduction. Pr.: Biochem. 522 or equiv. 215-868-0-0417

215 870. Advanced Systematic Botany. (4) I in odd years. Classification, nomenclature and taxonomic theory of vascular plants. Two hours rec. and six hours lab. per week. Pr.: Biol. 551. 215-870-1-0402

215 880. Population Ecology. (3) II. Growth and regulation of populations, cycles, competition theory, seasonal effects, predator-prey and community relationships, biogeography and social regulation. Intensive consideration of current theoretical developments, and recent field population studies. Pr.: Biol. 631, a course in Calculus and a course in Statistics. 215-880-0-0420

215 881. Ecosystems Energetics. (3) I in even years. Three credit hours of lecture and discussion. A study of the constraints placed on energy flow in ecosystems by bioenergetic principles at cellular, individual and population levels of organization.The course will involve extensive reading of original literature. Pr.: Consent of instructor. 215-881-0-0420

215 882. Reservoir Limnology. (3) II in even years. Current investigations in aquatic ecology and limnology as they pertain to reservoirs. Great Plains reservoirs will be viewed as systems for investigation of ecological phenomena. Pr.: Biol. 693. 215-882-0-0420

215 890. Advanced Topics in Biology. (1-6) I, II, S. Pr.: Consent of instructor. 215-890-3-0401

215 891. Advanced Problems in Biology. (1-8) I, II, S. Pr.: Consent of instructor. 215-891-3-0401

215 895. Graduate Seminar in Biology. (1) I, II. Pr.: Consent of instructor. 215-895-0-0401

215 898.Master's Research in Biology. (1-9) I, II, S. 215-898-4-0401

215 899. Master's Research in Microbiology. (1-9) I, II, S. 215-899-4-0411

215 998. Research in Biology. (Var.) I, II, S. 215-998-4-0402

215 999. Research in Microbiology. (Var.) I, II, S. 215-999-4-0411

CHEMISTRY

William G. Fateley, Head of Department*

Professors Copeland,* Fateley,* Hammaker,* Hawley,* Kruh, Lambert,* McDonald,* Meloan,* Moser,* and Setser;* Associate Professors Danen,* DesMarteau,* G.D. Johnson,* Kay,* Paukstelis,* Purcell,* and van Swaay;* Assistant Professors Fry,* T. Johnson,* Lenhert and Petersen.* Emeritus: Professors Andrews, Lash, Schrenk, and Silker; Associate Professor Lanning, Assistant Professor Harriss; Instructor Crawford.

The Department of Chemistry occupies Willard Hall and the H.H. King Chemical Laboratory. The faculty of the department consists of 21 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

Chemistry graduates from KSU are sought by chemical industries and graduate schools and by high schools as chemistry teachers. Also, 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 good preparation in mathematics, chemistry, physics and English composition. Trigonometry and two years of algebra should be taken; more math is good.

Transfer Students

Community college students should take general chemistry, qualitative and quantitative analysis, one year of organic chemistry, analytic geometry, calculus, physics, and English composition.

Independent Study and Research

Many chemistry students at Kansas State University are engaged in independent study and research. Some begin their freshman year, and some begin later, working on their own research projects in a research laboratory under the supervision of a faculty member of their choice. A significant number publish the results of their work in scientific journals.

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 are especially well suited for work in industry or 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 advisers in both chemistry and education.

Graduate Study

Programs leading to the M.S. and Ph.D. degrees are offered. Research and graduate level courses are conducted in the areas of analytical, inorganic, organic, and physical chemistry and adequately prepare students for a career in research or college and university teaching.

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 (see below). Prospective graduate students whose undergraduate training does not meet these requirements may be admitted on a provisional basis but are 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 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, Kansas State University, Manhattan, Kansas 66506.

Chemistry Curriculum for the B.S. Degree[1]

Preferred curriculum for those preparing for employment as chemists or those preparing for graduate study in chemistry.

120 credit hours required for graduation.

Chemistry: 41 hours (course hours are in parentheses)
Freshman: Chem. I (4); Chem. II (4); Chem. Analysis (4).
Sophomore: Org. I (3); Org. I Lab. (2); Org. II (3); Org. II Lab. (2); Chem. Separations (2).
Junior: Phys. Chem. I (3); Phys. Chem. II (3); Phys. Chem. II Lab. (2).
Senior: Struct. and Bonding (2); Instrumental Anal. (4); Undergrad. Research (3) (May be taken prior to the senior year.)

Mathematics: 12 hours
Freshman: Anal. Geom. & Calc. I (4); Anal. Geom. & Calc. II (4).
Sophomore: Anal. Geom. & Calc. III (4).

Physics: 10 hours
Sophomore: Engg. Phys. I (5); Engg. Phys. II (5).

English: 6 hours
Freshman: Engl. Comp. I (3); Engl. Comp. II (3).

Speech: Oral Communication (or another course recommended by the speech department).

Physical Education: Concepts in Phys. Ed. (1).

Social Sciences and Humanities: 7 courses from the departments of art, economics, English, history, modern languages, music, philosophy, political science,

psychology, sociology, anthropology and social work, or speech. Courses must include:

a. German: German I and II or German for Reading Knowledge I and II

b. Philosophy: 1 course

c. 2 advanced courses (500 level or above or German III and IV)

Electives: sufficient courses to complete a total of 120 hours.

Chemical Science Curriculum for the B.S. Degree[1]

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, agriculture.

120 credit hours required for graduation.

Chemistry: (course hours are in parentheses)
Chem. I (4); Chem. II (4); Chem. Analysis (4).
Org. I (3); Org. I Lab. (2); Org. II (3); Org. II Lab. (2); Chem. Separations (2). Desc. Phys. Chem. (3)

One additional course in chemistry or biochemistry.

Mathematics:
College Algebra (3); Plane Trigonometry (3); Anal. Geom. & Calc. I (4); Anal. Geom. & Calc. II (4). (Requirements for College Algebra and Plane Trigonometry waived for those with credit in Anal. Geom. & Calc. I.)

Physics:
Gen. Phys. I (4); Gen. Phys. II (4).

English:
Engl. Comp. I (3); Engl. Comp. II (3).

Speech: Oral Communication I (or another course recommended by the speech department)

Physical Education: Concepts in Phys. Ed. (1).

Social Sciences and Humanities: 7 courses from the Departments of art, economics, english, geography, history, journalism and mass communications, modern languages, music, philosophy, political science, psychology, sociology, anthropology and social work, or speech. Courses must include:

a. Philosophy: 1 course

b. 2 advanced courses (500 level or above)

Electives: sufficient courses to complete a total of 120 hours.

Courses in Introductory and General Chemistry

Undergraduate Credit

221 095. Chemistry Seminar. (0) I, II. 221-095-0-1905

221 100. 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. 221-100-0-1905

221 110. General Chemistry. (5) I, II. Principles, laws and theories of chemistry; important metallic and non-metallic substances. Three hours lec., one hour rec. and three hours lab. a week. Not open to students having credit in any college course in chemistry. 221-110-1-1905

221 210. Chemistry I[2]. (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 Chem. 100) and Math. 010 (or equiv.). 221-210-1-7-1905

221 230. 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.: Chem. 210. 221-230-1-7-1905

221 399. Sophomore Honors Seminar (3) I ,II. Open to students in the Arts and Sciences Honors Program. 221-399-0-4900

221 498. Senior Honors Thesis (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 221-498-4-0401.

221 499. Problems in Undergraduate Chemistry. (Var.) I, II, S. Problems may include classroom and/or lab. work. Pr.: Consent of instructor. 221-499-3-1905

Undergraduate And Graduate Credit In Minor Field

221 599. Undergraduate Research. (1, 2, 3) I, II, S. Analytical, inorganic, organic or physical chemistry. 221-599-4-1905

Undergradaute And Graduate Credit

221 700. 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. 221-700-2-1905

221 799. Problems in Chemistry. (Var.) I, II, S. Problems may include classroom or laboratory work. Not for thesis research. Pr.: Consent of instructor. 221-799-3-1905

Graduate Credit

221 899. Research in Chemistry. (Var.) I, II, S. Research in analytical chemistry, inorganic chemistry, organic chemistry, and physical chemistry for the M.S. degree. 221-899-4-1905

221 999. Research in Chemistry. (Var.) I, II, S. Research in analytical chemistry, inorganic chemistry, organic chemistry and physical chemistry for the Ph.D. degree. 221-999-4-1905

Courses in Analytical Chemistry

Undergraduate Credit

221 240. Environmental Chemistry Laboratory. (1) I, II. Selected experiments in air quality, water quality and other environmental topics. Three hours lab. a week. Pr.: Chem. 230 or concurrent enrollment. 221-240-1-0-1909

221 271. Chemical Analysis. (4) I, II, S. Principles of chemical equilibria and qualitative, gravimetric and titrimetric analyses. Two hours lec. and six hours lab. a week. Pr. or conc.: Chem. 230. 221-271-1-1909

Undergraduate And Graduate Credit In Minor Field

221 540. Research Techniques. (3) II. Principles and applications of techniques in research; to include chromatography, spectroscopy, electrochemistry, dialysis, electrophoresis and distillation. Two hous lec. and three hours lab. a week. Pr.: Chem. 250 and 350. 221-540-1-1909

221 545. Chemical Separations. (2) II. Principles of modern separation techniques. One hour lec. and three hours lab. a week. Pr.: Chem. 271 or equiv. 221-545-1-1909

Undergraduate And Graduate Credit

221 666. Instrumental Analysis. (3) I, II, S. Three hours lecture a week. 221-666-0-1909

221 667. Instrumental Analysis Laboratory. (1) I, II, S. Three hours lab. a week. 221-667-1-0-1909

221 668. Chemical Equilibria. (1) II. One hour lecture a week. 221-668-0-1909

221 725. Instrumentation in Chemistry. (3) I, II. 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.: Chem. 666 or consent of instructor. 221-725-1-1909

221 728. Chemistry of Analytical Reactions. (2) II. A study of the inorganic and organic reagents of importance in analytical chemistry and their reactions in sensitive and selective methods of analysis. Pr.: Chem. 550, 597, 666 or equivalent courses. 221-728-1-1909

Graduate Credit

221 901. Graduate Seminar in Analytical Chemistry. (0-1) I, II. 221-901-0-1909

221 921. Advanced Separations. (2) II in even years. Two hours lecture a week. 221-921-0-1909

221 922. Advanced Separations Laboratory. (1) II in even years. Three hours of lab. a week. 221-922-1-0-1909

221 942. Advanced Analytical Chemistry. (3) I in odd years. Elemental and functional group analyses, nonaqueous solvent systems, gas analysis, kinetics and thermal methods of analysis. Pr.: Chem.[3] 221-942-0-1909

221 944. Electroanalytical Chemistry. (2-3) I in even years. Theory and applications of electrochemical methods; chronoamperometry, chronopotentiometry, cyclic voltammetry, coulometry, polarography, potentiometry and instrumentation. Pr.: Chem.[3] 221-944-1-1909

221 945. Selected Topics in Analytical Chemistry. (1-3) Offered on sufficient demand. A lecture course in analytical chemistry in areas of specialization of the faculty, with emphas 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.: Chem.3 221-945-0-1909

221 946. Principles and Techniques of Analytical Chemistry I. (1-5) II of odd years. A lecture and laboratory course on emission spectroscopy, flame photometry, atomic absorption, and x-ray methods. Pr.: Chem.[3] 221-946-1-1909

221 947. Principles and Techniques of Analytical Chemistry II. (1-4) II of even years. A lecture and laboratory course on ultraviolet and visible absorption, infrared and Raman methods, fluorescence, phosphorescence, polarimetry and refractometry. Pr.: Chem.[3] 221-947-1-1909

221 948. Computer Control of Chemical Instruments. (3) The technique and use of a mini-computer in the laboratory environment, 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.: Chem. 725. 221-948-1-1909

Courses in Inorganic Chemistry

Undergraduate And Graduate Credit In Minor Field

221 597. Structure and Bonding. (2) I, S. 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.: Chem. 550, 595. 221-597-0-1906

Undergraduate And Graduate Credit

221 710. Chemical Applications of Group Theory. (1) I. Applications of group theory to molecular structure, bonding and spectra. One hour lec. a week. Pr.: Chem.[3] 221-710-0-1906

221 760. Main Group Reactivity. (2) II, S. Theory and properties of main group elements with emphasis on group characteristics. Two hours lec. a week. Pr.: Chem. 597. 221-760-0-1906

221 765. Transition Metal Group Reactivity. (2) II, S. The structure, spectroscopy and reactivity of the transition metals and their compunds. Pr.: Chem. 597. 221-765-0-1906

Graduate Credit

221 855. Inorganic Techniques. (2-3) S. A graduate level course in the preparation of inorganic compounds which are of unusual interest and which present challenges to the student of advanced inorganic laboratory techniques. Six to nine hours lab. a week. Pr.: Chem. 597. 221-855-1-0-1906

221 902. Graduate Seminar in Inorganic Chemistry. (0-1) I, II, S. 221-902-0-1906

221 929. 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.: Chem. 597, 710. 221-929-0-1906

221 931. Theoretical Inorganic Chemistry. (3) II in odd years. Theory of crystal fields and paramagnetic resonance. Three hours lec. a week. Pr.: Chem. 597, 710, 854, 995 or conc. enrollment. 221-931-0-1906

221 935. Selected Topics in Inorganic Chemistry. (1-3) Offered on sufficient demand. 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. 221-935-0-1906

1. A program leading to the B.A. degree can be planned by modifying the social sciences and humanities requirements. See page 101 for specific requirements for the B.A. degree.

2. 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 Chemistry I (Chem. 210) and Chemistry II (Chem. 230). 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. Students are enrolled in the accelerated program by the Chemistry Department and are placed in special sections of Chem. I and Chem. II.

3. All chemistry courses numbered 600 or above require the following as minimum prerequisites: Organic Chem. II (Chem. 550), Organic Chem. II Lab. (Chem. 551), Physical Chem. II (Chem. 595), and Physical Chem. II Lab. (Chem. 598).

Courses in Organic Chemistry

Undergraduate Credit

221 190. Elementary Organic Chemistry. (3) I, II, S. A brief introduction to the principles of organic chemistry for students in certain agriculture and home economics curriculums. Conc. enrollment in Chem. 191 is recommended. Three hours lec. a week. Pr.: Chem. 110. 221-190-0-1907

221 191. Elementary Organic Chemistry Laboratory. (2) I, II, S. Six hours lab. a week. Pr. or conc.: Chem. 190. 221-191-1-1907

221 350. 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 Chem. 351 is urged. Three hours lec. a week. Pr.: Chem. 230. 221-350-0-1907

221 351. General Organic Chemistry Laboratory. (2) I, II, S. Six hours lab. a week. Pr. or conc.: Chem. 350. 221-351-1-1907

Undergraduate And Graduate Credit In Minor Field

221 531. Organic Chemistry I. (3) I. 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. Recommended for others who desire a more thorough course than the preceding ones. Three hours lec. a week. Pr.: Chem. 250 or 271. Conc. enrollment in Chem. 532 is recommended. 221-531-0-1907

221 532. Organic Chemistry I Laboratory. (2) I. Six hours lab. a week. Pr. or conc.: Chem. 531. 221-532-1-1907

221 550. Organic Chemistry II. (3) I, II. Cont. of Chem. 531, including additional aromatic chemistry, condensation reactions and introduction to some advanced topics, such as dyes, polymers and heterocyclic chemistry. Conc. enrollment in Chem. 551 is recommended. Three hours lec. a week. Pr.: Chem. 531 and 532. 221-550-0-1907

221 551. Organic Chemistry II Laboratory. (2) I, II. Six hours lab. a week. Pr. or conc.: Chem. 550. 221-551-1-1907

Graduate Credit

221 852. Systematic Organic Chemistry. (3) II. Advanced study of organic compounds and fundamental types of reactions. Three hours lec. a week. Pr.: Chem.[3] 221-852-0-1907

221 860. Advanced Organic Chemistry. (3) I. Conditions, scope, and applications of reactions useful in synthetic organic chemistry. Three hours lec. a week. Pr.: Chem.[3] 221-860-0-1907

221 903. Graduate Seminar in Organic Chemistry. (0-1) I, II. 221-903-0-1907

221 905. Current Organic Literature. (0-1) I, II, S. Topics of current interest in organic chemistry will be presented and critically discussed by graduate students and faculty. Max. two hr. credit in M.S. program, four hr. in Ph.D. program. Pr.: Enrollment as graduate student in organic chemistry. 221-905-0-1907

221 965. Theoretical Organic Chemistry I. (3) II. Bond structure, stereo-chemistry, relation of constitution to physical properties, solvents, and other general topics of a theoretical nature. Three hours lec. a week. Pr.: Chem.[3] 221-965-0-1907

221 967. Theoretical Organic Chemistry II. (3) I. The principal mechanisms of organic reactions and various types of evidence for them. Recent developments are followed in the current literature. Three hours lec. a week. Pr.: Chem. 965. 221-967-0-1907

221 970. Selected Topics in Organic Chemistry. (1-3) Offered 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. Pr.: Chem.[3] 221-970-0-1907

Courses in Physical Chemistry

Undergraduate And Graduate Credit In Minor Field

221 500. Descriptive Physical Chemistry. (3). Elementary principles of physical chemistry without higher mathematical applications. Three hours lec. a week. Pr.: Chem. 271, Math. 100. 221-500-0-1908

221 535. Radioactive Tracer Techniques. (3) II. Chemistry and physics of radioactive substances and applications to fields of biological and physical science. Two hours lec. and three hours lab. a week. Pr.: Consent of instructor. 221-535-1-1908

221 585. Physical Chemistry I. (3) I, S. Properties of matter in the gaseous state; kinetic and statistical theory; elementary quantum chemistry; elementary thermodynamics, including the statistical interpretation. Three hours lec. a week. Pr.: Chem. 230, Math. 222, Phys. 214. 221-585-0-1908

221 586. Physical Chemistry I Laboratory. (2) I. Six hours lab. a week. Pr.: Chem. 250 or 271 and Chem. 585 or conc. enrollment. 221-586-1-1908

221 595. Physical Chemistry II. (3) II, S. Thermodynamics and chemical equilibrium; reaction kinetics and mechanisms; elementary quantum theory of molecular structure and chemical bonding; properties of the solid state. Three hours lec. a week. Pr.: Chem. 585. 221-595-0-1908

221 598. Physical Chemistry II Laboratory. (2) II. Six hours lab. a week. Pr.: Chem. 595 or conc. enrollment. 221-598-1-1908

Undergraduate And Graduate Credit

221 720. Electrochemistry. (3) II in even years. Fundamentals of electrochemistry and their applications. Two hours rec. and three hours lab. a week. Pr.: Chem.[3] 221-720-1-1908

Graduate Credit

221 801. Chemical Thermodynamics. (3) II in odd years. The laws, principles, and methods of thermodynamics and their applications to chemical systems, both pure and of variable composition. Introductory statistical-molecular approach also included. Three hours lec. a week. Pr.: Chem.[3] 221-801-0-1908

221 802. Chemical Kinetics. (3) II. Survey of experimental and/or theoretical aspects of dynamics of chemical reactions. The topics presented will depend upon the instructor. Three hours lec. a week. Pr.: Chem.[3] 221-802-0-1908

221 854. Molecular Structure. (3) I. Introduction to quantum mechanics and atomic and molecular spectroscopy. Three hours lec. a week. Pr.: Chem.[3] 221-854-0-1908

221 904. Graduate Seminar in Physical Chemistry. (0-1) I, II, S. Presentation of topics from literature in physical chemistry. 221-904-0-1908

221 950. Chemical Statistical Thermodynamics. (3) II in even years. Application of classical and quantum statistical mechanics to chemical phenomena. Three hours lec. a week. Pr.: Chem. 801, 854. 221-950-0-1908

221 955. Selected Topics in Physical Chemistry. (1-3) Offered 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.: Chem.[3] 221-955-0-1908

221 995. Theoretical Chemistry I. (3) II. Principles of diatomic and polyatomic molecular spectroscopy and chemical bonding. Three hours lec. a week. Pr.: Chem. 854 or consent of instructor. 221-995-0-1908

221 996. Theoretical Chemistry II. (3) I. Development of the basic principles of quantum mechanics and application to problems of energy states of atoms and molecules. Three hours lec. a week. Pr.: Chem. 854 or consent of instructor. 221-996-0-1908

COMPUTER SCIENCE

Paul S. Fisher, Head of Department

At KSU: Professor Fisher;* Associate Professors Calhoun,* Conrow,* Gallagher,* Hankley,* Unger, and Wallentine;* Assistant Professors Gustafson, Maryanski,* Miller, Shapiro;* Instructor Basham.

At KU: Professors Bavel,* Bulgren,* Horowitz,* Jones,* Schweppe,* S. Sedelow,* W. Sedelow,* and Wallace;* Associate Professors Hetherington,* Lien,* Mansfield,* and Tuggle;* Assistant Professors Horgan,* and Muchnick.*

Undergraduate Study

The first digital computer was demonstrated in 1944; today there are thousands of such computers

in use throughout the world. It has been estimated that one-third of all jobs now involve some use of, or interaction with, computers. That figure is expected to climb to more than 80 percent by 1984. This wide use of computers will be supported by increasing numbers of computer terminals and personal minicomputers in stores, banks, schools, libraries, and even in homes and on farms. In spite of the great hardware (electronic) aspect of computers, computers owe their power to people. People create application systems; they design, sell, manage, and program compuer systems; they supply and use data and information to and from computers.

The creation and utilization of the best possible hardware and software is, broadly speaking, the field of computer science.

The program of study in computer science prepares a student for careers in scientific and business applications programming, systems programming and analysis, marketing and sales, and management. Career opportunities for both men and women are excellent. Many other fields increasingly require a minor emphasis in compuer science, and students working toward a dual degree (one in computer science and one in some other field) are increasingly more common.

The department has several mini-computers (Interdata 8/32, 7/16, 7/32; NCR 8250; Nova 2/10) and several micro-computers, a graphics terminal, and several typewriter-like terminals for personal access to either the IBM/S370 computer at KSU or the Honeywell 66/60 computer at KU. There are also a card reader and a line printer in the computer science building which provide remote access to the IBM/S370.

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; complete Math 220 and 221 and either 224 or 551; Electrical Engineering 241; Computer Science 200, one language laboratory, 300, 305, 405, 420, 505, 560, and 580, plus 15 additional hours of technical electives which are approved by the student's adviser. Required courses may not be taken under the credit-no-credit option.

Graduate Study

The Department of Computer Science offers graduate studies leading to Master of Science and Doctor of Philosophy degrees. A minimum of 30 semester hours of graduate course work, including CS897, Seminar in Computer Science and CS670, Discrete Computational Structures, is required for the master's degree. Either a thesis, a written report, or a publishable paper is required as well as satisfactory performance on a master's examination. The master's examination covers areas of data bases, programming languages, operating systems, and software engineering

The Doctor of Philosophy degree 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 completion of the master's examination at a level specified for Ph.D. candidacy; selection of a research supervisory committee; completion of written preliminary examinations in three areas supportive of the student's proposed research area; and presentation of a proposal for Ph.D. research. Completion of the doctoral degree requires 24 semester-hours of course work beyond the master's degree at KSU or KU (which must include four computer science courses at the 900 level), a minimum of 30 hours of research, and presentation and defense of the dissertation. Courses at the 900 level will be offered on a two-year rotation schedule.

Central areas of research emphasis at KSU include: programming languages and language processors; operating systems; software engineering; computer architecture; numerical methods and software development.

Areas of current research include: minicomputer networks; business and data base systems using minicomputers; numerical solution of differential equations; image recognition and graphics; systems simulation and modeling.

Courses in Computer Science

Undergraduate Credit

286 100. Computing Appreciation.(3) I, II. Introduction to the use of computers including programming, problem solving capabilities, current applications, and impact of this technology on individuals and society. 286-100-0-0701

286 200. Fundamentals of Computer Programming. (2) I, II, S. History of computers, description of digital computing systems, strategy of problem solving using digital computers, concepts and properties of algorithms, introduction to procedure-oriented languages, relevance of computers to society. Pr.: Algebra, plus conc. enrollment in one C.S. Language Lab. 286-200-0-0704

286 201. FORTRAN Language Laboratory. (2) I, II, S. Fundamentals of programming in FORTRAN; applications. Six hours lab. a week. Pr. or conc.: C.S. 200. 286-201-1-0-0704

286 202. PL/1 Language Laboratory. (2) I, II, S. Fundamentals of programming in PL/1; applications. Six hours lab. a week. Pr. or conc.: C.S. 200. 286-202-1-0-0704

286 203. APL Language Laboratory. (2) I, II. Fundamentals of programming in APL; applications. Six hours lab. a week. Pr. or conc.: C.S. 200. 286-203-1-0-0704

286 205. COBOL Language Laboratory. (2) I, II. Fundamentals of programming in COBOL; applications. Six hours lab. a week. Pr. or conc.: C.S. 200. 286-205-1-0-0704

286 206. BASIC Language Laboratory. (2) I, II. Fundamentals of programming in BASIC; applications. Six hours lab. a week. Pr. or conc.: C.S. 200. 286-206-1-0-0704

286 211. FORTRAN Laboratory for Engineering Majors. (1) I, II. Fundamentals of programming engineering applications in FORTRAN. Pr. or conc.: C.S. 200. 286-211-1-0-0704

286 300. Algorithmic Processes. (3) I, II. Development and refinement of structured design and coding of algorithms, applied programming utilizing file handling, preprocessors, debugging aids, and other system features; solution of computation problems using PL/I. Pr.: One C.S. Language Laboratory. 286-300-1-0-0704

286 305. Computer Organization and Programming I. II. (3) I, II. Introduction to assembly languages; logical computer organization; instruction sequencing; addressing systems; subroutine linkages and command languages for several mini-computers and IBM S360/S370 computers. Each subject is developed by student computer programs. Pr.: One C.S. Language Lab. Pr. or conc.: E.E. 241. 286-305-0-0704

286 306. Operating Systems Laboratory. (3) II. Advanced programming laboratory for experience in O/S 360/370, job control language, utilities, and access methods. Pr.: C.S. 305. 286-306-0-0704

286 397. Seminar in Computer Science. (1-3). 286-397-3-0701

286 405. Introduction to Programming Languages. (3) I. Structure of algorithmic, conversational, list processing and string manipulation languages; concepts and facilities of programming languages; structure of compilers; Introduction to formal languages and parsing. Pr.: C.S. 300. 286-405-0-0701

286 420. Operating Systems I. (3) II. Basic systems concepts: assemblers, linking loaders, batch monitors, interrupt systems, input/output systems, and files; procedure implementation; process parallelism and synchronization; memory and name management. Pr.: C.S. 305 286-420-0-0701

Undergraduate And Graduate Credit In Minor Field

286 505. Computer Organization and Programming II. (3) II. Advanced computer organization topics including channel organization, input/output processing, mircoprogramming, assemblers and macro processors, virtual systems, peripheral devices. Examples on both minicomputers and IBM 360/370 series. Pr.: C.S. 305. 286-505-0-0701

286 560. Data Structures. (3) I, II. Study of list, string, array and graph structures within a computer; memory management. Pr.: C.S. 300. 286-560-0-0701

286 580. Numerical Computing. (3) II. 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.: One C.S. Language Lab. and Math 224 or 551. 286-580-0-0701

Undergraduate And Graduate Credit

286 640. Introduction to Software Engineering. (3) I. Software design; program specification; proofs of programs; structured programming; top-down design; modular organization; program style, debugging, testing, and documentation; management of programming teams; aids for software construction; planning, estimates, and evaluation of performance; team project. Pr.: C.S. 300. 286-640-0-0701

286 658. Microcomputer Programming and Applications. (2) I, II. Organization and programming of a typical microcomputer. One hour lec. and three hours lab. each week. Pr.: E.E. 241 and conc. enrollment in E.E. 648. 286-658-0-0704

286 662. 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.: C.S. 200. 286-662-0-0723

286 665. Computer Installation Management. (3) I. Computer selection, personnel organization and management, budget, optiminzing system operation, PERT. Students plan, recommend and defend small data processing systems. Pr.: C.S. 300. 286-665-0-0705

286 670. Discrete Computational Structures. (3) I. Introduction to theoretical foundations of computer science; computational and representational aspects of graphs, formal languages, Boolean algebras, propositional calculus, combinatories, and discrete probability. Pr.: Junior standing. 286-670-0-0702

286 680. Searching Procedures. (3). Design and implementation of procedures and algorithms for numerical and semi-numeric searching; mathematical programming; interactive searching with programming projects primarily using the language APL. Pr.: C.S. 580. 286-680-0-0701

286 690. 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, mini-computer operating systems, graphics, numerical software, etc. Pr.: Junior standing. 286-690-3-0799

286 697. Seminar in Computer Science. (1-3). Pr.: Junior standing. 286-697-3-0701

286 700. Translator Design I. (3). Language structure and meaning; associated recognition algorithms, and interpreters. Emphasis on construction of a translator or an interpreter for a programming language. Pr.: C.S. 405 and 560. 286-700-1-0-0701

286 710. Computer Simulation Experiments. (3) I. Principles of digital computer simulations; discrete and continuous simulation method, statistics of simulations; implementations. Pr.: C.S. 300. 286-710-0-0701

286 720. Operating Systems II. (3). Design of executive systems, scheduler strategies for central processor, system integrity (protection), methods of system development, languages for system implementation. Pr.: C.S. 420 and 560. 286-720-0-0701

286 725. Computer Networks. (3) II. Models of distributed computer systems; layering of protocols for networks, interprocess communication, study of current networks, network operating system protocol, experience on a state-of-the-art network. Pr.: C.S. 720. 286-720-0-0701

286 730. Artificial Intelligence. (3). Application of heuristics to problem solving; perceptions and pattern recognition; learning and self-evolving programs. Pr.: C.S. 560. 286-730-0-0701

286 736. Computer Graphics. (3) I. Computer representation and display of line drawings gray-tone images; man-machine interaction; graphics language; transformations, clipping, hidden line removal; designing of image processing software. Pr.: C.S. 560. 286-736-0-0702

286 750. Advanced Computer Architecture Experiments. (3) II.Characteristics of various computers including those with execution support of multi-processing, multi-programming, micro-programmable, high-level language, stack processing and communication architectures. Two hours lec. and three hours lab. each week. Pr.: C.S. 305 and E.E. 641. 286-750-0-0701

286 761. Data Base Management Systems. (3) I. Data models and languages, heirarchical, network, relational systems; implementation and operational requirements; programming projects using data base management systems. Pr.: C.S. 560. 286-761-0-0702

286 765. Systems Analysis for Business. (4). 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. Three hours lec., two hours lab. a week. Pr.: C.S. 560. 286-765-0-0703

286 780. Numerical Solution of Ordinary Differential Equations. (2). Computer algorithms and techniques for solving ordinary differential equations; programming exercises on the digital computer. Pr.: One C.S. Language Lab. and Math. 555 or C.S. 580 and Math. 240 plus concurrent enrollment in Math. 780. 286-780-0-0701

286 785. Numerical Solution of Partial Differential Equations. (2). Computer algorithms and techniques for solving partial differential equations; programming exercises on the digital computer. Pr.: C.S. 780 & Math. 780 plus concurrent enrollment in Math. 785. 286-785-0-0701

286 791. Intensive Computer Science: Concepts. (1-3) I, II, S. Principles of data structure, assembler language programming, structure of operating systems and programming languages. Intended for entering graduate students in computer science. Pr.: C.S. 300. 286-791-0-0704

286 798. Topics in Computer Science. (Var.) I, II, S. Pr.: Prerequisite varies with the announced topic. 286-798-3-0701

Graduate Credit

286 800. Theory of Parsing. (3). Introduction to formal language and automata theory; theoretical study of parsing techniques. Pr.: C.S. 405 and 670. 286-800-0-0701

286 806. Semantics of Programming Languages. (3) Alternate years. User view of semantic models, comparative analysis of programming language features; implementation models; comparison of control languages. Pr.: C.S. 640 and C.S. 700. 286-806-0-0701

286 820. Introduction to Operating Systems Theory. (3). Theoretical treatment of process synchronization, multiprocessors, resource allocation, scheduling theory, evaluation techniques for hierarchial memory and machines. Pr.: C.S. 405, 420, and 560. 286-820-0-0705

286 840. Advanced Concepts in Software Engineering. (3) II. System requirements definition, design and verification, definition and implementation tools, softweare physics. P.r.: C.S. 640. 286-840-0-0704

286 870. Automata and Computability I. (3). Elements of abstract algebra; review of finite automata; recursive functions and programmed machines; computable functions, loop programs and primitive recursive functions, theses of Turing and Church. Pr.: C.S. 700. 286-870-0-0701

286 875. Automata and Computability II. (3). Problems in unsolvability; topics in computability; cellular automata; student produces term paper or project. Pr.: C.S. 870. 286-875-0-0701

286 890. 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. 286-890-0-0701

286 891. Intensive Computer Science: Applications. (3) I, II, S. Intensive course in design of algorithms, programming, JCL, and program libraries. Meets four hours each week. Not for credit for C.S. majors. Pr.: Graduate stunding in student's own area. 286-891-0-0704

286 897. Seminar in Computer Science. (1-3) I, II. Required for graduate students in computer science. Pr.: Full graduate standing in C.S. 286-897-3-0701

286 898. Master's Report in C.S. (1-2) I, II, S. Pr.: C.S. 897. 286-898-3-0701

286 899. Research in Computer Science. (1-6) I, II, S. Pr.: C.S. 897. 286-899-4-0701

286 900. Translator Design II. (3) Alternate years. Several topics in translator construction involving incremental, extensible and conversational compilers, and translator writing systems. Pr.: C.S. 700 and C.S. 806. 286-900-0-0701

286 905. Theory of Programming Languages. (3) Alternate years. Formal definition languages; operational and formal semantic models; equivalence of semantic models; formal properties of programming languages. Pr.: (C.S. 640 or C.S. 670) and C.S. 806. 286-905-0-0701

286 920. 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.: C.S. 720 and 806 and Stat. 510. 286-920-0-0701

286 926. Computation Structures. (3) Alternate years. Petri nets, flowgraph schemata, dataflow models; relationships between abstract computational models and hardware models and programming languages. Pr.: 670 and C.S. 750 and C.S. 820. 286-926-0-0701

286 930. Pattern Recognition and Image Processing. (3) Alternate years. Research topics in pattern recognition and image anaylsis; feature extraction, clustering, synactic recognition, enhancement, edge detection, segmentation, shape and texture anaylsis. Experiments on image data. Pr.: C.S. 730 and C.S. 736. 286-930-0-0701

286 940. Theory of Software Engineering. (3) Alternate years. Models of software; error models; theory of verification and validation; language structure for reliable software. Pr.: C.S. 840. 286-940-0-0701

286 960. Theory of Data Base Systems. (3) Alternate years. Advanced topics in data base systems including distributed data bases, integrity, security, normalization, data base machines, performance models, query languages. Pr.: C.S. 761. 286-960-0-0702

286 990. Research Topics. (2-3) I, II, S. Study of current topics in computer science. Pr.: Consent of instructor. 286-990-0-0701

286 999. Research in Computer Science. (Var.) I, II, S. Pr.: C.S. 897. 286-999-4-0701

ECONOMICS

Paul L. Kelley, Head of Department*
Edgar S. Bagley, Assistant Head, Teaching and Graduate Studies*
Donald B. Erickson, Assistant Head, Extension Program*

Professors Bagley,* Chalmers,* Emerson,* and Nordin;* Associate Professors Gormely,* Nafziger* and Thomas;* Assistant Professors Akkina,* Babcock,* Haggart, Kennedy,* Olson;* and Ragan.* Instructors Bradley Higham, and Hill. Emeritus: Associate Professor Decou.*

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 the fields of economic theory, history of economic thought, money and banking, public finance, labor relations, international trade, economic development, business fluctuations, transportation, econometrics, regional economics and economic systems.

A major in economics will help prepare a student for a career in business, in government or in education. The study of economics also will be useful to a student in acquiring the background needed as a citizen for understanding problems of our society and appraising policies of governments.

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 Economics 110 and Economics 120, or equivalent courses, and College Algebra.

Undergraduate Study

Requirements for an economics major for either the B.A. or B.S. degree (see page 94) are (1) Econ. 110, 120, 510, 520, (2) five additional courses numbered 500 or above in the Department of Economics in at least four branches of economics. Economics 512, 505 and 506 cannot be counted in fulfillment of this

requirement, (3) Stat. 330 or 350, and (4) one of the following: Math 220 or 500; Bus. Admin. 260; Stat. 351, 702, or 703. Courses taken credit-no credit may not be used to fulfill these requirements.

Secondary Education Certification. A student majoring in economics may also prepare for teacher certification at the secondary level (see page 211). This program leads to the Bachelor of Science degree (see page 101). The sequence of courses should be planned in cooperation with the student's advisers in both economics and education so that the requirements of secondary education are met (see page 211).

Industrial Relations and Manpower Studies Students planning to work in the industrial relations or manpower development utilization field (holding a government, industrial, or trade union position) 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, 627; Soc. 746, 747; Pol. Sc. 704; B.A. 530, 531, 630, 631, 632.

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. in economics or to a B.S. in agricultural economics at the end of four years and a Master of Arts in economics or a Master of Science in agricultural 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 adviser will plan an individualized program of study which meets requirements for the B.A., M.A. and B.S., 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.

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, history of economic thought, econometrics, regional economics, labor economics, monetary and fiscal policy, economic development, international trade, welfare economics, economic fluctuations, public finance and transportation.

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.

Research facilities available to graduate students include modern electronic computers.

Opportunities for advanced study are enhanced by close contacts with the agricultural economics section of the department, with the College of Business Administration, with the Agricultural and Engineering Experiment Stations, and with the various state agencies.

Courses in Economics

Undergraduate Credit

225 110. 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. 225-110-0-2204

225 111. Economics I Honors. (3) I. Course description same as Econ. 110. (3) I, II, S. Pr.: Open to students in Honors Program. 225-111-0-2204

225 112. Economics Seminar for Education Majors. (1) I, II. For elementary and secondary education majors for the purpose of relating economic concepts and theory of Econ. 110 to the teaching areas of the education student. If not taken concurrently with 225-110, instructor's permission required.

225 120. 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. 225-120-0-2204

225 399. Honors Seminar in Economics. (2) I 1978. Readings and discussions. Open to students in the Honors Program not majoring in economics. 225-399-0-2204

225 499. Seniors Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences honors program. 225-499-0-2204.

Undergraduate And Graduate Credit In Minor Field

225 505. Introduction to the Civilization of South Asia I. (3) I. Interdisciplinary survey of the development of civilization in South Asia, geographical and demographic context, philosophical and social concepts, economic, social and political institutions, literature and historical movements. (Same as Hist. 505, P. Sci. 505, Soc. 505, Anthro. 505.) 225-505-0-2204

225 506. Introduction to the Civilization of South Asia II. (3) II. Interdisciplinary survey of recent and contemporary civilization in India, Pakistan, Ceylon, Nepal, and Afghanistan, including recent history, current economy, religion, culture, languages and literature, geography, social and political structures and ideas. (Same as Hist. 506, P. Sci. 506, Soc. 506, Anthro. 506.) 225-506-0-2204

225 510. 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. 225-510-0-2204

225 520. Intermediate Microeconomics. (3) I, II. 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. 225-520-0-2204

225 530. 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. 225-530-0-2204

225 532. Fiscal Operation of State and Local Government. (3) II. 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. 225-532-0-2204

225 555. 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. 225-555-0-2204

Undergraduate And Graduate Credit

225 620. 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; theories of the labor movement and history of trade unions in the U.S.; current issues. Pr.: Econ. 120 or consent of instructor. 225-620-0-2204

225 627. Contemporary Labor Problems. (3) II. Emphasis on current research and public policies dealing with such matters as full employment, poverty and discrimination, impact of automation and technological change on the labor force, work orientations, women in the work force, labor market problems of minority groups, training, retraining and education. Pr.: Econ. 620 or consent of instructor. 225-627-0-2204

225 631. 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. 225-631-0-2204

225 633. Public Finance. (3) I, II, S. Course seeks answers to questions such as: What is an equitable and efficient tax system? Who bears the tax burden? How should we spend public funds? How can government influence prices and employment? Pr.: Econ. 110. 225-633-0-2204

225 636. 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. 225-636-0-2204

225 640. 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. 225-640-0-2204

225 681. 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. 225-681-0-2204

225 682. 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. 225-682-0-2204

225 686. 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. 120. 225-686-0-2204

225 690. Monetary, Credit, and Fiscal Policies. (3) II. Goals of aggregative economic policy, conflicts among goals, and measures to resolve conflicts; money markets; tools and targets of central bank control; the relative strength of monetary and fiscal policies; management of the public debt; term structure of interest rates. Pr.: Econ. 530. 225-690-0-2204

225 699. Seminar in Economics. (1-3) Offered on sufficient demand. Seminars of special interest will be offered on demand. Pr.: Econ. 120. 225-699-0-2204

225 730. Introduction to Econometrics. (1-3) II, some S. Analytical and quantitative methods used in economics. Applications to specific problems. Pr.: Math. 220 or 500 and Stat. 702 or 703 or consent of instructor. 225-730-0-2204

225 735. Mathematical Economics. (3) I. Application of mathematical tools of concrete problems in micro and macroeconomics; mathematical treatment of models of consumption, production, market equilibrium and aggregate growth. Pr.: Econ. 520, Math. 221 or 500 or consent of instructor. 225-735-0-2204

225 740. Managerial Economics. (3) Offered on sufficient demand. A study of maximizing an individual business firm's profits under conditions of (a) fixed supply and (b) variable supply for (1) a fixed time period and (2) multiple time periods. A critical appraisal will be made of efforts of business firms to increase profits by affecting the position and slope of the demand schedule for their products by different patterns of expenditure or advertising and selling. Pr.: Econ. 520. 225-740-0-2204

225 795. Problems in Economics. (Var.) I, II, S. Advanced study on an individual basis is offered in money and banking, public finance, general economics, international trade, labor relations, transportation. Pr.: Background of courses needed for problem undertaken. 225-795-3-2204

Graduate Credit

225 801. Topics in Monetary Theory. (3) I (even numbered 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. 225-801-0-2204

225 805. 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. 225-805-0-2204

225 810. History of Economic Thought. (3) I, some S. Development of economic ideas and doctrines and the relation of these to conditions existing when they were formulated. Pr.: Econ. 110. 225-810-0-2204

225 815. Value and Distribution Theory. (3) I. Neoclassical value and distribution theory; theories of imperfect competition; introduction to general equilibrium theory and dynamic analysis. Pr.: Econ. 520 or consent of instructor. 225-815-0-2204

225 823. 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. 225-823-0-2204

225 832. Public Sector Analysis I. (3) II in odd numbered years. Conditions for economic efficiency in the public sector; public good production functions; non-market decision making; rationale for public sector growth; systems analysis, cost-benefit and related techniques of allocating public goods. Pr.: Econ. 633 and 815. 225-832-0-2204

225 833. Public Sector Analysis II. (3) II in even numbered years. Conditions for economic efficiency in the public sector; effect of specific taxes on (1) allocation of resources, (2) distribution of income, (3) rate of revenue growth; analysis of tax shifting and incidence; intergovernmental fiscal relations. Pr.: Econ. 815 and 832. 225-833-0-2204

225 860. Growth and Development Theories. (3) II. Advanced theories of economic growth; 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. 225-860-0-2204

225 880. Seminar in Economics. (3) I, II. Special topics in economic theory. Pr.: Graduate standing. 225-880-0-2204

225 898. Research in Economics. MA—Master's report. 225-898-4-2204

225 899. Research in Economics. MA—Research for Master's thesis. 225-899-4-2204

225 905. 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. 225-905-0-2204

225 920. Labor Economics Seminar. (3) I. A critical analysis of wage theories, collective bargaining and unemployment problems. Pr.: Econ. 620 or consent of instructor. 225-920-0-2204

225 925. 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. 225-925-0-2204

225 935. Econometric Methods. (3) I. Quantitative methods of research used in economics. Pr.: Econ. 730 or consent of instructor. 225-935-0-2204

225 940. Economic Welfare and Public Policy. (3) II (odd numbered years). Theory of welfare economics, with application to current economic problems and policy. Pr.: Econ. 815 or consent of instructor. 225-940-0-2204

225 945. Advanced Economic Theory. (3) II. A study of traditional theories of a firm and competitive market in the light of contemporary thought. General equilibrium theory. Modern microeconomic theories, with attention given to risk and uncertainty. Pr.: Econ. 815. 225-945-0-2204

225 955. 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. 225-955-0-2204

225 999. Research in Economics. PhD—Research for PhD dissertation. 225-999-4-2204

ENGLISH

Richard D. McGhee, Head of Department*
Jerome Dees, Assistant Head*

Professors Higginson,* McCarthy,* Moses,* Noonan,* and Rogerson;* Associate Professors Adams,* Ansdell,* Carpenter,* Chapman, Eitner,* Grindell,* Johnston,* Keiser,* Koch,* McGhee,* Nyberg,* Rees,* M. Schneider,* Stewart;* Assistant Professors Agosta, Brondell,* Cohen, Conrow,* Dees,* M. Donnelly,* Evans, Gillespie, Geissler, Hedrick, Matherne,* H. Schneider, and L. Warren.* Instructors Baker, Burke, Bussing, Clark, K. Donnelly, Rochat and A. Warren. Emeritus: Professors Aberle and Davis; Associate Professor Jones and White; Assistant Professors Glenn and Laman; Instructors Bergman, Vance and Pelischek..

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:

I. Literature

9 hours—core courses*
6 hours—one sequence of survey courses (English 260 and 265, or 280 and 285)
12 hours—four 3-credit courses from 600-799 offerings.

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.

6 hours—electives at the 500 level or above, except that **one** course from the Introduction to Genres listings (English 310, 320, 340, 345) **or one** course from the Humanities sequence (English 230, 231, 233, 234, 492) **or** a third survey (260, 265, 280, or 285) may be substituted.

33 hours Total

A student must take at least six hours of American Literature in the total program.

II. Literature and Creative Writing

9 hours—core courses*
6 hours—any two survey courses (English 260, 265, 280, and 285)
6 hours—two 3-credit courses in literature and English language from the 600-799 offerings

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.

3 hours—Introduction to Creative Writing
9 hours—three 3-credit courses in writing at the advanced level, in at least two genres.

33 hours Total

A student must take at least six hours of American Literature in the total program.

*Core: 3 hours—Forms of Literature (229-250)
3 hours—Shakespeare
3 hours—one of the following:
229 300 English Language Study
229 530 Modern English Grammar
229 780 Introduction to Linguistics
229 790 History of the English Language

III. Literature with Teaching Certification

3 hours—Forms of Literature (229 250)
3 hours—Shakespeare
3 hours—Modern English Grammar
6 hours—any two Survey courses (English 260, 265, 280, and 285)
9 hours—three 3-credit courses from the 600-799 offerings.

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.

3 hours—Advanced Composition
3 hours—Literature for Adolescents
6 hours—electives at the 500 level or above, except that **one** course from the Introduction to Genres listings (English 310, 320, 340, 345) **or one** course from the Humanities sequence (English 230, 231, 233, 234, 492) **or** a third survey (260, 265, 280, or 285) may be substituted.

36 hours Total

A student must take at least six hours of American Literature in the total program.

Teacher Certification

Students preparing to teach English in high school may adopt either of two programs: (1) the regular major outlined in III above, leading to the B.A. degree, or (2) the major in Secondary Education, leading to the B.S. degree. Either degree may provide for teaching certification. Regular majors desiring certification should consult their advisers in the English department.

The department offers many general education courses for the non-major student. All are intended to introduce such students to the appreciation of literature. Examples are: English 210, 220, 230, 231, 233, and 234; 310; 320; 340; 345; 350; 360; 365; 370; 375; 387; 388; 492; 505, 510; 515; 520; 560; 570; 580; 702; 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 English 230, 231, 233, 234, 310, 320, 340, 345 and 492 may be taken for major credit.

Graduate Study

Both the M.A. and the Ph.D. are awarded by the department. For the Ph.D., the emphasis may be on either English or American literature; for the M.A., the emphasis may be on one of the two literatures, or on creative writing or linguistics.

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. The Graduate Record Examination is required of doctoral applicants; 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.Creative writing students may substitute Old English (229 810)) for the language requirement. A written and an oral examination are required (though the oral is often waived). A two-hour report is required (except in the linguistics option where a student writes a six-hour thesis instead), as are Engl. 790 (unless waived) and 802.

Requirements for the Ph.D. include some 60 semester hours of course work and 30 of research on the dissertation. Candidates must demonstrate competence in two foreign languages or in one foreign language plus a specified substitute for the second, or fluency in reading a single foreign language, to the degree expected of entering graduate students in that language. They must pass a written preliminary examination and write an acceptable dissertation and defend it in a final oral examination.

For more detailed and current information about either the M.A. or the Ph.D., consult the Chairman of Graduate Studies, Department of English.

Courses in English

Undergraduate Credit

229 030. Writing Laboratory. (2) I, II, S. Credit/No Credit. Laboratory practice in writing for all students who need review in fundamentals of composition. Especially designed 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. 229-030-1-1501

229 075. English for Foreign Students. (3) I, II, S. Review of English structure for students whose first language is not English; designed to improve understanding and written expression. While hours will count in the grade-point average, hours are not applicable toward degree requirements. Required of all students not making a satisfactory TOEFL or ETS score. Students may also be admitted on recommendation of their adviser. 229-075-0-1508

229 100. 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 non-fiction prose. Theme and paragraph organization and the basic elements of sentence structure and grammar receive emphasis. 229-100-0-1501

229 110. English Composition IH. (3) I, II, S. 229-110-0-1501

229 111. English Composition IS. (3) I. Reading and composition for freshmen. Composition IH is for freshmen who score high on their entrance examination in English and who are interested in pursuing a more sophisticated and challenging program than that of I. Composition IS is open only to students in the Arts and Sciences Honors Program. 229-111-0-1501

229 120. 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. 229-120-0-1501

229 125. English Composition IIH. (3) II. Continues Engl. 110. 229-125-0-1501

229 126. English Composition IIS. (3) II. Continues Engl. 111. Engl. 120 concentrates on critical reading and evaluation. Engl. 125 and 126 place an emphasis on literary forms and themes. Students who have taken Engl. 100 may, on the recommendation of their instructor, be admitted to Engl. 125. Otherwise, admission is on a similar basis to that for Engl. 100, 110, and 111. 229-126-0-1501

229 200. English Composition III. (3) I, II, S. Advanced exposition and argumentation. Pr.: Engl. 120, 125 or 126. 229-200-0-1501

229 210. 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. 229-210-0-1502

229 220. Fiction into Film. (2) I, II, S. Credit/No Credit only. Discussions of film adaptation of works of literature. Not for major credit. 229-220-0-1501

229 230. Humanities: Classical Cultures. (3) I, S. 229-230-0-4901

229 231. Humanities: Medieval and Renaissance. (3) II, S. 229-231-0-4901

229 233. Humanities: Baroque and Enlightenment. (3) I, S. 229-233-0-4901

229 234. 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. 229-234-0-4901

229 250. Forms of Literature. (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 in various kinds of literary work, and thus as an introduction to literary terms commonly used in later courses. Readings from a broad range: poems, plays, essays and novels. Pr.: Engl. 100, 110 or 111. 229-250-0-1502

229 260. British Survey I. (3) I, II, S. English literature from Anglo-Saxon times through Milton. Not designed for the general student. Pr.: Engl. 120, 125 or 126. 229-260-0-1502

229 265. British Survey II. (3) I, II, S. English literature from Dryden to the end of the nineteenth century. Not designed for the general student. Pr.: Engl. 120, 125 or 126. 229-265-0-1502

229 280. American Survey I. (3) I, II, S. An introductory review of our literary history from the early accounts of colonization through the American Renaissance. Not designed for the general student. Pr.: Engl. 120, 125, or 126. 229-280-0-1502

229 285. American Survey II. (3) I, II, S. An introductory review of our literary history from the Civil War to the present. Not designed for the general student. Pr.: Engl. 120, 125 or 126. 229-285-0-1502

229 300. English Language Study. (3) I, II, S. Survey of the principal areas of English language study including American dialects, backgrounds of modern English, and language in literature. Pr.: English 120, 125, or 126. 229-300-0-1505

229 301. Writing and the Law: Legislative Analysis. (3) I, II. Practice in critizing 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, 125, or 126. 229-301-0-1501

229 310. Introduction to Fiction. (3) I, II. Selected short stories, novellas and novels from world literature, with emphasis on the present. Concern for the forms of fiction and critical analysis. Pr.: Engl. 120, 125 or 126, or consent of instructor. 229-310-0-1501

229 320. Introduction to the Short Story. (3) I, II, S. American, British and Continental stories are studied. Pr.: Engl. 120, 125 or 126. 229-320-0-1501

229 340. Introduction to Poetry. (3) I, II, S. Close reading of poems and analysis of poetic genres, with emphasis on modern poetry. Pr.: Engl. 120, 125 or 126. 229-340-0-1502

229 345. Introduction to Drama. (3) I, II. Study of drama from classical times to the present. Pr.: Engl. 120, 125 or 126. 229-345-0-1502

229 350. Introduction to Shakespeare. (3) I, II, S. Study of representative comedies, histories and tragedies. Pr.: Engl. 120, 125 or 126. 229-350-0-1502

229 360. British Literature I. (3) I, II, S. Major works to about 1700, selected for the general student; emphasizing Chaucer, Shakespeare and Milton. Not for English majors. Pr.: Engl. 120, 125 or 126. 229-360-0-1502

229 365. British Literature II. (3) I, II, S. Major works since about 1700, selected for the general student. Not for English majors. Pr.: Engl. 120, 125 or 126. 229-365-0-1502

229 370. American Literature I. (3) I, II, S. Major works selected for the general student. Not for English majors. Pr.: Engl. 120, 125 or 126. 229-370-0-1502

229 375. American Literature II. (3) I, II, S. Major works, including the modern, selected for the general student. Not for English majors. Pr.: Engl. 120, 125 or 126. 229-375-0-1502

229 387. Books and Men I. (3) I, II, S. Introduction to great world classics from past to present. Not for English majors. Pr.: Engl. 120, 125 or 126. 229-387-0-1501

229 388. Books and Men II. (3) I, II, S. Continues Engl. 387. Not for English majors. Pr.: Engl. 120, 125 or 126. 229-388-0-1501

229 395. Topics in English. (0-3) I, II, S. Selected studies in literature and language. Repeatable with change in topic. Pr.: Consent of instructor. 229-395-0-1501

229 399. Honors Seminar in English. (1-3) I, 1978. Readings and colloquia in selected masterpieces. For non-English majors in the Honors Program. May not be used to satisfy the three-course requirement in humanities. Pr.: Honors students only. 229-399-0-1501

229 400. Advanced Composition. (3) I, II, S. Expository writing, primarily for candidates for the teaching certificate in Secondary Education. Pr.: Engl. 120, 125 or 126. 229-400-0-1501

229 401. Writing and the Law: Case Analysis. (3) I in alt. years. Practice in the close reading of judicial opinions, and in criticism and construction of arguments about their bearing on novel fact situations. 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. 229-401-0-1501

229 405. Narrative Writing I. (3) I. Subjects selected from the student's particular field of work; exposition of mechanisms, processes, and general expository writing. Pr.: Consent of instructor. 229-405-0-1507

229 410. Narrative Writing II. (3) I. Narrative writing, both in its relation to the other forms of composition and as an independent form. Pr.: Consent of instructor only. 229-410-0-1507

229 415. 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 229-100 (or equivalent) with A or B credit, or 229-100 and 120 (or equivalents). 229-415-0-1501

229 420. 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.: English 120, 125, or 126. 229-420-0-1501

229 490. Humanities Abroad. (0-6) Intersession and/or S. A concentrated study tour of selected European cultural centers; credit is arranged at the rate of about one credit hour per week abroad. Preliminary attendance for one class study session a week in the preceding semester is required of on-campus undergraduates enrolled in the course. If credit is to be applied toward the degree, at least three hours of appropriate courses in the department are required. 229-490-0-4901

229 492. 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 equivalent background, such as courses in western civilization, art, or world literature, with consent of instructor). 229-492-0-1501

229 499 Senior Honors Thesis (2) I, II, S. Open only to seniors in the Arts and Sciences honors program. 229-499-4-1501

Undergraduate And Graduate Credit In Minor Field

229 500. Introduction to Creative Writing. (3) I, II, S. For those beginning the craft of imaginative writing; a practical introduction to all the major genres. Pr.: Engl. 120, 125, or 126. 229-500-0-1502

229 505. 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, 125, or 126. 229-505-0-1502

229 510. Literary Kinds. (1-3) I, II, S. Examinations of such topics as the characteristics, the growth and development or the uses of specified literary genres. Repeatable with change in topic. Pr.: Engl. 120, 125, or 126. 229-510-0-1502

229 515. 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, 125, or 126. 229-515-0-1502

229 520. 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.: English 120, 125 or 126, or consent of instructor. 229-520-0-1503

229 525. 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.: English 120, 125, or 126

229 530. 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, 125 or 126. 229-530-0-1505

229 540. Literature for Children. (3) I, II, S. A survey of the field of literature for children, providing an opportunity for reading and evaluating books for children. Primarily for teachers of elementary grades and students of child guidance. Pr.: Engl. 120, 125 or 126. 229-540-0-1502

229 545. 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, 125 or 126 and junior standing. 229-545-0-1502

229 560. American Folklore and Folk Literature. (3) I, II, S. Focus on definition, form, and function of folktales and anecdotes, legends, proverbs and riddles, beliefs and customs, folklife and Anglo-American balladry. Pr.: Junior standing. 229-560-0-1502

229 570. English Bible. (3) I, II, S. The Bible as literature and history; cultural and historical backgrounds of the Old Testament. Pr.: Engl. 120, 125 or 126. 229-570-0-1504

229 580. The Epic Tradition. (3) I. Greek and Roman masterpieces in translation as background for the study of literature. Pr.: Junior standing. 229-580-0-1504

Undergraduate And Graduate Credit

229 699. English Seminar. (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. 229-699-0-1501

229 702. The Folk Tale. (3) II. Myths, legends, folktales of Europe and America. Half of course devoted to American Plains Indian oral literature, especially that dealing with cosmology and trickster tales. Pr.: Junior standing. 229-702-0-1502

229 707. Medieval Literature. (3) II. A survey of non-Chaucerian literature, with stress on the Arthurian romances. Pr.: Junior standing. 229-707-0-1502

229 708. Chaucer. (3) I, II, S. Pr.: Junior standing. 229-708-0-1502

229 711. Elizabethan Non-dramatic Literature. (3) I alt. years. An introduction to the literature of the English Renaissance. Pr.: Junior standing. 229-711-0-1502

229 712. Spenser. (3) I alt. years. Pr.: Junior standing. 229-712-0-1502

229 714. British Drama to 1642. (3) I, S in alt. years. A survey of the dramatic literature of Elizabethan and Jacobean times, exclusive of Shakespeare. Pr.: Junior standing. 229-714-0-1502

229 716. Shakespearean Drama I. (3) I, S in alt. 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. 229-716-0-1502

229 717. Shakespearean Drama II. (3) II, S in alt. 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. 229-717-0-1502

229 721. Seventeenth Century Literature. (3) II, S. A survey of the principal non-dramatic writers, apart from Milton. 1600-1660. Pr.: Junior standing. 229-721-0-1502

229 722. Milton. (3) II, S. Pr.: Junior standing. 229-722-0-1502

229 724. Restoration and Eighteenth Century Drama. (3) I, S in alt. years. A survey of English dramatic literature from 1660 to 1800. Pr.: Junior standing. 229-724-0-1502

229 726. 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. 229-726-0-1502

229 727. Eighteenth Century II. (3) II, S. The age of Dr. Johnson and the beginnings of Romanticism. Pr.: Junior standing. 229-727-0-1502

229 731. British Novel I. (3) I, S. A survey of British fiction from Defoe to the Brontes. Pr.: Junior standing. 229-731-0-1502

229 732. British Novel II. (3) II, S. A survey of British fiction from Dickens and Thackeray to Galsworthy and Bennett. Pr.: Junior standingr. 229-732-0-1502

229 736. The Romantic Movement. (3) I, S. The poetry and prose of Blake, Wordsworth, Coleridge, Byron, Shelley and Keats. Pr.: Junior standing. 229-736-0-1502

229 738. 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. 229-738-0-1502

229 739. The New England Transcendentalists. (3) II in alt. years, S. A study of the Transcendental Movement, with emphases on Emerson and Thoreau. Pr.: Junior standing, or Engl. 280. 229-739-0-1502

229 741. Nineteenth Century American Poetry. (3) II, S. Emphases on Poe, Whitman and Dickinson. Pr.: Junior standing. 229-741-0-1502

229 742. Nineteenth Century American Fiction I. (3) I, S. Emphases on Brown, Cooper, Poe, Hawthorne and Melville. Pr.: Junior standing, or Engl. 280. 229-742-0-1502

229 743. Nineteenth Century American Fiction II. (3) II, S. Emphases on Twain, James, Howells, Crane and Norris. Pr.: Junior standing. 229-743-0-1502

229 748. The Victorian Era. (3) II, S. The poetry of Arnold, Browning and Tennyson; the criticism of Arnold; additional related prose. Pr.: Junior standing. 229-748-0-1502

229 749. Nineteenth Century British Prose. (3) II. Significant prose writing of the period from Edmund Burke to Samuel Butler and Walter Pater, with an emphases on Thomas Carlyle. Pr.: Junior standing. 229-749-0-1502

229 751. American Humor and Satire. (3) II, S. Emphases on works produced in the nineteenth and twentieth centuries. Pr.: Junior standing. 229-751-0-1502

229 754. Twentieth Century British Novel. (3) II. British fiction from Conrad and Joyce to Greene and Waugh. Pr.: Junior standing. 229-754-0-1502

229 756. Twentieth Century American Novel. (3) I, S. The American novel from Dreiser to figures of the 1940s. Pr.: Junior standing, or Engl. 285. 229-756-0-1502

229 757. **Twentieth Century American Short Story.** (3) II, S. The development of the form since 1900. Pr.: Junior standing. 229-757-0-1502

229 758. American Novel, 1950-1970. (3) II in alt. years. A study of distinctive qualities of selected American novels since 1950. Pr.: Junior standing, or one course in American literature. 229-758-0-1501

229 761. Advanced Creative Writing: Prose Fiction. (3) I, II, S. Advanced writing of prose fiction. Repeatable once. Pr.: English 500, or proof of equivalent proficiency. 229-761-0-1507

229 762. Advanced Playwriting. (3). Same as Speech 762. 229-762-0-1507

229 763. Advanced Creative Writing: Poetry. (3). I, II, S. Advanced writing of poetry. Repeatable once. Pr.: English 500, or proof of equivalent proficiency. 229-763-0-1507

229 764. Twentieth Century British Drama. (3) I, S. British drama from Wilde and Shaw to Pinter and his contemporaries. Pr.: Junior standing. 229-764-0-1502

229 765. Twentieth Century American Drama. (3) II, S. American drama from O'Neill and Rice to Leroi Jones and his contemporaries. Pr.: Junior standing. 229-765-0-1502

229 766. Twentieth Century British Poetry. (3) I. Development of British poetry from Hardy and Yeats to the present. Pr.: Junior standing, or Engl. 265. 229-766-0-1502

229 767. Twentieth Century American Poetry. (3) II, S. Development of American poetry from Robinson and Frost to Eliot and the present. Pr.: Junior standing, or Engl. 285. 229-767-0-1502

229 790. 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. 229-790-0-1505

229 792. 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. 229-792-0-1501

229 794. 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. Advanced Composition (English 400) is recommended. 229-794-0-1501

229 795. 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. 229-795-0-1502

229 796. 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 Modern English Grammar (English 530) or Introduction to Linguistics. 229-796-0-1505

229 798. Literature Proseminar. (3) II. An intensive experience in reading and discussing selected literary texts in particular critical contexts; emphasizes how various critical approaches contribute to the exploration and transmission by literature of humane values. Pr.: Junior standing and 18 hrs. of English. 229-798-0-1502

229 799. Problems in English. (Var.) I, II, S. Studies in major authors, genres and periods of English and American literature and language. Pr.: Background of courses needed for problem undertaken. 229-799-3-1501

Graduate Credit

229 802. Graduate Studies in English. (1) I, II, S. A survey of the principles of research and scholarhip, the range of literary studies, basic bibliographies and other airds, 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.. 229-802-0-1502

229 810. Old English. (3) I, S. The elements of Old English grammar, with readings in prose and poetry. Pr.: Consent of instructor. 229-810-0-1505

229 811. Old English Poetry. (3) II, S. Pr.: Engl. 810 or consent of instructor. 229-811-0-1502

229 812. Middle English Poetry. (3) I. Pr.: Engl. 790 or consent of instructor. 229-812-0-1502

229 820. Selected Topics in the Study of Language. (3). Pr.: Engl. 790 or consent of instructor. 229-820-0-1505

229 830. Chaucer Seminar. (3). Pr.: Engl. 630. 229-830-0-1502

229 850. Shakespeare Seminar. (3). Pr.: Engl. 650 or 652. 229-850-0-1502

229 870. Milton Seminar. (3). Pr.: Engl. 670 or consent of instructor. 229-870-0-1502

229 890. Topics in Poetry. (3). Intensive study of a poet or group of poets, either British or American. Pr.: Consent of instructor. 229-890-0-1502

229 892. Topics in Drama. (3). Intensive study of a dramatist or group of dramatists, either British or American. Pr.: Consent of instructor. 229-892-0-1502

229 894. Topics in Fiction. (3). Intensive study of a novelist or group of novelists, either British or American. Pr.: Consent of instructor. 229-894-0-1502

229 898. Master's Report. (2) I, II, S. 229-898-4-1501

229 900. Bibliography and Methods of Research. (3) I, S. An introduction to textual, bibliographic and professional problems, required of Ph.D. candidates. 229-900-0-1502

229 940. Studies in Sixteenth Century Literature. (3). Pr.: Consent of instructor. 229-940-0-1502

229 950. Studies in Seventeenth Century Literature. (3). Pr.: Consent of instructor. 229-950-0-1502

229 960. Studies in Eighteenth Century Literature: British. (3). Pr.: Consent of instructor. 229-960-0-1502

229 965. Studies in Eighteenth Century Literature: American. (3). Pr.: Consent of instructor. 229-965-0-1502

229 970. Studies in Nineteenth Century Literature: British. (3). Pr.: Consent of instructor. 229-970-0-1502

229 975. Studies in Nineteenth Century Literature: American. (3). Pr.: Consent of instructor. 229-975-0-1502

229 980. Studies in Twentieth Century Literature: British. (3). Pr.: Consent of instructor. 229-980-0-1502

229 985. Studies in Twentieth Century Literature: American. (3). Pr.: Consent of instructor. 229-985-0-1502

229 999. Research in English. (Var.) I, II, S. Pr.: Sufficient training to carry on the research undertaken. 229-999-4-1501

Courses in Linguistics

Undergraduate And Graduate Credit

229 681. General Phonetics. (3). 229-681-1-1502

229 780. Introduction to Linguistics. (3) I, II, S. Same as Speech and Modern Languages 780. 229-780-0-1502

229 781. Introduction to Historical Linguistics. (3) II. Same as Speech and Modern Languages 781. 229-781-0-1502

229 782. Language Typology. (3). Same as Speech and Modern Languages 782. 229-782-0-1502

229 783. Phonology I. (3). Same as Speech and Modern Languages 783. 229-785-0-1502

229 784. Phonology II. (3). Same as Speech and Modern Languages 784. 229-784-0-1502

229 785. Syntax I. (3). Same as Speech and Modern Languages 785. 229-785-0-1502

229 786. Syntax II. (3). Same as Speech and Modern Languages 786. 229-786-0-1502

229 787. Advanced Syntax. (3). Same as Speech and Modern Languages 787. 229-787-0-1502

229 788. Advanced Phonology. (3). Same as Speech and Modern Languages 788. 229-788-0-1502

229 789. Topics in Linguistics. (3). Same as Speech and Modern Languages 789. 229-789-0-1502

229 791. Methods and Techniques of Learning a Second Language. (3). Same as Speech and Modern Languages 791. 229-791-0-1502

GEOGRAPHY

W. R. Siddall, Head of Department*

Professor Siddall;* Associate Professors Kromm,* Self,* and Stover;* Assistant Professors Bussing,* Seyler, and White.* Emeritus: Professor Stacey.

Geographers, in studying the differences in human activities from one place to another, deal with vital questions about current national and international situations. Why are the people of some areas wealthy and those of other regions poor, some well-fed and others starving, some industrialized and some agricultural, some free and others enslaved?

In their attempts to answer such questions geographers draw upon other disciplines, especially in the social sciences, in order to discern the various interrelated factors which combine to bring about particular conditions in specific areas. Geography is, therefore, a very broad inquiry into the state of the world today, advanced by bringing together the ideas and concepts of many disciplines 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. In this more rigorously scientific approach full use is made of various techniques of mathematical and cartographic analysis of spatial phenomena, computer mapping, and remote sensing, with the expectation of acquiring greater insight into many old problems with this spatially-oriented approach.

A typical and traditional problem in geography concerns man's impact on the land; over a century ago the geographer George Perkins Marsh published his now classic **Man and Nature.** Deterioration of environmental quality is best understood by the geographer's characteristically broad approach. 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 numerous factors such as technology, population density, legal structure, affluence and cultural traditions.

Professional opportunities for students trained in geography exist especially in government service, teaching, planning and business; and for the non-professionally oriented student it is a study characterized by a broad and liberalizing approach to worldwide political, social and economic conditions.

Undergraduate Study

Requirements for a major in geography under the curriculum leading to the Bachelor of Science degree (see page 101) are as follows: Geography 100 or 200; 220; two out of three of 420, 440, and 450; 470; 480; one course at the 600 level; one course at the 700 level; additional courses at the 490 level or above to make a total of 28 hours; and Elementary Statistics for the Social Sciences (285 330) or its equivalent.

The student also has the option of majoring in geography under a curriculum leading to a Bachelor of Arts degree. The geography requirements are the same, although the college requirements differ as described elsewhere (see page 101).

In either of these curricula 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 also 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.

A third 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.

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 a planning career. All candidates for the Master of Arts degree are required to take Geography 700 (except option B students), 800, 820, and 840.

Students may choose, in consultation with their advisers, one of three programs leading to the M.A. degree. **Option A** requires 30 hours of graduate credit including six hours of credit for a thesis. Of the 24 hours of credit required in course work, no fewer than 15 hours must be in geography. **Option B** is for students who intend to pursue or continue a career 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 Geography 898 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** is a non-thesis 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-six hours of graduate level work are required of which at least nine and no more than 12 hours must be outside the geography department.

The geography department is equipped with a small reference library, a good collection of research maps, a cartography laboratory, 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

235 100. 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. 235-100-0-2206

235 200. Man, Space, and the Environment. (3) I, II. 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. 235-200-0-2206

235 220. Environmental Geography I. (4) I, II. A comprehensive survey of the natural environment focusing on contemporary issues such as air pollution, water resource depletion, soil erosion, natural hazards, lack of open space and environmental quality. Three hours lec. and two hours lab. a week. 235-220-1-1917

235 310. 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. 235-310-0-2206

235 390. Experimental Studies in Geography. (1-6). Experimental and interdisciplinary studies in geography. Topics selected in consultation with instructor. Pr.: Permission of instructor. 235-390-0-2206

235 399. Honors Seminar in Geography. (2-3). Selected topics. Open to non-majors in the Honors Program. 235-399-0-2206

235 420. Environmental Geography II. (4) I, II. Interrelations existing between features of the natural environment and the manner in which their distribution affects settlement patterns, land use patterns, quality of life, and human adjustments to the environment. Three hours lec. and two hours lab. a week. Pr.: Geog. 220. 235-420-1-1917

235 440. 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 production and comsumption of natural resources. 235-440-0-2206

235 450. Geography of Economic Behavior. (3) II. The location of manufacturing industries and patterns of commercial activity. Case studies and simulations are utilized with emphasis on modern concepts of site selection and community development. 235-450-0-2206

235 460. Future Worlds. (3). 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. 235-460-0-2206

235 470. Cartography. (3) I. Theory, interpretation, and design and drafting of maps, with emphasis on presenting quantitative data. 235-470-1-2206

235 480. Pro-Seminar in Geography. (2) II. A survey of geography as a profession—its philosophy and its methodology. Graduation requirement for all undergraduate majors in geography. Pr.: Four courses in geography or consent of instructor. 235-480-0-2206

235 490. Problems in Geography. (Var.) I, II, S. Pr.: Consent of instructor. 235-490-4-2206

235 499. Senior Honors Thesis (2) I, II, S. Open only to seniors in the Arts and Sciences honor program. 235-499-4-2206

Undergraduate And Graduate Credit

235 600. Geography of the United States. (3) I. 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. 235-600-0-2206

235 620. Geography of Latin America. (3) I, odd years. 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. 235-620-0-2206

235 640. Geography of Europe. (3) II. People and their environment, their cultures, problems and prospects in Europe west of the Soviet sphere; trends of development as affected by changing political and economic factors. 235-640-0-2206

235 650. Geography of the Soviet Union. (3). Geographic regions of the U.S.S.R.; the agriculture, minerals, manufacturing and settlement in each, particularly as affected by climatic and locational factors. 235-650-0-2206

235 670. Geography of Australia and New Zealand. (2). Present conditions and prospects, with special attention to regional structure, economic development and roles of these countries in world trade. 235-670-0-2206

235 680. Seminar in Regional Geography. (1-3). Pr.: Consent of instructor. 235-680-0-2206

235 700. 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. 235-700-0-2206

235 705. Remote Sensing of the Environment. (2) II. Remote sensing and its application to earth study, especially environmental problems and land use. Course employs both readings and the use of imagery. One hour lecture, two hours laboratory. Pr.: One course in physical science and one in biological science. 235-705-1-2206

235 710. Geography of Hunger. (2) I, 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. 235-710-0-2206

235 715. World Population Patterns. (3) I, 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. 235-715-0-2206

235 720. Resources and Economic Development. (3) I, even years. The role of natural resources in global and regional development. Considers the limits to growth created by resources scarcity. Pr.: Six hours of social science.. 235-720-0-2206

235 730. Advanced Economic Geography. (3) II, odd years. Economic and place factors in the shifting locations of major production: agricultural, mineral, manufacturing and other world industries. Lecture and seminar. Pr.: Geog. 450 or equiv. 235-730-0-2206

235 740. Geography of Transportation. (3) II. 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. 235-740-0-2206

235 750. 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. 235-750-0-2206

235 760. Human Impact on the Environment. (3) II, 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. 235-760-0-2206

235 770. Perception of the Environment. (3) II, even 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 six hours of natural science with one course above the introductory level. 235-770-0-2206

235 780. Cultural Geography. (3). 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. 235-780-0-2206

235 790. Seminar in Cultural-Economic Geography. (1-3). Pr.: Consent of instructor. 235-790-0-2206

Graduate Credit

235 800. Graduate Colloquium. (2) I. The nature, aims, methods and evaluation of geographical research. Required of all graduate students majoring in geography. 235-800-0-2206

235 820. 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. 235-820-0-2206

235 840. Seminar in Current Geographical Research. (1) II. Department-wide seminar required of all graduate students. 235-840-0-2206

235 850. Topics in Environmental Geography. (1 to 3) I, II. Pr.: Consent of instructor. 235-850-3-2206

235 860. Topics in Economic Geography. (1 to 3) I, II. Pr.: Consent of instructor. 235-860-3-2206

235 870. Topics in Cultural Geography. (1 to 3) I, II. Pr.: Consent of instructor. 235-870-3-2206

235 898. 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. 235-898-4-2206

235 899. Thesis. (6) I, II. For students enrolled in Geography Option A. Pr.: Registration in Graduate School, with sufficient training to carry on the line of research undertaken. 235-899-4-2206

GEOLOGY

James R. Underwood, Jr., Head of Department*

Professors Beck,* Shenkel,* Twiss,* Underwood,* and Walters;* Associate Professors Chaudhuri, * Cullers,* and West;* Assistant Professors Riseman;* Emeritus: Professor Chelikowksy.*

Traditionally defined as the study of the earth's composition, behavior, and history, geology now includes the study of the members of the solar system. As a science, it is both practical and highly theoretical. "What type of foundation is necessary to support a 14-story building in Atlantic City? Where can Kansas City find unpolluted water for an increasing population? What are the world's reserves in oil and natural gas and where can more be found? Is the ocean floor spreading? Can Mars support life?" These are some of the questions geologists try to answer.

The earth and other members of the solar system are dynamic physical systems composed of atoms interacting under varied conditions of temperature and pressure. Consequently, geology relies heavily on other sciences—mathematics, physics, chemistry, biology and astronomy. In the solar system, the earth seemingly has been the only known habitat of life for at least the last billion years.

Geologists operate in two laboratories: the earth itself (field laboratory) and the standard chemical, physical or biologic laboratory. However, geologists cannot control the variables affecting the natural process 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.

Geology Option. In addition to the general requirements for the B.A. or B.S. degree, the following must be completed: Geol. 100, 130, 200, 502, 503, 507, 520, 530, 570, 580, 581, 703, 718; Math. 220 and 221; Phys. 113 and 114; Chem. 210 and 230; Biol. 198.

Geophysics Option. In addiion to the general requirements, the following must be completed: Geol. 100, 130, 200, 502, 503, 530, 570, 703, and 718; Math. 220, 221, 222, 240, 551; Phys. 213, 214, 551; Chem. 210 and 230; Biol. 198.

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, 130, 502, 512, 520; Geog. 220; Math. 100 and 150; Chem. 210 and 230; Biol. 198; Phys. 113, 114, 191, and 193.

Dual Degrees 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. 200, 502, 503, 520, 530, 703, and 718.

Transfer Students

In addition to the general instructions to transfer students those students planning to pursue one of the degree options in geology should complete as many of the following courses or their equivalents as possible: Chem. 210 and 230; Engl. 100 and 120; Math. 100, 150, 220, and 221; Spch. 105; Geol. 100, 130, and 200; Phys. 113 and 114; Biol. 198.

Graduate Study

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, mathematics, and the biological sciences. The Graduate Record Examination (verbal, quantitative, and advanced geology sections) is required for entrance. Additional requirements of the Graduate School are listed in the appropriate section of this catalog.

Graduate degrees are essential for careers as professional geologists in business, government, or higher education. The minimum requirement for the M.S. in geology is 30 semester hours which includes at least two courses in supporting areas other than geology and six hours of research leading to successful completion of a thesis.

Research facilities include a six-inch, 60-degree solid source mass spectrometer, hydrothermal equipment, emission spectrograph, x-ray diffractometer and spectrograph, atomic absorption/flame emission spectrophotometer, cathode luminescence microscope, a fully equipped geochemistry laboratory for isotopic work, instrumentation for chemical analysis of natural waters, complete petrographic, paleobiological and general geology laboratories. Geophysical facilities include resistivity, seismic and magnetic exploration equipment.

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, plains- type structures, invertebrate paleobiology and paleoecology.

Courses in Geology

Undergraduate Credit

234 100. 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. 234-100-0-1914

234 101. Natural Science Colloquium. (2) I, II. Offered by telenet. Topics in natural 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. 234-101-0-1914

234 105. Oceanography. (3) I, II, S. The oceans: their boundaries, contents and processes. Three hours rec. a week. 234-105-0-1919

234 120. Environmental Geology. (2) I, II S. Influence of earth processes on human activity and the geological consequences of the use of the environment. Two hours rec. a week. 234-120-0-1914

234 130. 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 120 or conc. enrollment. 234-130-1-1914

234 200. Historical Geology. (4) I, II, S. Physical and biologic events that have occurred on planet earth throughout geologic time. Three hours rec. and three hours lab. a week. Pr.: Geol. 100 or 105. 234-200-1-1914

234 210. Geology of Planets. (3) I. Application of geochemical and geophysical principles to the evolution of planetary structures. Alternative interpretations of current observations of planet features will be discussed. Three hours rec. a week. Pr.: One of the following: Geol. 100, 105, 120; Geog. 220; Phys. 102, 191. 234-210-0-1914

234 310. Topics in Geology. (2) I, II. Seminar discussion of subjects of current interest in geology. Pr.: Geol. 100 or equivalent natural science course. 234-310-0-1914

234 399. Honors Seminar in Geology. (1-3) I 1978. Selected topics. Open to non-majors in the Honors Program. 234-399-0-1914

234 499. Senior Honors Thesis (2) I, II, S. Open only to seniors in the Arts and Sciences honors program. 234-499-4-1914

Undergraduate And Graduate Credit In Minor Field

234 501. Independent Study in Geology. (1-3) I, II, S. Independent reading, field and/or laboratory investigations of geologic problems. Pr.: Geol. 200 and junior standing. 234-501-0-1914

234 502. Mineralogy and Petrology I. (4) I. Fundamentals of crystallography and crystal chemistry; physical properties of crystals; descriptive mineralogy and petrology of nonsilicates. Three hours lec. and three hours lab. a week. Pr.: Geol. 100 or 105 and 130 and Chem. 230. 234-502-1-5-1914

234 503. Mineralogy and Petrology II. (4) II. Descriptive mineralogy and petrology of the silicates; fundamental geochemistry; microscopic identification of minerals and rocks. Three hours lec. and three hours lab. a week. Pr.: Geol. 502. 234-503-1-5-1914

234 504. Oil and Gas Exploration and Evaluation Methods. (3) I, II. Geology of oil and gas accumulation, drilling and testing methods, exploration costs and risks, procedures for securing drilling rights, and appraisal of proved and unproved areas. For non-geology majors only. Pr.: Junior standing or equivalent experience. 234-504-0-1914

234 507. Introductory Geochemistry. (3) I. Chemical principles involved in the understanding of geologic processes. Two hours rec. and three hours lab. a week. Pr.: Geol. 503. 234-507-1-4-1915

234 512. Earth Science. (3) I, II, S. 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. 234-512-1-1917

234 515. Geology of the National Parks. (3) I, II, S. 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. 234-515-0-1914

234 520. Geomorphology. (4) I, II, S. Various landforms and their evolution; geologic interpretation of landscapes, especially of features in the United States; interpretation of topographic maps. Three hours rec. and three hours lab. a week. Pr.: Geol. 100. 234-520-1-1914

234 530. Structural Geology. (4) II. Mechanics of the earth's crust; interrelation of structures in the earth. Three hours rec. and three hours lab. a week. Pr.: Geol. 570. 234-530-1-5-1914

234 570. Field Methods in Geology. (2) I, II. Construction of geologic maps; application of field methods to the problems of geology. One hour rec. and three hours lab. a week. Pr.: Geol. 200. 234-570-1-1914

234 580. Paleobiology I. (3) I. Concepts and problems of paleobiology; systematic approach to lower invertebrate phyla and marine calcareous algae with emphasis on fossil forms. Two hours rec. and three hours lab. a week. Pr.: Geol. 200 or Biol. 198 or 201 or consent of instructor. 234-580-1-1918

234 581. Paleobiology II. (3) II. Continuation of Paleobiology I dealing with higher invertebrate phyla with fossil records. Two hours rec. and three hours lab. a week. Pr.: Geol. 580. 234-581-1-1918

Undergraduate And Graduate Credit

234 640. Petroleum Geology. (3) II. Origin, migration and accumulation of petroleum; stratigraphy and structure of important fields. Three hours rec. a week. Pr.: Geol. 200. 234-640-0-1914

234 702. Economic Geology. (3) I, II. Origin and mode of occurrence of nonmetallic minerals, including coal and petroleum, and of metallic mineral deposits. Two hours rec. and three hours lab. a week. Pr.: Geol. 200, 503. 234-702-1-1914

234 703. Stratigraphic Geology. (4) I, II. Description, classification, and correlation of stratigraphic units, with emphasis on those of Kansas. Three hours rec. and three hours lab. a week. Pr.: Geol. 580. 234-703-1-1914

234 704. Paleoecology. (3) I, II. 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. 580 or consent of instructor. 234-704-1-1918

234 708. Optical Mineralogy-Petrology. (4) I. Identification of minerals and rocks as crushed fragments and in thin sections; petrology of igneous, metamorphic and sedimentary rocks. Two hours lec. and six hours lab. a week. Pr.: Geol. 503. 234-708-1-3-1914

234 710. Applied Geology. (3) I, II. Geology applied to the science of engineering in urban and regional planning. Two hours rec. and three hours lab. a week. Pr.: Consent of instructor. 234-710-1-1914

234 711. Water Resources Geochemistry. (2) I, II. Geochemistry of ground and surface waters; emphasis on mineralogic and hydrologic controls on inorganic constituents and properties. Two hours rec. a week and one field trip a semester. Pr.: Geol. 507 or Agron. 705 or 755 or consent of instructor. 234-711-0-1915

234 712. Advanced Geochemistry. (4) II. Application of chemical principles to igneous, metamorphic systems; emphasis on equilibria, oxidation-reduction, crystal chemistry and thermodynamics. Three hours lec. and three hours lab. a week. Pr.: Geol. 507 and Chem. 585. 234-712-1-5-1915

234 716. 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 703, or consent of instructor. 234-716-0-1914

234 718. Field Geology. (Var.) S. Opportunity is offered students to do field work in the Rocky Mountains. Students interested should consult the head of the department. 234-718-2-1914

234 720. Quaternary Geology. (2) I, II. Quaternary stratigraphy and its development in North America; correlation of European and North American Quaternary rocks and sediments. Two hours rec. a week and one field trip a semester. Pr.: Geol. 703. 234-720-0-1914

234 740. Regional Geology. (3) I, II. Structure and stratigraphy of the major tectonic units of North America. Pr.: Geol. 530, 703. 234-740-0-1914

234 770. Subsurface Methods. (3) I, II. Well cuttings, electric logs, and radioactive logs as applied to subsurface mapping of rocks and their fluid content. One hour rec. and six hours lab. a week. Pr.: Geol. 703. 234-770-1-1914

234 790. Problems in Geology. (Var.) I, II, S. Work is offered in mineralogy, paleobiology, paleoecology, stratigraphy, structural geology, sedimentary petrology, and geochemistry. Pr.: Background of courses needed for problem undertaken. 234-790-3-1914

Graduate Credit

234 800. Graduate Seminar in Geology. (Var.) I, II. Topics in geology, geochemistry and geophysics. 234-800-3-1914

234 801. Advanced Paleobiology. (1-4) I, II. Detailed study of the functional morphology, ecology, biogeography, evolution and classification of selected groups. Pr.: Geol. 580 or consent of instructor. 234-801-0-1918

234 802. Advanced Hydrogeology. (3) II, alt. years. Computer applications to ground-water flow; system analysis of surface and subsurface water in the ecosystem. Three hours rec. a week. Pr.: Geol. 716 or consent of instructor for non-majors. 234-802-0-1914

234 804. Igneous and Metamorphic Petrology. (4) II. Selected problems in the petrogenesis of igneous and metamorphic rocks. Three hours lec. and three hours lab. a week. Pr.: Geol. 708. 234-804-1-5-1914

234 806. 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. 708. 234-806-1-5-1914

234 807. Advanced Sedimentary Petrology. (2) I, II, S. Field and laboratory study of selected problems in the origin of sedimentary rocks. Pr.: Geol. 806. 234-807-1-5-1914

234 810. 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. 708 or consent of instructor. 234-810-0-1914

234 830. Geotectonics. (3) I. Origin and history of major structural elements of the earth, especially their interaction through time. Pr.: Geol. 530. 234-830-0-1914

234 840. Planetology. (3) II. Geologic principles applied to a study of the solar system. Pr.: Geol. 530, 712 or consent of instructor. 234-840-0-1914

234 880. 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.: Consent of instructor. 234-880-1-1914

234 899. Research in Geology, M.S. (Var.) I, II, S. Work is offered in mineralogy, paleobiology, paleoecology, stratigraphy, structural geology, igneous, metamorphic and sedimentary petrology, geochemistry and isotope geology. Pr.: Registration in Graduate School, with sufficient training to undertake research in specific area. 234-899-4-1914

HEALTH, PHYSICAL EDUCATION, AND RECREATION,

Don Kirkendall, Head of Department

Professors Corbin,* Kirkendall;* Associate Professors Johnson,* Lindley,* Noble,* and Wauthier;* Assistant Professors Cox,* Gench,* Laurie,* Mahler, McSwegin, Ross, Snyder,* Stewart, Warden, and Zuti;* Instructors Blair, Poole; Emeritus: Professors Evans and Geyer, Associate Professor McKinney.

Students enrolling in the Department of Health, Physical Education, and Recreation may earn a degree in health, physical education or recreation. A major in health will prepare a student for a career in teaching or in other health occupations. Majors in physical education may select specialization areas such as elementary physical education, secondary physical education, athletic coaching, dance, exercise science, or non-teaching. The non-teaching degree is a more general degree which does not prepare the student for teacher certification. The recreation major is prepared for careers in community and other recreation agencies.

Transfer Students

Students transferring to Kansas State University and desiring to complete a major in the HPER department should send an up-to-date transcript to the coordinator of professional preparation, Department of HPER, Kansas State University. It will be evaluated prior to entrance to the University. If possible, transfer students should adhere to the following:

a) Complete a three-hour speech class prior to transfer. If your transfer school offers a two-hour speech class, take it and also take a literature course or four-hour language course.

b) Check the general requirements of Kansas State University and the college you intend to enroll in upon arrival. Try to complete as many of these requirements as possible before arrival. This is especially true of those transfer students who are completing two years of community college work prior to transfer.

c) Avoid taking major courses until transferring to Kansas State University if enrolled at a community college. Courses which will transfer from the junior college are Intro. to Physical Education and Personal and Community Health. If there are other courses you desire to take at the institution from which you are transferring, check with the K-State HPER department for clearance prior to taking the courses.

Undergraduate Study

Basic Physical Education Requirement

David Laurie, Coordinator

Freshmen enroll in one semester of the course 261-101, Concepts in Physical Education to satisfy the physical education requirement. After completion of Concepts in Physical Education students are encouraged to enroll in a one-credit-hour course (261-102 through 261-170), where an opportunity will be given for gaining knowledge, skill and appreciation of lifetime recreational activities.

Undergraduate Majors in Dance, Health, Physical Education and Recreation

Barbara Gench, Coordinator

Dance Major. For a major in dance students should take the following:

I. General education requirements—see Bachelor of Arts or Bachelor of Science degree, page 101.

II. Dance core

261 500	Methods and Materials of Dance	3
261 501	Dance Composition	3
261 502	Dance Workshop (Variable 1-2 hours)	4
241 744	History of dance	3
257 100	Fundamentals of Music	3
284 261	Fundamentals of Acting	3
261 117	Social, Square and Folk Dance	1
261 171	Jazz Dance	1
261 290	Kinesiology	3
261 373	First Aid—Multimedia	1
261 206	Professional Orientation	1
	Select ONE of the following:	
284 266	Fundamentals of Tech. Production I	3
284 267	Fundamentals of Tech. Production II	3
	Select ONE of the following:	
261 355	Movement Exploration	3
284 260	Stage Movement	3
	Select ONE of the following:	
209 195	Survey of Art History I	3
209 196	Survey of Art History II	3
209 100	Design I	2

III. Dance specialization (students select A or B)

A. Modern Dance

261 120	Modern Dance I	1
261 121	Modern Dance II	1
261 323	Tech. of Intermediate Modern Dance (complete a total of 4 hours)	2
261 324	Tech. of Advanced Modern Dance (complete a total of 4 hours)	2
	One semester of study in ballet	1

B. Ballet

261 165	Ballet I	1
261 166	Ballet II	1
261 325	Tech. of Intermediate Ballet (complete a total of 4 hours)	2
261 326	Tech. of Advanced Ballet (complete a total of 4 hours)	2
	One semester of study in modern dance	1

Health Major. For a degree in health the student should take the following:

I. General education requirements—see Bachelor of Science degree, page 101.

II. Professional education requirements

(For those seeking teacher certification)

Educational Psychology I and II, 6 hours
Health Education Professional Semester
Teaching Participation—8 hours
Principles of Education (415 451 or 415 300), 3 hours
Educational Sociology, 3 hours
Methods (Health) (415 476), 3 hours

III. Health major core (to be taken by all majors)

Core:*

261 201	Personal and Community Health	3
261 206	Professional Orientation	1
261 555	Community Health	3
261 780	Seminar in Health Education	3
	or	
261 583	Current Health Issues	3
261 375	First Aid—Multimedia	1
261 377	First Aid—Multimedia Instructor	1
261 765	Human Sexuality (or 620 765)	3
261 747	Drugs and the Student	3

* Students in allied health specialization substitute 261 740 Administration of Health Care Programs (3) and 261 550 Health Appraisal (3) for 261 765 and 261 747.

IV. Health specialization areas

To earn a major in health, a student must complete one of the following in addition to the health major core:

A. Elementary Health Education Specialization:[1]

261 381	Health for Elementary Teachers	3
261 378	First Aid (Basic Instructors)	1
261 515	Health Appraisal	3
415 779	Primary School Education	3
	Two courses to be selected from the following	
415 780	Kindergarten Education	3
215 303	Ecosystems and Society	3
273 280	Psych. of Childhood & Adolescence	3
273 622	Psych. of Exceptional Children	3
273 505	Abnormal Psychology	3
261 462	Practicum in Health	2
261 385	Consumer Health & Quackery	3
	Six hours of health-related electives to be selected from the following	
215 310	Biology & the Future of Man	3
273 420	Personality Development	3
640 132	Basic Nutrition	3
620 332	Concepts in Family Health	3
261 780	Seminar in Health Education	3
261 583	Current Health Issues	3
261 365	Health, Illness & Death	3

B. Secondary Health Education Specialization:[1]

261 462	Practicum in Health	2
261 378	First Aid—Basic Instructors	1
640 132	Basic Nutrition	3
261 550	Health Appraisal & Counseling	3
	Two courses selected from the following:	
620 230	Intro. to Human Development	3
273 280	Psych. of Childhood & Adolescence	3
415 325	Safety	3
620 332	Concepts in Family Health	3
261 780	Seminar in Health Education	3
261 583	Current Health Issues	3
261 550	Health Appraisal	3
261 385	Consumer Health & Quackery	3
	Six hours of health-related electives to be selected from the following	
273 420	Personality Development	3
277 411	Social Problems	3
273 550	Group Dynamics	3
620 650	The Family	3
630 110	Consumer Action	3
215 303	Ecosystems and Society	3
261 365	Health, Illness & Death	3

C. Community Health Specialization: [1 2]

415 316	Media	1
277 411	Social Problems	3
289 630	Public Relations	3
273 435	Social Psychology	3
261 585	Field Experience in Health	3
221 190	Elementary Organic Chemistry	3
221 191	Elementary Organic Chemistry Lab	2
	or	
221 230	Chemistry II	4
	Three courses selected from the following	
410 680	Introduction to Adult Education	3
405 215	Educational Psychology I	3
277 641	Social Gerontology	3
269 704	Interest Groups & Political Opinion	3
215 303	Ecosystems and Society	3
261 550	Health Appraisal	3
215 555	Microbiology	4
261 385	Consumer Health & Quackery	3
	Six hours of health-related electives to be selected from the following	
289 635	Public Information Methods	3
277 531	Urban Sociology	3
620 332	Concepts in Family Health	3
640 132	Basic Nutrition	3
277 450	Group Processes & Social Behavior	3
277 631	Community Organization & Leadership	3
215 520	Microbiology of Foods	3
261 365	Health, Illness & Death	3

D. Health Care Administration Specialization:[1 3]

550 609	Occupational Safety and Health	3
261 585	Field Experience & Internship	6
277 641	Social Gerontology	3
269 507	Intro. to Public Administration	3
	Two courses from the following	
640 132	Basic Nutrition	3
620 230	Intro. to Human Development	3
289 630	Public Relations	3
410 680	Intro. to Adult Education	3
225 110	Economics I	3
	Four courses from the following	
305 260	Fundamentals of Accounting	4
305 292	Business Law I	3
305 391	Administrative Communications	3
305 270	Managerial and Cost Controls	3
305 420	Management Concepts	3
305 520	Organizational Behavior	3
305 530	Labor Legislation	3
305 531	Personnel and Wage Administration	3

Physical Education Major. For a degree in physical education students should take the following:

I. General education requirements—see Bachelor of Science degree, page 101.

II. Professional education requirements

A. For Those Seeking Teacher Certification[1]

1. Educational Psychology I and II, 6 hours
2. Physical Education Professional Semester
   Teaching Participation—8 hours
   (must be done in area of specialization.)
   Principles of Education (415 451 or 415 300)—3 hours
   Educational Sociology—3 hours
   Methods (415 476 or 415 469)—3 hours

B. For Those Seeking Non-Teaching Degrees

Courses to be selected from no more than two University academic departments. A minimum of one course 300 level or above must be taken in each department from which courses are selected. If all courses are taken from one department, at least two courses must be numbered 300 or above—17 hours

III. Professional physical education core (to be taken by all majors)

Concepts in Physical Education	**1**
Lifetime Sport	**1**

Core Courses (to be taken by all majors):

261 201	P & C Health	3
261 206	Prof. Orientation	1
261 230	Social Dimensions	3
261 290	Kinesiology	3
261 375	First Aid—Multimedia	1
261 458	Philosophy, History & Principles of PE	3
261 561	Adapted Physical Education	3
261 565	Exercise Physiology	4
261 570	Motor Behavior	3
261 710	Tests and Measurements	3

IV. Physical education specialization area

To earn a major in physical education a student must complete one of the following in addition to the professional physical education core:

A. Elementary Physical Education Specialization

261 280	Phys. Ed. Materials for the Elem. Schools	3
261 252	Rhythms for Elem. Schools	3
261 355	Movement Exploration	3
261 241	Gymnastics and Lead-up Games for Elem. Schools	3

B. Secondary Physical Education Specialization

261 331	Individual Activities for Sec. Schools	3
261 266	Team Sports for Sec. Schools	3
261 251	Rhythms for Sec. Schools	3
261 242	Gymnastics and Recreational Games for Sec. Schools	3
261 460	Practice Teaching	3

Secondary physical education specialization: Must take four lifetime sports in addition to the lifetime sport requirement in the physical education core. Courses must be reported for CR/NCR, but may be taken for one credit. Courses from approved list.

C. Non-Teaching Physical Education Specialization

1. Dance Specialization:

284 261	Fundamentals of Acting	3
284 565	Fundamentals of Directing	3
284 165	Appreciation of Theatre	2
284 370	Dramatic Structure	3
284 260	Stage Movement	3
284 560	Advanced Stage Movement	3
261 021	(121) Beginning Modern Dance	0-1
261 060	(160) Beginning Ballet	0-1
261 323	Tech. of Inter. Modern Dance	2*
261 324	Tech. of Adv. Modern Dance	2*
	or	
261 325	Tech. of Inter. Ballet	2*
261 326	Tech. of Adv. Ballet	2*
261 500	Methods & Materials of Dance	3
261 501	Dance Composition	3
241 744	History of the Dance	3

* Each must be taken twice.

2. Exercise Science Specialization:

261 307	Techniques of Training & Conditioning	2
261 759	Organ., Imple., & Admin. of Exercise Prog	4
261 792	Internship in Recreation	8
261 535	Nutrition and Physical Activity	2

3. General Non-Teaching Specialization:

Any 15 hours of physical education courses numbered 300 or higher.

Recreation Major. For a degree in recreation students should take the following:

I. General education requirements—see Bachelor of Science degree, page 101.

II. Directed field experience (internship semester)

261 492	Internship in Recreation	15

[1] **The following Natural Science courses should be taken for any health or physical education teacher certification:**

215 198	Principles of Biology	4
215 240	Structure & Function of the Human Body	6
	Physical Science elective	—
215 310	Biology and the Future of Man	3

[2] **Natural Sciences-For Community Health Specialzation:**

The following natural science courses should be taken:

215 198	Principles of Biology	4
215 240	Structure & Function of the Human Body	6
215 220	Bacteriology and Man	3
221 210	Chemistry I	4

[3] **Natural Sciences-For Health Care Administration Specialization:**

The following courses should be taken:

215 198	Principles of Biology	4
285 350	Business & Economic Statistics	3
215 240	Structure & Function of the Human Body	6
	One other course	3

Student must meet the following qualifications:

A. Overall 2.2 GPA in all course work attempted at KSU, 2.5 GPA in recreation major courses or in exercise science specialization.

B. Recommended by major adviser.

C. Recreation majors must have satisfactory pre-internship experience in leisure/recreation field, minimum of 280 hours during college/university preparation. Students in non-teaching specializations must have met all specialization requirements.

D. Physical examination required.

III. Recreation core

261 206	Professional Orientation	1
26 261 390	Prin. & Phil. of Recreation	3
261 373	First Aid—(Multimedia)	1
261 480	Orientation in Recreation	2
261 481	Participation in Recreation	2
261 488	Recreation for Special Populations	3
261 489	Recreation Program	3
261 490	Recreation Admin. I	3
261 491	Recreation Seminar	2

IV. Recreation specialization (select and complete A or B)

A. Recreation program administration (18 hours)

This option is designed for the person who will be conducting and operating a recreation program in a variety of recreation settings. Courses will be selected from the recreation on major approved course list*, with at least one two-hour course taken from each of the three categories.

B. Special populations (18 hours)

1. Three courses from the following:

273-505	Abnormal Psychology
273-622	Psychology of Exceptional Children
110-757	Design for Special Populations
277-660	Juvenile Delinquency
277-661	Criminology
405-628	Characteristics of the Emotionally Disturbed
620-272	The Helping Relationship

2. Nine hours from Group I and II as listed on the recreation major approved course list.*

Coaching Program. This program is designed to prepare coaches in all areas of varsity athletics, and is open to non-majors as well as students majoring in health, physical education or recreation. Students completing the following courses will receive an athletic coaching endorsement from the Department of Health, Physical Education, and Recreation. Majors taking this program must also complete all requirements for a major in either health, physical education or recreation. The coaching program is not a substitute for specialization requirements. Non-majors are not required to take any work in the department in addition to the coaching program.

Coaching Program Requirements

261 315	Treatment of Athletic Injuries	3
261 359	Org. and Adm. of Athletics	3
Select		
261 202	Physiological Foundations of Coaching	2
or		
261 565	Physiology of Exercise	4
Select		
261-203	Kinesiological Foundation of Coaching	2
or		
261 290	Kinesiology	3
Select		
261 204	Psychological Aspects of Coaching	2
or		
261 570	Motor Behavior and Skill Learning	3

Four hours selected from the following:

261 298	Coaching and Officiating Wrestling	2
261 299	Coaching and Officiating Swimming	2
261 300	Coaching and Officiating Volleyball	2

261 301	Coaching and Judging Gymnastics	2
261 302	Coaching and Officiating Basketball	2
261 303	Coaching and Umpiring Baseball Baseball	2
261 304	Coaching and Officiating Track & Field	2
261 305	Coaching and Officiating Football	2
261 309	Coaching and Officiating Tennis and Golf	2

Graduate Study

Charles Corbin, Coordinator

Graduate study leading to the degree Master of Science in Health, Physical Education and Recreation.

Prerequisite to the work in the graduate program is an undergraduate major in health, physical education or equivalent. Specific deficiencies may be made up prior to final acceptance for the graduate program.

Students may choose from the following degree options: (1) 30 hours including a six- to eight-hour thesis and an oral comprehensive examination; (2) 30 hours including a two-hour master's report and an oral comprehensive examination; or (3) 33 hours including an oral comprehensive examination. A minimum of 18 semester hours must be earned in the Department of Health, Physical Education and Recreation.

Courses in Physical Education

Undergraduate Credit

The following undergraduate courses in physical education may be taken for elective credit.

261 101. Concepts in Physical Education. (1). 261-101-1-5-0835

261 102M. Concepts in Physical Education (Majors). (1). 261-102-1-5-0835

261 103H. Concepts in Physical Education (Honors). (1). 261-103-1-5-0835

261 104. Adaptive Physical Education. (1). 261-104-5-0835

261 105. Beginning Swimming. (1). 261-105-5-0835

261 106. Intermediate Swimming. (1). 261-106-5-0835

261 107. Advanced Swimming. (1). 261-107-5-0835

261 108. Diving. (1). 261-108-5-0835

261 109. Synchronized Swimming. (1). 261-109-5-0835

261 110. Beginning Scuba Diving. (1). 261-110-5-0835

261 111. Advanced Scuba Diving. (1). 261-111-5-0835

261 112. Advanced Life Saving. (1). 261-112-5-0835

261 113. Wrestling. (1). 261-113-5-0835

261 114. Weight Training. (1). 261-114-5-0835

261 115. Crew. (1). 261-115-5-0835

261 116. Calisthenics and Fitness Conditioning. (1). 261-116-5-0835

261 117. Social, Square and Folk Dance. (1). 261-117-5-0835

261 118. Social Dance. (1). 261-118-5-0835

261 119. Square Dance. (1). 261-119-5-0835

261 120. Modern Dance I. (1) 216-120-5-0835

261 121. Modern Dance II. (1). Pr.: HPER 120. 261-121-5-0835

261 122. Water Polo. (1). 261-122-5-0835

261 124. Tumbling and Trampoline. (1). 261-124-5-0835

261 125. Beginning Gymnastics and Apparatus. (1). 261-125-5-0835

261 126. Advanced Gymnastics and Apparatus. (1). 261-126-5-0835

261 127. Beginning Bowling. (1). 261-127-5-0835

261 128. Advanced Bowling. (1). 261-128-5-0835

261 129. Beginning Golf. (1). 261-129-5-0835

261 130. Advanced Golf. (1). 261-130-5-0835

261 131. Fencing. (1). 261-131-5-0835

261 132. Billiards and Snooker. (1). 261-132-5-0835

261 133. Table Tennis. (1). 261-133-5-0835

261 134. Horse Shoes. (1). 261-134-5-0835

261 135. Beginning Tennis. (1). 261-135-5-0835

261 136. Advanced Tennis. (1). 261-136-5-0835

261 137. Badminton. (1). 261-137-5-0835

261 138. Advanced Badminton. (1). 261-138-5-0835

261 139. Archery. (1). 261-139-5-0835

261 140. Field Archery. (1). 261-140-5-0835

261 141. Beginning Riflery. (1). 261-141-5-0835

261 142. Advanced Riflery. (1). 261-142-5-0835

261 143. Roller Skating. (1). 261-143-5-0835

261 144. Handball. (1). 261-144-5-0835

261 145. Paddleball-Racquetball. (1). 261-145-5-0835

261 147. Soccer. (1). 261-147-5-0835

261 148. Power Volleyball. (1). 261-148-5-0835

261 149. Cycling. (Bicycle). (1). 261-149-5-0835

261 150. Jogging. (1). 261-150-5-0835

261 151. Water Skiing. (1). 261-151-5-0835

261 152. Camping. (1). 261-152-5-0835

261 153. Hiking. (1). 261-153-5-0835

261 154. Bait and Fly Casting. (1). 261-154-5-0835

261 155. Angling. (Fishing). (1). 261-155-5-0835

261 156. Canoeing. (1). 261-156-5-0835

261 157. Field Hockey. (1). 261-157-5-0835

261 160. Trap Shooting. (1) I, II. 261-160-5-0835

261 161. Skiing. (1). 261-161-5-0835

261 162. Orienteering. (1). 261-162-5-0835

261 163. Sailing. (1). 261-163-5-0835

261 164. Self Defense. (1). 261-164-5-0835

261 165. Ballet I. (1). 261-165-5-0835

261 166. Ballet II. (1). Pr.: HPER 165. 261-166-5-0835

261 167. Beginning Western Horsemanship (1). 261-167-5-0835

261 168. Advanced Western Horsemanship. (1). 261-168-5-0835

261 169. Beginning English Horsemanship. (1). 261-169-5-0835

261 170. Advanced English Horsemanship. (1). 261-170-5-0835

261 171. Jazz Dance. (1). I, II. A basic course in jazz technique and style, focusing on isolations, rhythmic articulation, and the control and release of energy. 2 hours lab. a week. 261-171-5-0835

261 172. Beginning Judo. (1) I, II. 261-172-5-0835

261 173. Advanced Judo. (1) I, II. 261-173-5-0835

The following courses may be taken by students majoring in physical education or other students meeting prerequisite requirements.

261 200. Concepts of Adult Physical Fitness. (2). A study of the facts about the effects of regular exercise on physical fitness and health. 261-200-0-0835

261 202. Physiological Foundations of Coaching. (2) I. The human organism under both resting and exercise conditions, including the effect of training and conditioning, heat balance, nutrition, drugs and exercise metabolism on athletic performance. Special attention to applications for coaches. Not for P.E. majors. 261-202-0-0835

261 203. Kinesiological Foundations of Coaching. (2) I. The structure and function of the musculoskeletal system and the mechanical principles underlying sports performance with special attention to applications for coaches. The ability to analyze sports performance to determine the muscles involved, joint movements, and mechanical details with the unaided eye and with the use of film and video tape analysis will be developed. Not for P.E. majors. 261-203-0-0835

261 204. Psychological Foundations of Coaching. (2) II. Principles of learning and performing sports skills with special attention to applications for coaches. Specific areas of study include motivation, methods of teaching, and general factors affecting the learning and performing of sports skills. Pr.: 273-110. Not for P.E. majors.261-204-0-0835

261 206. Professional Orientation. (1). I, II, S. Orientation to the fields of health, physical education and recreation; the university; and the department. 261-206-0-0835

261 210. Drill Team Fundamentals. (2). The organization, instruction and routines suitable for junior and senior high school drill teams. 261-210-0-0835

261 215. Techniques of Officiating Team Sports. (2). Principles and practices of officiating team sports. 261-215-1-3-0835

261 216. Techniques of Officiating Individual Sports. (2). Principles and practices of officiating individual sports. 261-216-3-0835

261 230. Social Dimensions of Physical Activity. (3). I, II. An in-depth review of pertinent research dealing with the social significance of physical activity and the implications of that research to physical education and athletic programs. Pr.: Sociology 211. 261-230-0-0835

261 241. Gymnastics and Lead-Up Games for Elementary Schools. (3). A selection of activities and techniques of teaching beginning tumbling and apparatus work and games suitable for acquiring skills and basic concepts used in sports activities for grades K-6. One hour rec., four hours lab. 261-241-3-0835

261 242. Gymnastics for the Secondary Schools. (3). Theory and practice of tumbling and gymnastics. One hour lec. and four labs a week. Required for secondary program. 261-242-3-0835

261 251. Rhythms for Secondary Schools. (3). Fundamental rhythms, techniques and materials for teaching folk, square, modern and social dance in secondary schools. One hour rec. and four hours lab. a week. Required for secondary program. 261-251-3-0835

261 252. Rhythms for Elementary Schools. (3). An introduction to and techniques of basic dance moves, including creative, folk, country and square for grades K-6. One hour rec. and four hours lab. a week. 261-252-3-0835

261 266. Team Sports for Secondary Schools. (3). Theory and practice of selected activities from the following list: basketball, soccer, speedball, speedaway, field hockey, flag football and softball. One hour rec. and four hours lab. a week. Required for secondary program. 261-266-3-0835

261 280. Physical Education Materials for Elementary Schools. (3). Selection and presentation of physical education activities suitable for use with elementary school age children, with emphasis on fundamental movements and skills, games of low organization, classroom games, self-testing activities, body mechanics and warm-up activities, physical fitness, stunts and tumbling. One hour rec., four hours lab. Required for elementary program. 261-280-3-0835

261 290. Kinesiology. (3). Basic mechanics of human motion, action of joints and muscles, major types of motor skills and application to physical education activities. Laboratory exercises supplement this. Two hours rec., two hours lab. Pr.: Biol. 240. 261-290-7-0835

261 298. Coaching and Officiating Wrestling. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-298-5-0835

261 299. Coaching and Officiating Swimming. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-299-1-5-0835

261 300. Coaching and Officiating Volleyball. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-300-5-0835

261 301. Coaching and Judging Gymnastics. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-301-1-0835

261 302. Coaching and Officiating Basketball. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-302-5-0835

261 303. Coaching and Umpiring Baseball. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-303-5-0835

261 304. Coaching and Officiating Track and Field. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-304-5-0835

261 305. Coaching and Officiating Football. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-305-5-0835

261 309. Coaching and Officiating Tennis and Golf. (2). Study of rules, theory and practices; methods of coaching. Pr.: HPER 202, 203, 204 or 290. 261-309-5-0835

261 315. Treatment of Athletic Injuries. (3). Principles and practices of massage, taping and care of minor athletic injuries. Pr.: Junior standing and HPER 202, 203, 204 or 290. 261-315-0-0835

261 331. Individual Activities for Secondary Schools. (3). Theory and practice of selected activities from the following list: archery, badminton, tennis, bowling, golf, fencing and wrestling. One hour rec. and four hours lab. a week. Required for secondary program. 261-331-3-0835

261 341. Water Safety Instruction. (2). Methods of teaching swimming, lifesaving, and water safety. Upon satisfactory completion of this course, a certificate is awarded by the American Red Cross as a water safety instructor. Not open to students in Health, Physical Education and Recreation. Pr.: A current senior lifesaving certificate. 261-341-0-0835

261 345. Water Safety Instruction. (2). Methods of teaching swimming, lifesaving and water safety. Upon satisfactory completion of this course, a certificate is awarded by the American Red Cross as a water safety instructor. For majors in Health, Physical Education and Recreation only. Pr.: A current senior lifesaving certificate. 261-345-0-0835

261 355. Movement Exploration. (3). A study of a problem-solving approach to teaching movement and motor skills to elementary school children. One hour rec. and four hours lab. a week. 261-355-0-0835

261 359. Organization and Administration of Athletics. (3). A study of the organization of athletics, including budgeting, equipment, legal aspects and public relations. Pr.: Junior standing. 261-359-0-0835

261 379. Physical Education for the Elementary School Teacher. (3). Materials, techniques, and programs in physical education activities suitable for the different age periods in the elementary school. Two hours rec. and two hours lab. a week. Pr.: Sophomore standing and Educ. 202 or consent of instructor. Not open to majors in Health, Physical Education and Recreation. 261-379-7-0835

261 399. Sophomore Honors Seminar. (1-3) I 1979.. Selected topics in health, physical education, recreation, and dance. Open to non-majors in the Honors Program. 261-399-4-4900

261 458. Philosophy, History and Principles of Physical Education. (3) I, II. Study of the historical and philosophical foundations of physical education, and a survey of the principles of physical education. Pr.: 261-206. 261-458-0-0835

261 460. Practice Teaching in Physical Education. (2). Supervised students assist in basic physical education classes. Four hours lab. a week. Pr.: Junior standing. 261-460-2-0835

261 461. Observation in Elementary Physical Education. (2) I, II. Experiences in observing elementary children in the physical activity setting. One hour of recitation a week with laboratory hours to be arranged. Pr.: Junior standing and one or more courses in Elementary Physical Education. 261-461-5-0835

261 463. Laboratory Practicum in Physical Education. (1-2) I, II, S. Supervised students assist in laboratory. Four hours lab. a week. Pr.: Jr. standing and appropriate background for problem undertaken. 261-463-2-0835.

261 499. Senior Honors Thesis. (2). Open only to seniors in the Arts and Sciences honors program. 261-499-4-0835

Undergraduate And Graduate Credit In Minor Field

261 515. 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 History 515.) 241-515-0-2205

261 535. Nutrition and Physical Activity. (3). The study of nutrition concepts, physical activity and their interrelationships. Emphasis will be on weight control; fads and fallacies of diet; physical fitness; and athletics. Pr.: Biol. 198 and consent of instructor. (See Foods and Nutrition 535.) 261-535-0-0835

261 561. Adapted Physical Education. (3). I, II. Developmental, Remedial and Corrective Physical Education. Emphasis placed on adaptations designed to meet the needs of individuals requiring special attention beyond the regular physical education program. Pr.: Biol. 215; HPER 290. 261-561-0-0835

261 565. Physiology of Excerise. (4). The health benefits of exercise including energy metabolism, ergogenic aids to performance, and theoretical considerations of training and fitness development. The role of exercise in child development and the physiological implications of aging. Three hours rec. and two hours lab. a week. Pr.: Biol. 240. 261-565-8-0835

261 570. Motor Behavior and Skill Learning. (3). A study of learning in the psychomotor domain. Specific areas of study include motor learning theories, motor development, physiological bases of skill behavior, motor and skill learning, the state of the performer, and the application of instructional techniques. Two hours rec. and two hours lab. a week. 261-570-7-0835

261 586. Administration of Health and Physical Education in Elementary and Secondary Schools. (3) I, II. Policies and procedures in organization and administration, with emphasis on elementary and secondary school health and physical education. Pr.: Junior standing. 261-586-0-0835

261 599. Independent Studies in Health, Physical Education and Recreation. (1-3). Selected topics in health, physical education and recreation. Maximum of three hours applicable toward a degree. Pr.: Consent of department head. 261-599-3-0835

Undergraduate And Graduate Credit

261 700. Principles and Philosophy of Physical Education. (3). Study of historical and philosophical foundations of physical education and an analysis of the principles of physical education. 261-700-0-0835

261 701. Sport and Human Behavior. (3). A study of the state of the sport performer and the effects of sport on human behavior. Pr.: HPER 570. 261-701-0-0835

261 702. HPER Workshop. (1-3) I, II, S. Intensified study of new and innovative techniques used in health, physical education or recreation. 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. 261-702-0-0835

261 710. Tests and Measurements in Physical Education. (3). Techniques of measuring and evaluating, including elementary statistical procedures, the preparation and administration of skill and written tests, and the use of other evaluative materials. Pr.: HPER 208, 252, 355, 241 or 331, HPER 266, 251, 242. 261-710-0-0835

261 718. Film Analysis of Sport. (3). The analysis of human movement using film, tape and other related aids. Pr.: HPER 290. 261-718-0-0835

261 730. Minority Groups in Sports. (3). The contributions, problems, and discrimination of minority groups in sport. Pr.: Soc. 211, HPER 230, Psych. 435, or Hist. 539. 261-530-0-0835

261 731. Physical Education Curriculum for the Secondary School. (3). Organization of material in a progression for a secondary school physical education program. Pr.: C&I 476. 261-731-0-0835

261 732. Physical Education Curriculum for the Elementary School. (3). Organization of material in a progression for an elementary physical education program. Pr.: C&I 469. 261-732-0-0835

261 745. Sociology of Sport. (3). A critical analysis of sport and leisure activity in contemporary American society, focusing on such issues as sport participation and social mobility, race and sports, women and sports, and audience involvement (see Soc. 645). Pr.: Soc. 211. 261-745-0-0835

261 750. Teaching Concepts of Physical Education. (3). A study of teaching methods applied to instruction of the basic concepts of physical education; organization of teaching materials for a foundations or conceptual program on physical education. 261-750-0-0835

261 759. Organization, Implementation, and Administration of Exercise Programs. (4). A study of the organization, implementation and administration of exercise programs, which include physical fitness testing, budgeting, equipment, legal aspects, publicity, public relations program management, and theory and practical use of various exercise regimes. Three hours rec. and two hours lab. a week. Pr.: HPER 565 and consent of instructor. 261-759-1-8-0835

261 775. Seminar in Physical Education. (Var.) Recent trends and problems in physical education. Pr.: Senior standing and consent of instructor. 261-775-0-0835

261 799. Problems in Health, Physical Education and Recreation. (Var.) Pr.: Background of courses needed for problem undertaken. 261-799-3-0835

Graduate Credit

261 800. Advanced Physiology of Exercise. (4). Effects of exercise on the human organism with special emphasis on current research in sport medicine and exercise science. Pr.: HPER 565. 261-800-1-8-0835

261 801. Motor Behavior Seminar. (3). Current trends, problems and topics related to psychomotor learning, motor development and the psychology of coaching. Pr.: HPER 570. 261-801-0-0835

261 802. The Athletic Directorship. (3). On demand. The administration of the inter-collegiate or inter-scholastic 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.: HPER 359 or 405-611. 261-802-0-0835

261 810. Evaluation in Physical Education. (3). A study of basic techniques used to evaluate objectives, conduct research, and conduct laboratory experiments in physical education. Pr.: HPER 710. 261-810-0-0835

261 815. Research Methods in Health, Physical Education and Recreation. (3). A study of techniques of research including the design of experiments and the use of appropriate statistics. 261-815-0-0835

261 820. Supervision of Physical Education. (3). A study of the objectives, organization, and methods of supervising elementary and secondary physical education programs. 261-820-0-0835

261 825. Mechanical Analysis of Human Movement. (3). A study of mechanical principles applied to analysis of human movement including cinematographical analysis of sports activities. Pr.: HPER 290. 261-825-0-0835

261 830. The Child in Sport. (3). On demand. Factors prompting children's entry into sports and the consequences of participation in organized sports for children. Pr.: HPER 570 or 405-215. 261-830-0-0835

261 835. Physical Education for the Atypical. (3). On demand. Techniques for assesing the needs and functioning level of exceptional people of all ages; and steps in developing and evaluating programs. Two hours lectureand two hours lab. Pr.: 261-561 or 405-622. 261-835-1-3-0835

261 896. Topics in Health, Physical Education and Recreation. (1-4). 261-896-3-0835

261 897. Research in Health, Physical Education and Recreation. (Var.) Pr.: Sufficient training to carry on the line of research undertaken. 261-897-4-0835

261 898. Master's Report (1-4). 261-898-4-0835

261 899. Master's Thesis (1-6). 261-899-3-0835

Courses in Dance

Undergraduate Credit

261 251. Rhythms for Secondary Schools. (3). Fundamental rhythms, techniques and materials for teaching folk, square, modern and social dance in secondary schools. One hour rec. and four hours lab. a week. Required for secondary program. 261-251-3-1008

261 252. Rhythms for Elementary Schools. (3). An introduction to and techniques of basic dance moves, includng creative, folk, country, and square for grades K-6. One hour rec. and four hours lab. a week. 261-252-1-0835

261 323. Techniques of Intermediate Modern Dance. (2). Pr.: HPER 120 and 121. 261-323-3-1008

261 324. Techniques of Advanced Modern Dance. (2). Pr.: HPER 323 (four hours) and/or consent of instructor. May be repeated for a total of eight hours. 261-324-0-1008

261 325. Techniques of Intermediate Ballet. (2). Pr.: HPER 165 and 166. 261-325-1-1008

261 326. Techniques of Advanced Ballet. (2). Pr.: HPER 325 (four hours) and/or consent of instructor. May be repeated for a total of eight hours. 261-326-0-1008

261 355. Movement Exploration. (3). A study of a problem-solving approach to teaching movement and motor skills to elementary school children. One hour rec. and four hours lab. a week. 261-355-3-1008

Undergraduate And Graduate Credit In Minor Field

261 500. Methods and Materials of Dance. (3). A theoretical and practical investigation of literal and abstract materials for the dance; methods of dance. One hour rec., four hours lab. per week. Pr.: HPER 323 (four hours) or 325 (four hours). 261-500-1-3-1008

261 501. Dance Composition. (3). Study of techniques of choreography. Emphasis is placed on practical application. One hour rec., four hours lab. per week. Pr.: HPER 500. 261-501-3-1008

261 502. Dance Workshop. (2) I, II. Studies in the techniques of dance production and performance. Emphasis is on practical application. May be repeated three times. Pr.: Four hours of HPER 323 or four hours of HPER 325. 261-502-1-0-1008

Courses in Health

Undergraduate Credit

261 201. Personal and Community Health. (3) I, II, S. Presents scientific and well-balanced information concerning personal, family and community health, so vitally essential to the individual in meeting the needs of daily living, professional, parent and community responsibilities. 261-201-0-0835

261 250. You and Your Sexuality. (3). Study of the role and meaning of human sexuality in relation to oneself as well as in interrelationships with others. Limited to freshmen and sophomores only. (Same as F.C. Dev. 250.) 261-250-0-0835

261 373. First Aid (Multimedia). (1). I, II, S. First aid training for prevention and treatment of injuries in an emergency. Upon satisfactory completion of this course, a certificate is awarded by the American Red Cross. Not open to students in Health, Physical Education and Recreation. 261-373-1-0835

261 365. Health, Illness and Death. (3) I, II. Basic concepts of positive health, and the relationship and effects of illness, dying and death. Pr.: 261-201. 261-365-0-0837

261 376. First Aid (Multimedia). (1) First aid training for prevention and treatment of injuries in an emergency. Upon satisfactory completion of this course, a certificate is awarded by the American Red Cross. For majors in the Department of Health, Physical Education and Recreation only. 261-376-3-0835.

261 377. First Aid (Multimedia Instructors). (1). Education in methods of teaching the American Red Cross Multimedia first aid course. Upon successful completion of the course the student is certified as a multimedia instructor. For majors in the Department of Health, Physical Education and Recreation only. Pr.: Current certification in multimedia first aid. 261-377-3-0835

261 378. First Aid (Basic Instructors). (1). Training in methods of teaching basic first aid measures to young children. For majors in Department of Health, Physical Education and Recreation only. Pr.: Current certification in first aid (multimedia) or current teaching certificate in any teaching field. 261-378-3-0835

261 381. Health for Elementary Teachers. (3). To assist the student in the development of the understandings and competencies essential for the teaching of health in elementary schools. 261-381-0-0835

261 385. Consumer Health and Quackery. (3) I, II. To understand the health implications of quackery and evaluating health services and products. Pr.: 261-201. 261-385-0-0837

261 462. Practicum in Health. (2). Supervised students assist in personal health classes. Four lab. hours a week. Pr.: Junior standing. 261-462-2-0835

Undergraduate And Graduate Credit In Minor Field

261 550. Health Appraisal. (3). Study of health appraisal information, correction and follow-up procedures needed for screening and identifying health problems and concerns. Pr.: HPER 201; Psych. 110. 261-550-0-0835

261 555. Community Health. (3). Identification of local, state, and national health problems; programs and agencies designed to meet these problems. Emphasis on principles, objectives, and methods of community health planning. Pr.: HPER 201 and Biol. 198. 261-555-0-0837

261 583. Current Health Issues. (3). A study and discussion of current issues of concern such as drug abuse, sexuality, human diseases and relationship of ecology to health. Pr.: Junior standing. 261-583-0-0835

261 585. Field Experience and Internship in Health. (3-8). Observation and participation in activities of a public health agency either official, voluntary or private. Internship may also be in nursing home and hospital setting. Planning and supervision of experience is done jointly by university staff members and agency representatives; can be repeated once. Pr.: Must notify instructor semester before taking class and HPER 555. 261-585-2-0837

Undergraduate And Graduate Credit

261 736. Health Education Curriculum. (3). I, II, S. Organization of material and concepts in a neede-based progression for a secondary school health education program. Pr.: 415-476. 261-736-0-0837

261 740. Administration of Health Care Programs. (3). Organization and administration of school health programs concerning health services, health instruction, and health environment. Emphasis will also be placed on various community health agencies such as public, private and voluntary. Two recitations and two lab. hours a week. Pr.: HPER 583 or 555. 261-740-0-0835

261 747. Drugs and the Student. (3). Current problems and programs relative to drug use, abuse and control. Pr.: HPER 201, Psych. 110 and restricted to students with senior standing in Health, Physical Education and Recreation. 261-747-0-0837

261 765. Human Sexuality. (3). Focus on implications of personal and familial aspects of human sexuality throughout the life cycle. Pr.: F.C. Dev. 350 or Biol. 240. 261-765-0-0837

261 780. Seminar in Health Education. (Var.). Recent trends and problems in health education. Pr.: HPER 486 and consent of instructor. 261-780-0-0835

Courses in Recreation

Undergraduate Credit

261 220. Recreational Games. (2). Lead-up and recreational games suitable for use in both recreation and school settings. Four hours lab. a week. 261-220-0-0835

261 320. Recreational Leadership. (3). Principles and methods of organizing communities for leisure activities. 261-320-0-0835

261 382. Camp Counseling. (3). Basic principles and skills in camping for future counselors. Pr.: Sophomore standing or consent of instructor. 261-382-0-0835

261 390. Principles and Philosophy of Recreation. (3). A study of the basic principles of recreation, including a survey of past and current trends in the recreation movement. 261-390-0-0835

261 480. Introduction to Recreation. (2). To orient the student to recreation programs in voluntary, public, military, private and commercial agencies. 261-480-2-0835

261 481. Participation in Recreation. (2). I, II. Directed beginning experience in recreation/leisure service agencies. An evaluation and reports on experiences within the agencies will be done. Pr.: 261-320. 261-481-2-2103

261 488. Recreation for Special Populations. (3). I, II. Study of recreation programs for special populations. Characteristics of the disabled, disadvantaged, mentally ill, retarded, aged, physically handicapped, etc. Pr.: 261-320 and consent of instructor. 261-488-0-2103

261 489. Recreation Program. (3). I, II. A study of the program forms and structures related to public, voluntary, military, private and commercial agencies. Pr.: 261-480. 261-489-0-2103

261 490. Recreation Administration I. (3). I, II. Development and evaluation of recreation patterns, programs and structures. Pr.: 261-480. 261-490-0-2103

261 491. Seminar in Recreation. (2). I, II. The study of current trends and issues in recreation. Pr.: 261-481. 261-491-0-2103

261 492. Internship in Recreation. (15). I, II, S. Intensive practical experience over a 15-week period in an approved recreation/leisure service agency. Pr.: 261-491. 261-492-2-2103

261 493. Therapeutic Recreation Service. (3) II. The development of competencies in servicing special populations in public and institutional settings. Examination of medical and non-medical models of implementation service. Pr.: HPER-488 or consent of instructor. 261-493-0-2103

Undergraduate And Graduate Credit

261 705. Recreation Theory and Policy. (3). I, II. Development of theory and resulting recreational policies for public, community, institutional and private agencies. Pr.: 261-489. 261-705-0-0835

261 715. Recreation Program, Finance and Budget. (3). I, II, S. Development of recreation programs and programmatic budgets for a recreation agency. Study of sources for financing recreational programs of all types and a study of money management systems for recreation agencies. Pr.: 261-489 or 261-705. 261-715-0-0835

261 720. Organization and Administration of Intramural Programs. (3). Policies and procedures in organizing and administering an intramural program. 261-720-0-0835

261 725. Recreation Administration II. (3). Development of administrative procedures as applied to programs, personnel and facilities. Design administrative models and apply theories to the recreation/leisure field. Pr.: 261-490. 261-725-0-2103

261 791. Seminar in Recreation. (1-3). Designed for recreation specialists. Discussion of current research and innovations. Evaluation of recreational programs. Small group interaction. May be taken with Internship in Recreation. 261-791-0-0835

261 792. Internship in Recreation. (3-8). Supervised experiences with recreation services, such as city recreation, government agencies, and other recreation agencies. May be completed in one of the following two ways, as directed by the student's adviser: a) summer assignment in an approved agency with concurrent enrollment in the smmer school course designation; b) half-time assignment during a full semester, or full-time assignment during a semester in an approved or supervised recreation job, both with concurrent enrollment in the course designation. May be repeated once. HPER 791 (may be taken concurrently) and consent of instructor. 261-792-2-0835

461 862. Leisure Counseling. (3) II. The development of lesiure counseling models for use in community and institutional recreation programs and skilland competencies in assesing, interviewing, and counseling individuals and groups in the use of leisure experiences. Pr.: HPER 725 or A & F 858. 261-862-0-2103

HISTORY

Joseph M. Hawes, Head of Department*

Professors Carey,* Higham,* Jones,* Kaufman,* Kren,* Linder,* Socolofsky,* and Wilcoxon;* Associate Professors Hamscher,* Hawes,* McCullogh,* Mrozek,* Kipp,* and Page;* Assistant Professors Donovan,* Ferguson,* Frey,* Gray,* Nieman,* and Sealander.* Emeritus: Professors Parrish,* Sageser,* and Sweedlun;* Associate Professors Alsop* Crawford* and Riggs.*

History is the common possession of mankind. In

the words of historian Carl Becker, "The value of history is . . . not scientific but moral: by liberalizing the mind, by deepening the sympathies, by fortifying the will, it enables us to control, not society, but ourselves,—a much more important thing; it prepares us to live more humanely in the present and to meet rather than to foretell the future." Historical understanding is the basic attribute of the educated person.

Many history majors pursue careers in law, medicine, business, religion, education, government, the armed services, historic preservation, journalism and other professions. Undergraduate advisers 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.

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 non-traditional 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.

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 college, only courses equivalent to those taught at the freshman-sophomore level at Kansas State University (courses numbered 241-100 through 241-299) can receive credit for the history major.

Undergraduate Study

Requirements for a major in history consist of a minimum of 30 hours in history, including Hist. 101 and 102, a minimum of 18 hours in courses numbered 500 and above and Hist. 397 in the junior year. Students must distribute their upper division courses over at least three of the following fields:

I. ancient, medieval and early modern Europe
II. modern Europe (including Great Britain)
III. the third world (Asia, Africa, Latin America)
IV. the United States (including the colonial period)
V. topical courses not focusing upon a specific geographical region, such as history of science, technology, dance, sport, military history, psychohistory and other similar courses.

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 non-thesis, non-report 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 or American history, two special fields in history and an outside minor field. 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 on page 99. It also publishes **Military Affairs,** the journal of military, naval and air history, theory and technology.

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

241 100. Introduction to History. (3). 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. 241-100-0-2205

241 101. Western Civilization: The Rise of Europe. (3). Major trends in western history from the beginnings of European civilization to the end of the 17th 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. 241-101-0-2205

241 102. Western Civilization: The Modern Era. (3). Principal developments in western civilization from the beginning of the 18th 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. 241-102-0-2205

241 200. Topics in History for Freshmen and Sophomores. (3). Exploration of the historical dimensions of a particular topic or theme. Topics vary. May be repeated once. 241-200-0-2205

241 250. Russian Culture and Civilization. (3). I. Russia's past and present in the light of principle ideologies with emphasis upon fine arts, literature, music, religion, politics, an education. Equal time will be given to the Tsarist and the Soviet period. Knowledge of Russian language is not required. (Same as Modern Language 250). 241-250-0-2205.

241 251. 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. 241-251-0-2205

241 252. 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. 241-252-0-2205

241 397. Junior Seminar. (3). Provides for the study of the historical method for students in their junior year. Emphasis upon both research techniques and writing. 241-397-0-2205

241 398. Sophomore Honors Seminar in History. (3) I 1979. Selected topics in history. May be repeated once for credit. Pr.: Membership in Honors Program or consent of instructor. 241-398-0-4900

241 401. Technology, Science, and History. (3) II. A nontechnical historical survey of the more significant interactions of technology and science with life and thought in the western world. 241-401-0-2205

241 499. Senior Honors Thesis in History. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 241-499-4-2205

Undergraduate And Graduate Credit In Minor Field

241 501. Heritage of the Western World. (4-6). The heritage and legacies of western civilization especially designed for the non-major; the emphasis is upon broad themes in the evolution of the political, economic, social, cultural and ideological inheritance. May not be used to fill major requirement in History. Pr.: Sophomore standing. 241-501-0-2205

241 505. Introduction to the Civilization of South Asia I. (3). Interdisciplinary survey of the development of civilization in South Asia, including consideration of the geographical and demographic context, philosophical and social concepts, social and political institutions, literature and historical movements. (Same as Geog. 505, P.Sci. 505, Soc. 505, Anthro. 505.) 241-505-0-2205

241 506. Introduction to the Civilization of South Asia II. (3). Interdisciplinary survey of recent and contemporary civilization in India, Pakistan, Ceylon, Nepal and Afghanistan, including recent history, current economy, religion, culture, language and literature, geography, social and political structure and ideas. (Same as Geog. 506, P.Sci. 506, Soc. 506, Anthro. 506). 241-506-0-2205

241 509. History of Childhood. (3). Examines some theoretical positions on childhood (Freud, Erikson, DeMause, Rheingold and others), and then attempts to determine what it meant to be a child at various times in the past, from Greek and Roman antiquity to 20th century Europe and America. Concentrates on such questions as infanticide, child beating, toilet training, swaddling and methods of schooling, as well as the impact of religious and secular ideologies on the theory and practice of child- raising. Pr.: Sophomore standing. 241-509-0-2205

241 510. History of Marxism: Theory and Praxis. (3) II alt. yrs. 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. 241-510-0-2205.

241 511. 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. 241-511-0-2205

241 512. Women in European History. (3) II. 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. 241-512-0-2205

241 513. Battles and Leaders. (3) I. 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. 241-513-0-2205

241 515. 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. (Same as HPER 515.) Pr.: Sophomore standing. 241-515-0-2205

241 516. History of Science I. (3) I. Scientific activity and thought from antiquity to the end of the 16th century, with emphasis on Greek, late medieval and Renaissance science. No background in science required. Pr.: Sophomore standing. 241-516-0-2205

241 517. History of Science II. (3) II. Science in the 17th and 18th 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. 241-517-0-2205

241 518. Science in the Modern Age. (3) I. Science since the 18th 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. 251-518-0-2205.

241 521. History of Christianity. (3). 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. 241-521-0-2205

241 522. Religion in American History. (3) II alt. yrs. 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. 241-522-0-2205.

241 523. A History of the Occult and Witchcraft. (3) 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. 241-523-0-2205.

241 525. Colonial America. (3). About 1450 to 1763. Includes the European background of North American colonization, the rivalry for new world empire, 17th century English colonial foundations, and development of the various colonial societies. Pr.: Sophomore standing. 241-525-0-2205

241 526. The American Revolution. (3). 18th 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. 241-526-0-2205

241 527. The Early National Period. (3). 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. 241-527-0-2205

241 528. The Age of Jackson. (3). 1815-1848. Political party instability in the aftermath of the War of 1812, emergence of modern political parties in the 1830s and 1840s, the transportation revolution and growth of societal interdependence, the nature of antebellum reform. Emphasis is on the problem of social order and the relation of the individual to society in a period of rapid and fundamental change. Pr.: Sophomore standing. 241-528-0-2205

241 529. Civil War and Reconstruction. (3). 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 postwar settlement. Emphasis is on the attempt of mid-19th-century American leaders to deal with the complex problems of slavery and race. Pr.: Sophomore standing. 241-529-0-2205

241 530. Populism and the Progressive Movement. (3). "The Gilded Age," "Populism," and "The Progressive Movement" as significant developments in the American scene, 1877-1914, provide the emphasis for this course. An understanding of the nature of American life, with concentration on activities of "typical" Americans, is a major goal of this course. Pr.: Sophomore standing. 241-530-0-2205

241 531. The United States in the Twentieth Century. (3). 1917 to the present. Efforts are made to deal with ethnic, cultural and social as well as political, economic and diplomatic themes. Pr.: Sophomore standing. 241-531-0-2205

241 533. Topics in the History of the Americas. (3) 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. 241-533-0-2205.

241 535. History of the South. (3). Survey of southern history from the colonial period to the present. Origins and growth of slavery and the plantation system, the nature of society in the slave South, the impact of the Civil War and emancipation on southern society, the emergence of the "New South" in the late 19th and early 20th centuries. Pr.: Sophomore standing. 241-535-0-2205

214 537. History of the Indians of North America. (3). 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. 214-537-0-2205.

241 539. Black American History. (3). Blacks in America from the 17th 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. 241-539-0-2205

241 541. Women in American History. (3). 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. 241-541-0 05

241 543. The United States and World Affairs, 1776- Present. (3) I. 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 20th century. Pr.: Sophomore standing. 241-543-0-2205

241 544. History of U.S.-Soviet Relations Since 1917. (3) II alt. yrs. History of U.S.-Soviet relations since 1917 with emphasis on WWI and the New Dipolmacy; from Non- Recognition 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. 241-544-0-2205

241 545. War in the Twentieth Century. (3) 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 20th century, including civil wars, "total war," and guerrilla warfare. Pr.: Sophomore standing. 241-545-0-2205.

241 546. History of American Military Affairs. (3) 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. 241-546-0-2205.

241 548. American Business History. (3). 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. 241-548-0-2205

241 550. American Economic History. (3). 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. 241-550-0-2205

241 552. American Social History. (3). Evolution and development of American social institutions, including marriage, sexual customs, ethnicity and community problems. Also emphasizes the different methodologies used in writing social history. Pr.: Sophomore standing. 241-552-0-2205

241 555. American Constitutional History. (3). 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 is designed to offer insight into the relationship of constitutional-legal institutions to American society. Pr.: Sophomore standing. 241-555-0-2205

241 557. History of American Agriculture. (3). 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. 241-557-0-2205

241 558. History of Kansas. (3). Land, people, and cultural developments in Kansas, from the earliest written records to the present. Designed to provide the student with an intimate understanding of the state of Kansas. Pr.: Sophomore standing. 241-558-0-2205

241 560. Latin American Nations. (3). 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 fifty years. Pr.: Sophomore standing. 241-560-0-2205

241 561. Colonial Hispanic America. (3). 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. 241-561-0-2205

241 562. Modern Mexico. (3). Brief survey of lines of national development, 1821-1910, and major emphasis on the 20th-century Revolution and its reforms (1910-1940) as well as its subsequent implications. Pr.: Sophomore standing. 241-562-0-2205

241 563. Topics in Comparative History. (3). Investigation in detail of a particualr theme, event or problem in comparative history. Topics vary. May be repeated once for credit. Pr.: Sophomore standing. 241-563-0-2205.

241 565. History and Culture of Greece. (3). 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. 241-565-0-2205

241 566. History and Culture of Rome. (3). 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. 241-566-0-2205

241 567. Europe in the Middle Ages. (3). Europe from the fall of the Roman Empire to the 13th 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. 241-567-0-2205

241 568. The Renaissance. (3). The Italian Renaissance as a major phase in the history of western civilization and its spread to Northern Europe. Pr.: Sophomore standing. 241-568-0-2205

241 569. The Reformation. (3). 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. 241-569-0-2205

241 570. Europe in the Age of Absolutism. (3). Surveys the economic, social, political and intellectual history of Western Europe in the 17th 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. 241-570-0-2205

241 571. Revolutionary Europe. (3). 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. 241-571-0-2205

241 572. Nineteenth-Century Europe. (3). 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. 241-572-0-2205

241 573. Twentieth-Century Europe. (3). 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 anti-democratic and non-democratic 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. 241-573-0-2205

241 574. Europe since World War II. (3). Post-war 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. 241-574-0-2205

241 576. European Diplomatic History I. (3). 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. 241-576-0-2205.

241 577. European Diplomatic History II. (3). The nature, evolution, and functions of the European diplomatic system from 1815 to the present. Includes a study of the personality and roles of prominent rulers, spies, and diplomats. Focuses on the Vienna settlement, Bismarckian diplomacy, international developments between the two World Wars, and the Cold War. Pr.: Sophomore standing. 241-577-0-2205.

241 579. England to 1603. (3). 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. 241-579-0-2205

241 580. England since 1603. (3). English society and politics in modern times. Emphasis on topics such as the three orders of society (king, lords and commons), the English church, the rise of the House of Commons, the extension of the vote and relations with Scotland and Ireland. Pr.: Sophomore standing. 241-580-0-2205

241 581. Topics in British History. (3). Provides instructor and students the opportunity to investigate in detail a particular theme, event or problem in British history. Topics vary. May be repeated for credit. Pr.: Sophomore standing. 241-581-0-2205

241 583. History of France, 1400-1715. (3). 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. 241-583-0-2205

241 584. History of France since 1715. (3). 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 18th 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. 241-584-0-2205

241 585. Topics in French History. (3). Provides instructor and students the opportunity to investigate in detail a particular theme, event or problem in French history. Topics vary. May be repeated for credit. Pr.: Sophomore standing. 241-585-0-2205

241 587. Modern Germany, 1789-1914. (3). 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. 241-587-0-2205

241 588. Modern Germany, 1914-1945. (3). 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. 241-588-0-2205

241 589. Topics in German History. (3). Provides instructor and students the opportunity to investigate in detail a particular theme, event or problem in German history. Topics vary. May be repeated for credit. Pr.: Sophomore standing. 241-589-0-2205

241 591. History of Russia to 1801. (3). 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. 241-591-0-2205

241 592. Grandeur and Decline of Imperial Russia. (3). Russia in the 19th 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. 241-592-0-2205

241 593. Topics in Russian History. (3). Provides instructor and students the opportunity to investigate in detail a particular theme, event or problem in Russian history. Topics vary. May be repeated for credit. Pr.: Sophomore standing. 241-593-0-2205

241 595. Modern European Culture. (3) On demand. Major developments in European thought in the nineteenth and twentieth centuries, concentrating on the origin and development of major ideologies. Topics include: Romanticism, Liberalism, Socialism, Fascism, Existentialism and the revolution in science. Pr.: Sophomore standing. 241-595-0-2205.

241 596. Holocaust: The Destruction of the European Jews. (3) I alt. yrs. Analysis of the attempts by the National Socialist government of Germany to exterminate the Jewish population of Europe. Major issues discussed will include: ninetenth-century anti-democratic and anti-semitic movements; Hitler's concept of anti- semitism 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. 241-596-0-2205.

241 597. Topics in European History. (3). 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. 241-597-0-2205

241 599. 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. 241-599-0-2205.

Undergraduate And Graduate Credit.

241 655. Medieval Religion and Politics. (3). 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. 241-655-0-2205

241 701. South Asian History I. (3). An introductory survey of the growth of Indo-Muslim civilization in South Asia covering the present territory of Bangladesh, India, Pakistan and Ceylon plus the mountain countries of Afghanistan, Nepal, Bhutan and Sikkim. Emphasis on the religions of South Asia (Hinduism, Buddhism, Islam and Sikhism), caste, and South Asian culture and the accomplishments of its ancient philosophy and great empires. No background in South Asia is required. Pr.: Sophomore standing. 241-701-0-2205

241 702. South Asian History II. (3). Examines the creation of the British Indian Empire with its unique imperial lifestyle the development of South Asian culture—part Western and part traditional—the rise of anti-British nationalism and the competition among differing nationalist dreams that culminated in the creation of the new states of India, Pakistan, Bangladesh and Ceylon. The civilization of South Asia, imperialism, and anti-colonial nationalism. No background in South Asia is required. Pr.: Sophomore standing. 241-702-0-2205

241 707. Topics in Non-Western History. (3). On 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. 241-707-0-2205

241 710. Theories and Methods of Psychohistory. (3). 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. 241-710-0-2205

241 717. History of American Culture. (3). Main emphasis is on political, religious and social thought and ideology, 1620 to present. Pr.: Sophomore standing. 241-717-0-2205

241 719. Science in America. (3). 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. 241-719-0-2205

241 720. The Scientific Revolution. (3). The introduction of a new world view during the 16th and 17th centuries. Provides an appreciation and understanding of the old Medieval Aristotelian world view, the great changes in thought associated with Copernicus, Kepler, Galileo, Harvey, Bacon, Descartes, Newton, and others, and the effect of these changes on scientific and educational institutions, medicine, technology, and religion. Pr.: Sophomore standing. 241-720-0-2205

241 721. American Ethnic History. (3). The role of ethnic minorities in American history, emphasizing non-western-European immigrant groups. Pr.: Sophomore standing. 241-721-0-2205

241 723. American Urban History. (3). The role of the city in American history, emphasizing the process of urbanization. Pr.: Sophomore standing. 241-723-0-2205

241 725. American Labor History. (3). Labor as an institutional development (organized labor) and as a general theme in American history. Emphasis on the period after 1877 with focus on contemporary issues. Pr.: Sophomore standing. 241-725-0-2205

241 728. Frontier America. (3). Primary emphasis on the 19th century when Americans were rapidly spreading across the continent. Also examines the earlier developments of the frontier and considers the 20th-century role of the trans-Mississippi. Pr.: Junior standing or consent of instructor. 241-728-0-2205

241 729. The Great Plains. (3). Through concentration on the one-fifth of North America identified as the Great Plains, an effort is made to present the development of that region in historic times. Pr.: Junior standing or consent of instructor. 241-729-0-2205

241 741. Technology and War. (3). From the development of weapons to 1900 emphasizing problems of development in technology and their relationship to war, and military organization and the role of leadership. Pr.: Sophomore standing. 241-741-0-2205

241 745. History of Military Thought. (3). The development of military thought and theory from Machiavelli to the present, to give the student a knowledge of classical military literature. Pr.: Sophomore standing. 241-745-0-2205

241 766. Modern Eastern Europe. (3). Eastern Europe as an ethnically diverse region located between the Germanic lands and Russia emphasizing the impact of both external and internal forces upon the political, socio-economic, 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 or consent of instructor. 241-766-0-2205

241 769. The Russian Revolutions and the Soviet System. (3). 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 Destalinization: prospects for the Soviet system. Pr.: Junior standing or consent of instructor. 241-769-0-2205

241 780. Rise and Fall of the House of Hapsburg. (3). Analyzes 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 20th century. Pr.: Sophomore standing. 241-780-0-2205

241 798. Readings in History. (1-3). Students will read on a central theme, attend weekly discussions, and write a final report. 241-798-3-2205

241 799. 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. 241-799-3-2205

Graduate Credit

241 801. 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. 241-801-0-2205

241 808. Quantification in History. (3). A course for graduate students in the methodology of research using computer techniques. Stress is placed on acquiring bibliographical expertise as well as familiarity with computer technology. Pr.: Stat. 330 or equiv. 241-808-0-2205

241 899. Research in History, M.A. (Var.) 241-899-4-2205

241 901. 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. 241-901-4-2205

241 919. Seminar in History of Christianity. (3). 241-91 -2205

241 920. Seminar in American Social History. (3). 241-920-0-2205

241 921. Seminar in Latin American History. (3). 241-921-0-2205

241 922. Seminar in American Diplomatic History. (3). 241-922-0-2205

241 923. Seminar in the History of the American West. (3). 241-923-0-2205

241 924. Seminar in Colonial America. (3). 241-924-0-2205

241 926. Seminar in American Economic History. (3). 241-926-0-2205

241 927. Seminar in American Science and Technology. (3). 241-927-0-2205

241 928. Seminar in American History. (3). 241-928-0-2205

241 930. Seminar in Modern European History. (3). 241-930-0-2205

241 931. Seminar in German History. (3). 241-931-0-2205

241 932. Seminar in French History. (3). 241-932-0-2205

241 933. Seminar in European Diplomatic History. (3). 241-933-0-2205

241 935. Seminar in Modern Russian History. (3). 241-935-0-2205

241 936. Seminar in Renaissance and Reformation. (3). 241-936-0-2205

241 937. Seminar in British History. (3). 241-937-0-2205

241 940. Seminar in Military History. (3). 241-940-0-2205

241 950. Seminar in South Asian History. (3). 241-950-0-2205

241 979. Seminar in the History of Science. (3). 241-979-0-2205

241 980. Topics in European History. (1-3). 241-980-0-2205

241 981. Topics in Third World History. (1-3). 241-981-0-2205

241 982. Topics in the History of Science. (1-3). 241-982-0-2205

241 983. Topics in Military History. (1-3). 241-983-0-2205

241 984. Topics in American History. (1-3). 241-984-0-2205
241 985. Readings in History. (1-3). 241-985-3-2205
241 986. Problems in History. (1-3). 241-986-3-2205
241 999. Research in History, Ph.D. (Var.). 241-999-4-2205

INTERCOLLEGIATE ATHLETICS

John Jermier, Head of Department and Athletic Director

Coaches Akers, B. Anderson, P. Anderson, Baker, Dickey, Dwight, Hartman, Ross, and Snodgrass; Assistant Coaches Darnell, Davie, Donnan, Eads, Franchione, Latimore, Schroeder, Selmer, Thompson and Walstad; Sports Information Director Stone, Assoc. Director Habiger; Trainers Morgan, Goering, and Rudd; Administrative Staff Bocchi, Colbert, Nay and VanLaningham.

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. In addition, the women's program also competes in Region VI of the National Association of Intercollegiate Athletics for Women.

Intercollegiate competition is open to all students and is coached by staff members who are specialists in their respective fields.

The men's intercollegiate program competes in football, basketball, baseball, track (indoor and outdoor) and cross country, tennis and golf. The women's program offers competition in cross country, volleyball, basketball, swimming, track and field, softball, tennis and golf.

Courses in Intercollegiate Athletics

Undergraduate Credit

206 101. Varsity Baseball. (1) I, II. Pr.: Consent of instructor. 206-101-5-0899

206 102. Varsity Basketball. (1) I, II. Pr.: Consent of instructor. 206-102-5-0899

206 103. Varsity Cross Country. (1) I, II, Pr.: Consent of instructor. 206-103-5-0899

206 104. Varsity Football. (1) I, II. Pr.: Consent of instructor. 206-104-5-0899

206 105. Varsity Golf. (1) I, II. Pr.:Consent of instructor. 206-105-5-0899

206 106. Varsity Tennis. (1) I, II. Pr.: Consent of instructor. 206-106-5-0899

206 107. Varsity Track—Indoor. (1) I, II. Pr.: Consent of instructor. 206-107-5-0899

206 108. Varsity Track—Outdoor. (1) I, II. Pr.: Consent of instructor. 206-108-5-0899

206 109. Varsity Wrestling. (1) I, II. Pr.: Consent of instructor. 206-109-5-0899

207 150. Intercollegiate Basketball. (1) I, II. Pr.: Consent of instructor. 207-150-5-0899

207 152. Intercollegiate Track. (1) I, II. Pr.: Consent of instuctor. 207-152-5-0899

207 154. Intercollegiate Tennis. (1) II. Pr.: Consent of instructor. 207-154-5-0899

207 155. Intercollegiate Volleyball. (1) I. Pr.: Consent of instructor. 207-155-5-0899

207 156. Intercollegiate Softball. (1) II. Pr.: Consent of instructor. 207-156-5-0899

JOURNALISM AND MASS COMMUNICATIONS

Walter Bunge, Head of Department*

Professor Bunge;* Associate Professors Applegate, Bontrager,* Brown, Holt, Morris,* and Oukrop;* Assistant Professors Brown, Eaton, Fidler, MacFarland,* and Shaver;* Instructors Graf and Sparks; Visiting Professor Hacker.

The Department of Journalism and Mass Communications is one of 63 schools and departments in the United States whose news-editorial sequence is accredited by the American Council on Education for Journalism and is a member of the American Association of Schools and Departments of Journalism. In addition to permanent faculty members, the department annually appoints a journalist to fill a visiting professorship.

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. (See page 101). Beyond this they develop individualized programs within the framework of a broad, liberal arts education in consultation with their advisers. Only one-quarter of a student's total course work is taken in the department. To earn a major in the department requires a minimum of 90 credit hours outside the department and a minimum of 30 credit hours and a maximum of 34 credit hours within the department.

Courses in the department are in two areas: (1) those which focus on the relationship of mass communications to society; and (2) those designed for professional training and skill development. Students may select from several options within two majors.

Enrollment guides for majors are available in Kedzie Hall 104.

JOURNALISM AND MASS COMMUNICATIONS MAJOR

Requirements for all options listed below include a minimum of 90 credit hours outside the department and a minimum of 30 credit hours and a maximum of 34 credit hours within the department.

Required:

289 275	Reporting I	3
289 285	Reporting II (Print)	3
289 330	Editing I	3

Enough additional elective hours in Journalism and Mass Communications to total a minimum of 30 and a maximum of 34 hours.

RADIO-TELEVISION MAJOR

Required:

290 240	Fundamentals of R-TV Production	3
290 250	Fundamentals of R-TV Performance	3
290 260	R-TV Continuity	3
289 275	Reporting I	3
290 330	Reporting II (R-TV)	3

Select courses from the following groups to meet minimum requirements in each group.

Group I

290 355	KSDB-FM Participation	1
290 375	Cable TV Participation	1
290 640	Advanced Radio Production	3
290 650	Advanced Television Production	3

Students may take not more than 4 hours of participation courses and not more than 3 hours of either course. Minimum 4 hours; maximum, 7 hours.

Group II

290 660	History of Broadcasting	3
290 665	R-TV Regulation and Responsibility	3
290 630	R-TV Programming	3
290 685	R-TV Management	3

Minimum 3 hours; maximum 9 hours.

Group III

290 675	Broadcast Criticism	3
290 610	R-TV Drama Writing	3
290 615	R-TV Series Writing	3
290 620	R-TV Advertising	3

Minimum 3 hours; maximum 9 hours.

Electives

Remaining hours in journalism and mass communications may include any 290 or 289 courses, provided the student does not exceed the maximum for Group I, II, or III. (Min. 30 hrs., max 34 hrs. within journalism and mass communications; 90 hrs. outside journalism and mass communications.)

Agricultural Journalism Major

A specialized curriculum at the undergraduate level permits a student to earn a major in agricultural journalism by enrolling in the College of Agriculture and taking courses in the journalism department. See page 56 for details.

Home Economics and Mass Communications Major

Students may enroll in the College of Home Economics and earn a major in home economics journalism by taking courses in the journalism department. See page 273 for details.

Journalism Education

Students may satisfy requirements to teach journalism in public schools by either of the following programs: (1) B.A. or B.S. in the College of Arts and Sciences and teacher certification; (2) 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 page 216 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 department head a portfolio or tapes or other suitable evidence of performance which would allow assessment of course-related experience. After review of the material, the department head 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 Department of Journalism and Mass Communications will not honor an accumulation of credits in journalism and mass communications courses which consist of laboratory work only. The department will review the work presented by the transfer student and may accept a maximum of three credit hours for all such work, equivalent to courses such as publications practices or radio or cable television participation.

No transfer credit will be given for Reporting II, Editing I or Law of Mass Communications unless such work was taken at a college or university accredited in journalism by the American Council on Education for Journalism.

Graduate Study

Graduate students in mass communications at Kansas State University may work toward the M.S. degree in journalism or the M.A. degree in radio-tv.

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 news-editorial, magazine, public relations, advertising and radio-tv production and management.

Many graduate students structure a specialized academic program which combines journalism or radio-tv with another interest area, such as agriculture, home economics, wildlife conservation or education.

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 number of remedial hours required varies. Previous course work and professional experience are considered. Students with no previous course work or professional experience may expect to take up to nine credit hours in the journalism program or 15 credit hours in the radio-tv program.

There are two options for completing the requirements for the master's degree in journalism or in radio-tv. The Thesis Option requires a total of 30 graduate credit hours, consisting of 24 graduate course credit hours and six credit hours for the thesis. The Non-Thesis Option requires 36 hours of graduate course credits and written comprehensive examinations. Both options require a final oral examination.

The thesis option is primarily for students with a research interest or for students who enter the program after a number of years of professional experience. The non-thesis option is recommended for the student whose primary interest is professional practice or who does not have an undergraduate major in journalism or radio-tv.

Additional details are included in the department's "Guide to Graduate Study," available in the department office.

Courses in Journalism

Undergraduate Credit

289 235. Survey of the Mass Media. (3). Historical, social, legal and economic aspects of mass communications; current practices and responsibilities; role of newspapers, magazines, radio, television, motion pictures and other mass media in society, and their impact on world affairs. Not available for credit to junior and senior journalism majors. 289-235-0-0601

289 250. Agricultural Journalism. (3). Agricultural information techniques and methods of working with the mass media. Emphasis on writing experience. Ability to type helpful. Pr.: Engl. 100. For non-majors only. 289-250-1-0602

289 275. Reporting I. (3). Instruction in news gathering and reporting techniques. Pr.: Sophomore standing; ability to type 30 words a minute. 289-275-1-0602

289 285. Reporting II (Print). (3). Three hours rec. and six hours reporting for the **Kansas State Collegian** each week. Pr.: JMC 275. 289-285-1-0602

289 310. Photography I. (1-3). Basic camera and laboratory techniques of photography. 289-310-1-0602

289 320. Principles of Advertising. (3). An examination of the advertising field and its relationship to marketing and journalism. 289-320-0-0602

289 330. Editing I. (3). 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.: Consent of instructor or JMC 285. 289-330-1-0602

289 335. Editing II. (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 330 or consent of instructor. 289-335-1-0602

289 355. Advertising Media. (3). The selecting, scheduling, selling and buying of the various advertising media. Pr.: JMC 320. 289-355-0-0602

289 360. 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. 289-360-2-0602

289 399. Honors Seminar in Mass Communications. (1-3) II 1978. Pr.: Honors students only; consent of supervising instructor. 289-399-0-0601

289 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 289-499-4-0601.

Undergraduate And Graduate Credit In Minor Field

289 510. Yearbook Editing and Management. (2). Planning, editing, layout, writing and financing a publication. 289-510-1-0602

289 525. Journalism of Modern Living. (3). Study of contemporary trends in community and family life reporting, emphasizing feature writing and creative editing. Pr.: JMC 275 or consent of instructor. 289-525-1-0602

289 535. Photojournalism. (3). II. The materials, principles and processes of photography directed toward visual reporting in newspapers, magazines and other media. The 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 310. 289-535-1-0602

289 555. 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. 289-555-1-0602

Undergraduate And Graduate Credit

289 600. Public Affairs Reporting. (3). Investigative reporting of local, state and national affairs. Pr.: JMC 285 or consent of instructor. 289-600-0-0602

289 605. 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. 289-605-0-0602

289 610. Interpretation of Contemporary Affairs. (3). Critical questions of the day; interpretive articles and editorials which document and analyze the news; introduction to research methods in depth reporting. Pr.: JMC 285 or consent of instructor. 289-610-0-0602

289 615. Magazine Article Writing. (3). Preparation of feature stories and articles; techniques of marketing, market analysis and publishing articles written in course. Pr.: JMC 285 or consent of instructor. 289-615-0-0602

289 620. Magazine Production. (3). The practical application of theory on the fields of writing, editing, graphic reproduction, layout and management of magazines. Pr.: JMC 330 or consent of instructor. 289-620-0-0602

289 625. Formation of Public Opinion. (3). Role of interpersonal and mass communications information on public opinion. Practical survey experience. Pr.: Junior standing and consent of instructor. 289-625-0-0602

289 630. Public Relations. (3). Media, methods, principles, and practices of public relations. Pr.: Junior standing or consent of instructor. 289-630-0-0602

289 635. Public Information Methods. (3). Application of the principles of public relations to actual and hypothetical cases. Emphasis on communications techniques used in public relations. Pr.: JMC 630; consent of instructor. 289-635-0-0602

289 640. Public Relations and Advertising Campaigns. (3). The in-depth handling of an organization's public relations and advertising, including analyzing its situation, planning a program and developing the communications to be used. Pr.: JMC 320 or 630; senior standing; consent of instructor. 289-640-0-0602

289 645. The Black Press in America. (3). Consideration of the growth, development and current status of the Black press in the United States. 289-645-0-0602

289 650. Newspaper Management. (3). Relations of departments of a newspaper to one another; costs, statistics, advertising, news and business methods in publishing. Pr.: 289-330. 289-650-0-0602

289 660. 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 the social, economic and political forces. Pr.: Junior standing or consent of instructor. 289-660-0-0602

289 665. Law of Mass Communications. (3). A study of the legal system as it relates to the law of mass communications. Emphasis on defamation, privacy, copyright, obscenity, the courts and other areas, as related to the mass media. Pr.: Senior standing or consent of instructor. 289-665-0-0601

289 670. International Communications. (3). Comparative study of world press systems and the role of communications in national development. 289-670-0-0601

289 680. Readings in Mass Communications. (1-3). Investigation of the literature of mass communications. Pr.: Minimum of nine hours of completed course work in JMC, senior or graduate standing and consent of supervisory instructor. 289-680-3-0602

289 685. 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. 289-685-0-0602

289 690. Problems in Mass Communications. (1-4). Pr.: Background of courses needed for problem undertaken. 289-690-3-0602

289 720. Seminar in the New Journalism. (3). An examination of contemporary developments in reportage with emphasis on new journalism practitioners and media outlets. Restricted to seniors and graduate students. 289-720-0-0602

289 730. 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. Restricted to seniors and graduate students. 289-730-0-0601

289 740. Colloquium in Mass Communications. (1-3). Discussion of selected topics in mass communications research and practice. Restricted to seniors and graduate students. 289-740-0-0601

289 750. Mental Health Information Seminar I. (3). Survey of public attitudes toward mental illness and mass media's role in reporting. Pr.: For Fellows in Mental Health Mass Communications Program or consent of instructor. 289-750-0-0602

289 755. Mental Health Information Seminar II. (3). Examines specific issues in the mental health field (alcoholism, drug abuse, mental retardation, etc.) as they relate to the journalist in mental health communications. Pr.: For Fellows in Mental Health Mass Communications Program or consent of instructor. 289-755-0-0602

289 760. Behavioral Science Reporting. (3). Reporting and writing on problems of human behavior. Pr.: For Fellows in Mental Health Mass Communications Program or consent of instructor. 289-760-0-0602

289 765. Communication Theory. (3). An examination of major communication theories as they relate to individual, interpersonal, group and mass communications. 289-765-0-0601

289 770. 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 285 or R-TV 330 and consent of supervising instructor. 289-770-2-0602

289 780. Research Methods in Mass Communications. (3). Survey of research methods used in the study of the mass media. 289-780-0-0602

Graduate Credit

289 899. Research in Mass Communications. (Var.) Pr.: Registration in the Graduate School and sufficient training to carry on the line of research undertaken. 289-899-4-0602

Courses in Radio and Television

Undergraduate Credit

290 240. Fundamentals of Radio-Television Production. (3). Basic training in radio and television production and the economic and social impact of the radio-television industry. Two hours lec. and two hours lab. per week. Required of all students with R-TV concentration. 290-240-1-0603

290 250. Fundamentals of Radio-Television Performance. (3). Basic training in non-dramatic radio and television performance. Includes study for FCC 3rd Class radiotelephone permit. Two hours lec. and two hours lab. per week. Required of all students with R-TV concentration. 290-250-1-0603

290 260. Radio-Television Continuity. (3). Study of forms and the preparation of non-dramatic scripts for various types of broadcast programs. Required of all students with R-TV concentration. Pr.: R-TV 240. 290-260-0-0603

290 330. Reporting II (Radio-Television). (3). Practical experience in gathering, writing, editing and presenting news for KSDB-FM and cable television, and study of current issues in radio-television news. Pr.: JMC 275, R-TV 240. Required of all students with R-TV concentration. 290-330-1-0603

290 355. KSDB-FM Participation. (1). Supervised performance in the operation of the University's student FM radio station. Pr.: R-TV 240, 250 or consent of instructor. 290-355-5-0603

290 375. Cable Television Participation. (1). Supervised participation in program origination for cable television. Pr.: R-TV 240, 250 or consent of instructor. 290-375-2-0603

Undergraduate And Graduate Credit

290 610. Radio-Television Drama Writing. (3). Study of the principles and preparation of dramatized broadcast programs. Pr.: R-TV 240, 250 for JMC majors. 290-610-0-0603

290 615. Radio-Television Series Writing. (3). Development of complete scripts for series of documentary and anthology broadcast programs. Pr.: R-TV 240, 250 for JMC majors. 290-615-0-0603

290 620. Radio-Television Advertising. (3). Study of the principles and practices in broadcast advertising and development of radio-television promotion and advertising campaigns. Pr.: R-TV 240, 260 for JMC majors. 290-620-0-0603

290 630. Radio-Television Programming. (3). Study of the principles, planning and development of radio-television programs and schedules. Pr.: Junior or senior standing. 290-630-0-0603

290 640. Advanced Radio Production. (3). Theory and practice of radio remotes, automation and multi-channel recording and editing in the production of commercials, dramatic narrative and documentary programs. Pr.: R-TV 240, 260. 290-640-1-0603

290 650. Advanced Television Production. (3). Theory of computer-generated visuals, color television and specialized television recording techniques, and practice of dramatic production from the viewpoint of directors, producers and performers. Pr.: R-TV 240, and either R-TV 610, or R-TV 615 for JMC majors. 290-650-1-0603

290 660. History of Broadcasting. (3). History of the radio-television industry; its effects on American life; the economic, political and social significance of broadcasting. Pr.: Junior standing. 290-660-0-0603

290 665. Radio-Television Regulation and Responsibility. (3). A study of the major laws and legal decisions which affect broadcasting and cable. Primary attention given to the Communications Act and the Federal Communications Commission's Rules and Regulations; other laws relating to broadcasting and cable management considered. Pr.: Junior standing. 290-665-0-0603

290 675. Radio-Television Criticism. (3). Study of the principles and criteria of mass media criticism, with emphasis on those considerations unique to broadcasting. Pr.: Senior standing. 290-675-0-0603

290 685. Radio-Television Management. (3). Study of the practices and problems of broadcast station and cable facility management, with special attention to sales organization theory. Pr.: Senior standing, minimum of one hour each in R-TV 355, R-TV 375. 290-685-0-0603

290 750. Radio-Television Research. (3). Study and application of radio-television research, its literature and methodology. Pr.: Minimum of 15 hours of completed course work, or concurrent enrollment, in JMC; consent of instructor. 290-750-0-0603

MATHEMATICS

John E. Maxfield, Head of Department*

Professors Chawla,* Dixon,* Fuller,* Greechie, Hsu,* Kirmser,* Lee,* Marr,* Maxfield,* T. Parker,* Shult, Stamey,* Strecker, Stromberg,* Yee,* and Young;* Associate Professors Burckel,* Curtis,* Dressler,* Logan,* F. Miller,* Pigno,* and Sloat;* Assistant Professors Herman,* Muenzenberger,* W. Parker,* Summerhill,* Surowski and Williams.* Emeritus: Professors Babcock* and White;* Associate Professors Janes and Mossman;* Instructor Woldt.

Undergraduate Study

For credit by examination in college algebra, trigonometry and calculus, see page 152.

All mathematics majors are expected to take a course in Symbolic Logic in the philosophy department, Stat. 510 in the statistics department and Math. 220, 221, 222, and 240 or 225, 226, 250, and 251.

The Pre-Graduate Program. This degree will prepare students who intend to enter graduate school to work toward an advanced degree in either pure or applied mathematics.

(1) Major requirement of 21 hours in mathematics numbered 400 and above. The recommended courses to be included in these 21 hours are:

Math. 512, 513	Intro. to Modern Algebra I, II	6
Math. 601, 602	Elem. Topology I, II	6
Math. 703	Intro. to Linear Algebra	3
Math. 621, 622	Analysis I, II	6
		21

(2) In addition to the above at least 12 more hours numbered 600 and above are strongly recommended; Math 708, Set Theory and Math. 704, Introduction to the Theory of Groups, should be included if at all possible.

(3) The student should include Chemistry I and II and General or Engineering Physics I and II if interested in applied mathematics. The student should study at least one foreign language as a research tool for graduate work. These languages should be chosen from French, German, and Russian.

The Mathematics Education Program. This degree program is designed for students who want to become secondary school teachers and includes the requirements for the teaching certificate.

(1) Major requirement of 21 hours of courses in mathematics numbered 400 and above. The recommended courses to be included in these 21 hours are:

Math. 717	The Real Number System	3
Math. 511	Intro. to Algebraic Systems	3
or		
Math. 512	Intro. to Modern Algebra I	3
Math. 572	Modern Geometry	3
Math. 619	Found. of Analysis	3
Math. 791	Topics in Mathematics for Secondary School Teachers	3
		15

In addition, six hours of electives should be selected from:

Math. 513	Intro. to Modern Algebra II	3
Math. 570	History of Mathematics	3
Math. 612	Finite Applications of Mathematics	3

For students who expect to enter a graduate school the following courses are appropriate to their program:

Math. 601, 602	Elementary Topology I, II
Math. 621, 622	Analysis I, II
Math. 703	Intro. to Linear Algebra
Math. 704	Intro. to Theory of Groups

(2) Each student should elect at least one course in physics as a part of the general education science requirement and one course in computer programming is recommended.

(3) The professional educational requirements to be certified to teach in the state of Kansas are to be completed as a part of this degree program. These are:

(a) Make application to and be accepted as part of the teacher training curriculum. (See College of Education for requirements.)

(b)

Psych. 110	General Psychology
A&F 215, 315	Educational Psychology I, II
C&I 451	Principles of Secondary Education
C&I 476	Methods of Training in Secondary Schools
C&I 586	Teaching Participation in Secondary Schools
A&I 611	Educational Sociology
C&I 316	Introduction to Instructional Media

(c) Complete general education requirements of the College of Education.

Bachelor's Degree Program for Industry. Students desiring to enter industry upon earning a bachelor's degree in mathematics should, in the lower division years, complete the calculus sequence (Math. 221-223, 240 or Math. 225, 226, 250, 251) and acquire some proficiency in computer programming. It is also recommended that students take a course in probability and statistics (Stat. 510) and a course in vector analysis (Math. 514). In the junior year, students should take advanced calculus (Math. 553, 554). To fulfill degree requirements, in upper division years the following courses are highly recommended:

Math. 550	Introduction to Complex Analysis	3
Math. 551	Applied Matrix Theory	3
Math. 552	Orthogonal Functions and Elementary Partial Differential Equations	3
Math. 555	Numerical Analysis	3
Math. 640-641	Ordinary Differential Equations I, II	6

For additional courses, or as substitutes to the courses in this list, the student may take the following courses:

Math. 512-513	Introduction to Modern Algebra I, II	6
Math. 621-622	Analysis I, II	6
Math. 703	Intro to Linear Algebra	3
Math. 713-714	Advanced Applied Matrix Theory I, II	6
Math. 761-762	Advanced Numerical Analysis I, II	6
Math. 780	Numerical Solutions of Ordinary Differential Equations	2
Math. 781	Differentiable Manifolds I	3

It is recommended that the student also take at least six-hours upper division courses outside the mathematics department; these courses ought to be in the area, or areas, of applications in which the student is interested (e.g., engineering, physics, statistics, computer science, or others).

Graduate Study

The Department of Mathematics offers work in mathematics which may lead to a master's or a doctor's degree. Admission as a graduate student does not imply admission to candidacy for 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.

The general requirements for advanced degrees are given on page 34. Information on special requirements for an advanced degree may be obtained by writing to the Department of Mathematics.

Any course will be offered any term on the request of a sufficient number of students. Information concerning courses offered during the summer term may be obtained by writing to the department.

Courses in Mathematics

Undergraduate Credit

245 010. Intermediate Algebra. (3) I, II, S. Review of elementary algebra; topics preparatory to Math. 100. Pr.: One unit of high school algebra. 245-010-0-1701

245 100. College Algebra. (3) I, II, S. Pr.: Plane geometry and satisfactory placement test score in algebra. Students with 1 1/2 entrance units of algebra should normally be eligible for this course. 245-100-0-1701

245 101. The Metric System. (1) On 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 probelm solving. 245-101-0-1701

245 110. 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. 245-110-0-1701

245 120. Elementary Cryptanalysis. (3). An introduction to the standard ciphers and their solutions; consideration of historically important ciphers and messages. Pr.: Math. 100. 245-120-0-1701

245 125. College Algebra and Trigonometry. (5) I, II. This course combines the material taught in Math 100 and Math 150. It is intended for students who need both courses, or who need trigonometry but are weak in algebra. Pr.: 1½ entrance units of algebra and one unit plane geometry. 245-125-0-1701

245 149. Functional Trigonometry. (2). Interim sessions only. A special functional trigonometry course emphasizing trigonometric identities. The course is intended as special preparation for calculus. Pr.: 1 1/2 units of high school algebra. 245-149-0-1701

245 150. Plane Trigonometry. (3) I, II, S. Pr.: Plane geometry and 1 1/2 units of high school algebra. 245-150-0-1701

245 210. Technical Calculus I. (3) I, II. A condensed course in analytic geometry and differential calculus with an emphasis on applications. Pr.: Math 100, 150, or two years of high school algebra and one semester of trigonometry. 245-210-0-1701

245 211. Technical Calculus II.(3) I, II. A continuation of Math 210 to include integral calculus with an emphasis on application. Pr.: Math 210. 245-211-0-1701

245 220. Analytic Geometry and Calculus I. (4) I, II, S. Analytic geometry, differential and integral calculus of polynomials. Pr.: Math. 100, 150, or two years of high school algebra and one semester of trigonometry. 245-220-0-1701

245 221. Analytic Geometry and Calculus II. (4) I, II, S. Cont. of Math. 220 to include transcendental functions. Pr.: Math. 220. 245-221-0-1701

245 222. Analytic Geometry and Calculus III. (4) I, II, S. Cont. of Math. 221 to include functions of more than one variable. Pr.: Math. 221. 245-222-0-1701

245 224. Elements of Applied Linear Analysis. (3) I, II, S. A survey of mathematical techniques useful in the solution of problems arising in engineering and scientific analysis. Pr.: Math. 221, co-requisite, Math. 222. 245-224-0-1703

245 225. Analytic Geometry and Calculus I-S. (6) I. Analytic geometry, differential and integral calculus of functions of one variable. Accelerated coverage of the material in Math. 220-222. Pr.: Consent of department. 245-225-0-1701

245 226. Analytic Geometry and Calculus II-S. (6) II. Continuation of Math. 225 to include transcendental functions. Pr.: Math. 225. 245-226-0-1701

245 240. Series and Differential Equations. (4) I, II, S. Convergence of series, expansions in series, solutions of elementary differential equations, with applications. Pr.: Math. 222. 245-240-0-1701

245 250. Linear Algebra and Differential Equations I. (3) I. An integrated introduction to linear algebra and differential equations. Pr.: Math. 226 or consent of department. 245-250-0-1701

245 251. Linear Algebra and Differential Equations II. (3) II. Continuation of Math. 250. Pr.: Math. 250 or consent of department. 245-251-0-1701

245 398. Sophomore Seminar. (3) II 1979. Seminar in mathematics for honors students. Pr.: Membership in honors program. 245-398-3-4900.

245 399. Seminar in Mathematics. (Var.) On sufficient demand. Primarily for Honors Students. Pr.: Consent of instructor. 245-399-3-1701

245 498. Senior Honors Thesis.(2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program.

245 499. 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. 245-499-3-1701

Undergraduate And Graduate Credit In Minor Field

245 500. Introduction to Analytic Processes. (3) I, II, S. Some topics in differentiation, integration, linear algebra, matrices and linear programming, with applications. Pr.: Two years high school or college algebra, elements of statistics. Not open to students having credit in Math. 220. 245-500-0-1701

245 501. Introduction to Mathematics in the Behavioral Sciences. (3) I, II. Introduction of matrices, relations, sets and groups with applications to the behavioral sciences. Pr.: Student must be a major in anthropology, economics, history, political science, psychology, or sociology; or have the consent of the instructor. 245-501-0-1701

245 505. Mathematical Foundations for Economics. (3) II. Geometric and algebraic theory behind the simplex method, the mathematical structure of the theory of networks and flows, and related topics. Pr.: Math. 500 or 501 or its equivalent. 245-505-0-1701

245 506. Advanced Analytic Processes. (3) I, II. Partial differentiation and maximum-minimum of functions of two variables with applications. Integration, matrices and matrix algebra with business application. Not open to students having credit in Math. 221. Pr.: Math. 500. 245-506-0-1701

245 508. 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. 245-508-0-0833

245 509. Intuitive Geometry. (2) S. Measurement, triangles, quadrilaterals, nonmetric geometry, similarity, volumes, elementary coordinate geometry. Pr.: Consent of instructor. 245-509-0-1701

245 511. 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 or 226. 245-511-0-1701

245 512. Introduction to Modern Algebra I. (3) I, II. Basic concepts in the theory of numbers, groups, rings, integral domains, and fields. Pr.: Math. 220 and 225 or graduate standing. 245-512-0-1701

245 513. Introduction to Modern Algebra II. (3) II. Cont. of Math. 512. Pr.: Math. 512. 245-513-0-1701

245 514. Vector Analysis. (3). A standard introduction to vector algebra and calculus in two and three dimensions. Dot and cross products, differentiation of vector functions, the operators div, grad and curl, line and surface integrals and the theorems of Green, Gauss and Stokes. Applications to physics and other sciences will be included. Pr.: Math. 222 or consent of instructor. 245-514-0-1703

245 550. 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 or 250. 245-550-0-1703

245 551. Applied Matrix Theory. (3) I, II. Matrix algebra, systems of linear equations, vector spaces and functions on vector spaces, approximation techniques for the eigenvalue problem and matrix inversion. Pr.: Junior standing. 245-551-0-1703

245 552. Orthogonal Functions and Elementary Partial Differential Equations. (3) I. Orthogonal functions, Fourier Series, boundary value problems in partial differential equations. Pr.: Math. 240 or 250. 245-552-0-1703

245 553. Advanced Calculus I. (3) I. Continuous functions, law of mean, functions of several variables, Riemann-Stieltjes integral, infinite series, uniform convergence, Fourier Series and integrals and applications. Pr.: Math. 222 or 226. 245-553-0-1701

245 554. Advanced Calculus II. (3) II. Continuation of Advanced Calculus I. Pr.: Math. 553. 245-554-0-1701

245 555. Numerical Analysis. (3) I, II. Solution of algebraic and transcendental equations, with emphasis on linear algebraic systems. Introduction to linear programming. Interpolation and curve fitting. Numerical differentiation and integration with an introduction to methods for solving ordinary differential equations. Pr.: Math. 240 or 250, 551. 245-555-0-1701

245 570. History of Mathematics. (3) II in alt. years. Cannot be used as part of the advanced mathematics needed by mathematics majors. Pr.: Math. 220 or 225. 245-570-0-1701

245 572. Modern Geometry. (3). Concepts of Euclidean geometry including distance and congruence, separation, geometric inequalities, congruence with distance, similarity, area, consistency of Euclidean geometry; brief treatment of Lebenevskian and Riemannian geometries. Pr.: Math. 221 or 226. 245-572-0-1701

245 575. Advanced Analytic Geometry. (3). On sufficient demand. Properties of conic sections; poles and polars; selected topics in Solid Analytic Geometry. Pr.: Math. 240 or 250. 245-575-0-1701

245 601. Elementary Topology I. (3) I. Introduction to axiomatic topology including a study of compactness, connectedness, local properties, cardinal invariants and metrizability. Pr.: Math. 240 or 250. 245-601-0-1701

245 602. Elementary Topology II. (3) II. Cont. of Math. 601. Pr.: Math. 601. 245-602-0-1701

Undergraduate And Graduate Credit

245 612. Finite Applications of Mathematics. (3) S. Consideration of applications of set theory, matrix algebra, linear programming and graph theory that can be illustrated in the secondary school classroom. 245-612-0-1701

245 619. 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 or 226. 245-619-0-1701

245 620. Intermediate Analysis. (3). A brief review of some of the properties of the real number system, limits of functions of a single real variable, theorems on continuity, Rolle's Theorem, mean value theorem with some of its consequences, and theorem on integration. Pr.: Math. 222 or 226. 245-620-0-1701

245 621. Analysis I. (3) I, II, S. Metric spaces, limits, continuity, differentiation, mean value theorems, Riemann-Stieltjes integral, series. Pr.: Math. 240 or 250 or graduate standing. 245-621-0-1701

245 622. Analysis II. (3) I, II. Function spaces, Stone-Weierstrass Theorem, Ascoli Theorem, series, introduction to Lebesgue measure. Pr.: Math. 621. 245-622-0-1701

245 640. Ordinary Differential Equations I. (3) On sufficient demand. First-order equations, second-order linear equations, autonomous systems, stability, Liapunov's method, Fuchsian equations, Sturm-Liouville equations and expansions in eigenfunctions, Green's Functions, Floquet theory, non-linear equations, perturbation techniques, the WKB and Langer asymptotic theory. Pr.: Math. 240, 550. 245-640-0-1703

245 641. Ordinary Differential Equations II. (3) On sufficient demand. Continuation of Math. 640. Pr.: Math. 640. 245-641-0-1703

245 671. Projective Geometry. (3) I. Affine spaces, Euclidean spaces, projective spaces, coordinizations, duality principle, geometric lattices, classifications, subgeometries of projective geometry (especially non-Euclidean geometries). Pr.: Math. 513. 245-671-0-1701

245 701. Set Theory and Logic. (2-3). Basic set theory, cardinal and ordinal numbers, axiom of choice, transfinite induction, symbolic logic, tautologies, universal and existential quantifiers, propositional and predicate calculus, arguments, deductive systems. Pr.: Math. 511 or consent of department. 245-701-0-1701

245 703. 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. 245-703-0-1701

245 704. Introduction to the Theory of Groups. (3) II. Introduction to abstract group theory; to include permutation groups, homeomorphisms, direct products, Abelian groups. Jordan-Holder and Sylow theorem. Pr.: Math. 513. 245-704-0-1701

245 706. Theory of Numbers. (2-3) II in alt. years. Divisibility properties of integers, prime numbers, congruences, multiplicative functions. Pr.: Math. 221 or 226. 245-706-0-1701

245 708. Set Theory. (3) I. Set theory; functions, relations and orderings; ordinal and cardinal numbers; transfinite induction; axiom of choice. Pr.: Math. 511 or consent of department. 245-708-0-1701

245 710. Introduction to Category Theory. (3) II. Categories, duality, functors, natural transformations, functor categories, comma categories, universal arrows, products, limits, Yoneda's Lemma, Freyd's Adjoint Functor Theorem. Pr.: Consent of instructor. 245-710-0-1701

245 713. Advanced Applied Matrix Theory I. (3) II. The algebra of vecotors and matrices, functions of vectors and matrices, similarity and the eigenvalue problem, numerical methods associated with matrices and tensor algebra. Pr.: 551 or 703 or graduate standing. 245-713-0-1701

245 714. Advanced Applied Matrix Theory II. (3) II. Contuation of Math 713. Pr.: 713. 245-714-0-1701

245 717. 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 or 225. 245-717-0-1701

245 723. Analysis III. (3) II in alt. years. Calculus on normed vector spaces, functions of several real variables, inverse and implicit function theorems, basic existence theorems for differential equations, multiple integrals. Pr.: Math. 621. 245-723-0-1701

245 724. Analysis IV. (3) II in alt. years. Calculus on manifolds, differential forms, Stokes' Theorem, vector bundles, Riemannian metrics, differential operators. Pr.: Math. 723. 245-724-0-1701

245 740. 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. 622 or equivalent. 245-740-0-1701

245 750. Fourier Series. (3) On sufficient demand. Trigonometric Fourier Series, general orthogonal expansions, convergence and summability, multiple Fourier series, Fourier integrals and transforms. Pr.: Math. 621, 622. 245-750-0-1701

245 752. Tensor Analysis. (3) I every third year. Multilinear algebra, differentiable manifolds, differential forms and tensor fields, exterior differentiation, integration of forms and Stokes' theorem, Frobenius theorem, covariant differentiation, Riemannian connections. Pr.: Math. 513, 622. 245-752-0-1701

245 761. Advanced 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 552, 554. 245-761-0-1701

245 762. Advanced Numerical Analysis II. (3) II. Continuation of Math. 761. Pr.: Math. 761. 245-762-0-1701

245 766. Partial Differential Equations of Mathematical Physics I. (3) I. Derivation of the three types of linear second order partial differential equations of mathematical physics; the Cauchy-Kovalevsky theorem. The potential equation, the heat equation, and the wave equation, the hyperbolic equations and the hyperbolic systems, elliptic equations, and the parabolic equations. 245-766-0-1701

245 767. Partial Differential Equations of Mathematical Physics II. (3) II. Continuation of Math. 766. Pr.: Math. 766. 245-767-0-1701

245 771. Transformation and Vector Geometry. (3) I. Concepts of transformations and vectors and their applications to Euclidean Geometry. Pr.: Math. 572. 245-771-0-1799

245 772. 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 or 250. 245-772-0-1701

245 773. Foundations of Geometry. (3). Euclid's parallel postulate, non-Euclidean geometries, incidence, affine geometries, order congruence, continuity. Pr.: Math. 572. 245-773-0-1701

245 780. Numerical Solution of Ordinary Differential Equations. (2) I. (Concurrent with Computer Science 780). One-step and multi-step methods for initial value problems. Stability, consistency and convergence of these methods. Stiff equations and boundary value problems. Pr.: One C.S. Language Lab. and Math. 555 or C.S. 480, Math. 240 plus concurrent enrollment in C.S. 780. 245-780-0-1701

245 781. Differentiable Manifolds I. (3) I in alt. years. Differentiable structures, tangent bundles, tensor bundles, vector fields and differential equations, integral manifolds, differential forms, introduction to Lie groups. Pr.: Math. 578, Math. 772, or consent of instructor. 245-781-0-1701

245 782. Differentiable Manifolds II. (3). II in alt. years. Fibre bundles, theory or connections, linear and affine connections, Riemann manifolds, submanifolds of Riemann manifolds, complex manifolds. Pr.: Math. 781. 245-782-0-1701

245 785. Numerical Solution of Partial Differential Equations. (2) II. (Concurrent with Computer Science 785). Formulation of difference equations and treatment of boundary conditions. Discretization and round-off errors. Stability. Relaxation, alternating direction, and strongly implicit iterative methods. Variational and projection methods. Pr.: Math. 780 and C.S. 780 plus concurrent enrollment in C.S. 785. 245-785-0-1701

245 791. 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. 245-791-0-0833

Graduate Credit

245 810. Higher Algebra I. (3) I. Theory of groups, theory of rings and ideals, polynomial domains, theory of fields and their extensions. Pr.: Math. 513. 245-810-0-1701

245 811. Higher Algebra II. (3) II. Cont. of Math. 810. Pr.: Math. 810. 245-811-0-1701

245 821. Real Analysis I. (3) I. Measurability, integration theory, regular Borel measures, the Riesz representation theorem, and Lebesgue measure in Euclidean spaces. Pr.: Math. 622. 245-821-0-1701

245 822. 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. 245-822-0-1701

245 825. 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. 245-825-0-1701

245 826. Complex Analysis II. (3) II. Analytic continuation, the Picard theorem, H^p-spaces, elementary theory of Banach algebra, the theory of Fourier transforms, and the Paley-Wiener theorems. Pr.: Math. 825. 245-826-0-1701

245 852. Functional Analysis I. (3) I in alt. years. Topics to be selected from linear topological spaces, semi-normed 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. 245-852-0-1701

245 853. Functional Analysis II. (3) II in alt. years. Cont. of Functional Analysis I. May be repeated for credit. Pr.: Math. 852. 245-853-0-1701

245 871. 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. 602. 245-871-0-1701

245 872. 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. 245-872-0-1701

245 889. Combinatorial Analysis. (3) II in alt. years. Permutations, combinations, inversion formulae, generating functions, partitions, finite geometries, difference sets, and other topics. Pr.: Consent of instructor. 245-889-0-1701

245 897. 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. 245-897-2-0833

245 898. Topics in Mathematics. (Var.) I, II, S. Pr.: Background of courses needed for topic undertaken and consent of instructor. 245-898-4-1701

245 899. Thesis Topics. (Var.) I, II, S. 245-899-4-1701

245 900. Practicum in Mathematics. (3) I, II. Techniques of presentation of mathematical material at the university level. May be repeated for credit. Pr.: Consent of department. 245-900-2-1701

245 914. Lattice Theory I. (3) I in alt. 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. 245-914-0-1701

245 915. Lattice Theory II. (3) II in alt. years. Cont. of Math. 914. Pr.: Math. 914. 245-915-0-1701

245 925. Banach Algebra I. (3) I in alt. years. Basic Gelfand Theory, function algebras, numerical range, *-algebras, B*- and von Neumann algebras. Pr.: Consent of instructor. 245-925-0-1701

245 926. Banach Algebra II. (3) II in alt. years. Continuation of Math. 925. Pr.: Math. 925. 245-926-0-1701

245 971. Algebraic Topology I. (3) I. Homotopy groups, covering spaces, fibrations, homology, general cohomology theory and duality, homotopy theory. Pr.: Math. 811 and 872. 245-971-0-1701

245 972. Algebraic Topology II. (3) II. Cont. of Algebraic Topology I. Pr.: Math. 971. 245-972-0-1701

245 991. Topics in Algebra. (3) On sufficient demand. Selected topics in modern algebra. May be taken more than once for credit. Pr.: Consent of instructor. 245-991-0-1701

245 992. Topics in Analysis. (3) On sufficient demand. Selected topics in modern analysis. May be taken more than once for credit. Pr.: Consent of instructor. 245-992-0-1701

245 993. 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. 245-993-0-1701

245 994. 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. 245-994-0-1701

245 995. 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. 245-995-0-1701

245 996. 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. 244-996-0-1701

245 999. Research in Mathematics. (Var.) I, II, S. Pr.: Sufficient training to carry on the line of research undertaken and consent of instructor. 245-999-4-1701

MILITARY SCIENCE

Charley A. Carver, Head of Department

Assistant Professors Jones, J., McNeill, Newbank and Presnal; Instructors Olmstead and Vovk.

The Army Reserve Officers Training Corps (AROTC) program is open to all university students. The military science courses are credit-awarding courses and are applicable as electives to any degree program. Cadets may pursue any curriculum offered by the University.

The military science curriculum is separated into two elements: (1) a basic course, normally completed during freshman and sophomore years, and (2) an advanced course oriented toward junior and senior years. Students who satisfy prerequisites and requirements of the advanced course receive commissions as second lieutenants in the U.S. Army along with their baccalaureate degrees. Texts and other materials required in ROTC courses are provided without cost.

Basic Course

The basic course consists of a series of five one-credit hour courses open to all University students. Students planning to enter the advanced program must complete four courses in this series. Non scholarship basic course students incur no obligation to the Army. The basic courses are designed to introduce the student to a variety of confidence building skills and situations that, while military oriented, will enhance the student's overall college experience.

Advanced Course

Prerequisites for admittance to the advanced course may be satisfied in a number of ways: (1) completion of the basic course or summer program, (2) attendance at a basic course summer camp prior to enrollment as a junior, (3) three or more years of junior (high school level) ROTC, or (4) prior military service. Juniors accepted into the advanced course agree to complete the curriculum and to accept an army commission concurrently with the University degree. Each advanced course cadet receives $100 per month during the school year in return for this agreement. Juniors and seniors attend three hours of recitation and one hour of leadership laboratory each week for which they receive three credit hours each semester. A six-week summer camp, with pay, is an integral part of the advanced course and normally is completed between the junior and senior years. Selected cadets are offered the option of substituting army ranger training for the regular summer camp. Parachute training is available to advanced course cadets on a voluntary basis.

Summer Camp

A six-week basic course summer camp is available as part of the two-year program. This program is designed to allow ROTC participation by community college transfer student who were unable to take basic course, and graduate degree candidates who require at least two years for post-gradute curriculum completion. Application for admittance to the two-year program should be made to the Military Science Department by sophomores early in the spring semester. Satisfactory completion of the basic course summer camp earns four hours of academic credit and meets all prerequisites for entry into the advanced course. The summer camp in itself does not incur any military obligation.

Summer Program

During the 8-week regular summer school, the Army ROTC department offers a four-credit hour Summer Program. By enrolling in this course, which contains essentially the same material as the basic course (see below) the student will meet the military science requirements for enrollment in the advanced

course. Students interested in qualifying for the advanced program through this course should contact the Department of Military Science for more details.

Discharge of Duty

Current army regulations provide that ROTC graduates may discharge their military obligation in one of two ways: (1) three years active duty, or (2) three months active duty with a balance of five years and nine months (six years total) with Army Reserve or National Guard organizations. Preferences indicated by the graduate for a particular form of service are normally respected; however, existing needs of the army will prevail in event of conflict.

Scholarships

The army provides one-, two-, three- or four-year scholarships to selected high school and college students. These scholarships provide full tuition and fees, up to $200 a year for books and required supplies, and pay the student a subsistence of $100 per school month. Four-year scholarships are available to high school seniors who apply during their fall semester. The remaining scholarships are available, on a competitive basis, to all students enrolled in ROTC. These scholarships, applied for during the spring semester, become effective the following fall.

Voluntary Organizations

The department sponsors a number of voluntary personal enrichment organizations which engage primarily in professional or community service activities. A wide range of functions includes such things as competition and trick drill teams, traffic assistance at University sporting events, varsity and ROTC rifle teams, United Way campaign support and Bloodmobile support. Students desiring additional information on these organizations are invited to contact the department.

Recommended Courses

In recognition of leadership's many facets, the department recommends but does not require students enrolled in ROTC to select from a number of University course offerings which complement the leadership program. These include: Computer Science 200; History 561, 562, 741, 743 and 745; Political Science 110; Psychology 435 and 550; Geography 100; and Business Administration 420. Scholarship cadets are required to complete History course 241 513, Battles and Leaders, as an additional elective. All non-scholarship cadets are encouraged to take this course.

Basic Course
Undergraduate Credit

249 100. Mountaineering and Introduction to Military Science 1A. (1) I, II. Basic mountaineering and introduction to Army ROTC. One hour rec. and one hour leadership lab. each week; no prerequisites. 249-100-0-1801

249 102. Basic Riflery and Army Small Arms 1B. (1) II. Basic riflery and introduction to small arms of the Army. One hour rec. and one hour leadership lab. each week. Also includes a brief introduction to the Army ROTC program. No prerequisities. 249-102-0-1801

249 103. Orienteering and Introduction to Military Science 1C. (1) II. Introduction to orienteering and land navigation. One hour rec. and one hour leadership lab. each week. Also includes a brief introduction to the Army ROTC program. No prerequisites. 249-103-0-1801

249 200. Leadership and Leaders. (1) I. Leadership theory, the leader, the group, needs and motivation. Leadership lab. One hour rec. and one hour leadership lab. each week. Pr.: Completion of M.S. I or instructor's permission. 249-200-0-1801

249 202. Map Reading and Orienteering.(1) II. Military geography, map reading and aerial photograph reading. Leadership lab. One hour rec. and one hour leadership lab. each week. Pr.: Completion of Orienteering and Introduction to Army ROTC, or instructor's permission. 249-202-0-1801

249 250. 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, meet the physical standards, and permission of the professor of military science. 249-250-0-1801

249 252. ROTC Summer Program. (4) S. Prerequisite: Sophomore standing and approval of the Professor of Millitary Science. Introduction to Army ROTC; history and mission of the Army; Mountaineering techniques, Land Navigation; Basic Marksmanship, and the Army physical fitness program. Twelve hours combined recitation and lab per week, and a one-day weekend field trip. 249-252-0-1801

Advanced Course
Undergraduate Credit

249 300. Military Science 3A. (3) I. Advanced leadership and management, methods of instruction, leadership lab. Three hours rec. and one hour leadership lab. each week. Pr.: Completion of M.S. I and M.S. II or acceptable equivalent. 249-300-0-1801

249 302. Military Science 3B. (3) II. Branches of the Army, mllitary communications, small unit tactics, preparation for summer camp, leadership lab. Three hours rec. and one hour leadership lab. each week. Pr.: Completion of M.S. I and M.S. II or acceptable equivalent. 249-302-0-1801

249 400. Military Science 4A. (3) I. Administrative/staff operations and procedures, strategic analyses, leadership lab. Three hours rec. and one hour leadership lab. each week. Pr.: Completion of M.S. III. 249-400-0-1801

249 402. Military Science 4B. (3) II. Administrative/staff operations and procedures (cont.), military law, career planning, leadership lab. Three hours rec. and one hour leadership lab. each week. Pr.: Completion of M.S. III. 249-402-0-1801

MODERN LANGUAGES

Robert L. Coon, Head of Department

Professor Coon;* Associate Professor Beeson*; Assistant Professors Alexander,* Bulmahn, Collins,* Corum,* Dehon.* R. Johnson, Kolonosky,* McGraw, Mendenhall,* C. Miller,* Ossar,* Shaw,* Smith, and Tunstall; Instructor Driss. Emeritus: Professor Moore;* Associate Professors Munro* and Pettis.*

Undergraduate Study

All courses in the department are offered to nonmajors on a credit or credit/no credit basis.

Students majoring in languages should enroll for the Bachelor of Arts degree.

Within the modern language major, French, Ger-

man, Spanish, and Linguistics 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 their chosen language, plus three literature courses above the level of 700.

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.

The attention of the student preparing for graduate school or for high school teaching is directed to the corollary courses: 681 and 780. Six hours of history in the country of the student's major language interest is desirable.

Entering students who have had previous language experience and who plan to continue language study are required to take a language placement examination at the beginning of their 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.

Graduate Study

In modern languages, the degree Master of Arts is offered in the fields of French, German, Spanish and Linguistics. General requirements for the Master of Arts degree can be found under the Graduate School section 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 on page 99.

The Department of Modern Languages co-sponsors a national literary journal, *Studies in Twentieth Century Literature.*

Programs Abroad

The Department of Modern Languages sponsors summer study programs in both Paris and Mexico City, and cooperates in German programs in Eutin and Holzkirchen. All inquiries should be addressed to the head of the department.

HONORS PROGRAM.

Undergraduate Credit

253 299. 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. 253-299-0-1101

253 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 253-499-4-1101

Courses with Readings and Lectures in English

Undergraduate Credit

253 250. 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 241 250. 253-250-0-1307

Undergraduate And Graduate Credit In Minor Field

253 501. Classical Literature in Translation. (3). Selected readings in English from the works of such major classical authors as Homer, Euripides, Vergil, Horace and Terence. 253-501-0-1110

253 502. 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. 253-502-0-1102

253 503. 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. 253-503-0-1103

253 504. Russian Literature in Translation: the 19th Century. (3). Survey of principal writers of Tsarist Russia with emphasis upon Turgenev, Dostoevsky, Tolstoy and Chekhov. 253-504-0-1106

253 505. 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. 253-505-0-1105

253 506. French Women Writers. (3) II. A study of the works of the most prominent French women writers from the medieval period to the present, with particular attention to such authors as Marie de Frances, Madame de Lafayette, George Sand, Colette, and Simone de Beauvoir. Pr.: Sophomore standing. 253-506-0-1102

253 507. European Literature in Translation. (3). Selected readings in English from the major authors of Europe and the Spanish-speaking world. 253-507-0-1505

253 508. Russian Literature in Translation: the Soviet Period. (3). The development of Russian literature since the Revolution, with emphasis upon Mayakovsky, Sholokhov, Pasternak and Solzhenitsyn. 253-508-0-1106

253 509. Religious Literature of South Asia. (3). Readings in translation from ancient and medieval Hindu, Buddhist, Jaina and other religious texts. 253-509-0-1113

253 516. 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. 253-516-0-1102

FRENCH

Undergraduate Credit

253 001. Orientation for Summer School Program in Paris. (0). 253-001-0-1102

253 101. French for Reading Knowledge I. (3). The grammar and syntax of French and the reading of basic material from French texts in the humanities, sciences and social sciences. Not a prerequisite for Mod. L. 112. 253-101-0-1102

253 102. French for Reading Knowledge II. Continued reading of selected French texts. Not considered as prerequisite for Mod. L. 211. Pr.: Mod. L. 101 or equiv. 253-102-0-1102

253 109. French IL. (1). Language laboratory. Strongly recommended for students taking French I. Concurrent enrollment in French I required. For credit/no credit only. 253-109-0-1102

253 110. French IIL. (1). Language laboratory. Strongly recommended for students taking French II. Concurrent enrollment in French II required. For credit/no credit only. 253-110-0-1102

253 111. French I. (4). Introduction to the structure of modern French, emphasizing the spoken language with practice in the language laboratory. 253-111-0-1102

253 112. French II. (4). Continuation of French I, completion of basic presentation of the structure of French. Emphasis on spoken language, use of language laboratory. Pr.: Mod. L. 111 or equiv. 253-112-0-1102

253 113. Intensive French I, II. (8). A concentrated study designed to provide the student with a basic working knowledge of French grammar and conversation in a single semester. Equivalent to French I and II. Pr.: Open to all students with consent of the instructor. 253-113-0-1102

253 211. French III. (4). Intensive review of the structure of the French language. Reading and discussion of French prose. Pr.: Mod. L. 112 or equiv. 253-211-0-1102

253 212. Elementary French Conversation IIIA. (2). Course not open to fluent speakers of French. Normally to be taken concurrently with French III. Pr.: Mod. L. 112 or equiv. 253-212-0-1102

253 213. French IV. (3). Reading and discussion of modern French prose and review of the more difficult points of French grammar. Pr.: Mod. L. 211 or equiv. 253-213-0-1102

253 214. French Conversation IVA. (2). Continued practice in conversational French. Not open to fluent speakers of French. Normally to be taken concurrently with French IV. Pr.: Mod. L. 211 or equiv. 253-214-0-1102

Undergraduate And Graduate Credit In Minor Field

253 511. Survey of French Literature I. (3). The reading and discussion of French literature from the Middle Ages to the end of the eighteenth century. Pr.: Mod. L. 213 or equiv. 253-511-0-1102

253 512. Survey of French Literature II. (3). The reading and discussion of French literature from the early nineteenth century to the present. Pr.: Mod. L. 213 or equiv. 253-512-0-1102

253 513. French Composition and Conversation. (3). Review in depth of the structure of the language. Intensive practice in written and conversational French. Pr.: Mod. L. 213 or equiv. 253-513-0-1102

253 514. 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. 253-514-0-1102

253 515. Literary Analysis in French. (3). Introduction to methods of literary analysis by study in depth of chosen texts as representative of French literature. Pr.: Mod. L. 213 or equiv. 253-515-0-1102

253 517. Commercial French. (1). I. Designed for students wishing to learn French for business purposes. Emphasis on letter-writing and French business forms. Pr.: Mod. Lang. 213. 253-517-0-1102

253 518. Advanced French Conversation. (1) II. Practice in spoken French, with emphasis on idiomatic expression. May be repeated twice for credit. Pr.: 253-513. 253-518-0-1102

253 519. Special Studies in French. (Var.) Pr.: Consent of department head and instructor involved. 253-519-3-1102

Undergraduate And Graduate Credit

253 710. 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. 253-710-0-1102

253 711. Seventeenth-Century French Literature I. (3). The literature of the Baroque period. Pr.: 21 hours of college French or equiv. 253-711-0-1102

253 712. Seventeenth-Century French Literature II. (3). The literature of French Classicism. Pr.: 21 hours of college French or equiv. 253-712-0-1102

253 713. Eighteenth-Century French Literature. (3). Critical study of the literature of the Enlightenment. Pr.: 21 hours of college French or equiv. 253-713-0-1102

253 714. Nineteenth-Century French Literature I. (3). A study of Pre-romanticism and Romanticism. Pr.: 21 hours of college French or equiv. 253-714-0-1102

253 715. Nineteenth-Century French Literature II. (3). A study of Realism, Naturalism and Symbolism. Pr.: 21 hours of college French or equiv. 253-715-0-1102

253 716. Twentieth-Century French Drama. (3). Reading and analysis of the contemporary French theater from Cocteau through the Existentialist and Absurdist playwrights. Pr.: 21 hours of college French or equiv. 253-716-0-1102

253 717. Twentieth-Century French Prose and Poetry. (3). Readings in non-dramatic literature of the contemporary period. Pr.: 21 hours of college French or equiv. 253-717-0-1102

253 718. The French Novel. (3). The development of the novel from the 17th century to the present, seen through selected masterworks. Pr.: 21 hours of college French. 253-718-0-1102

253 719. 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. 253-719-0-1102

253 720. Seminar in French. (3) A seminar with variable topics. Pr.: Senior standing or consent of the instructor. 253-720-0-1102

253 799. Problems in Modern Languages. (Var.) 253-799-3-1101

Graduate Credit

253 800. 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. 253-800-0-1101

253 899. Research in Modern Languages. (Var.) Pr.: 30 hours in one modern language or equiv. 253-899-4-1101

GERMAN

Undergraduate Credit

253 002. Orientation for Summer School Program in Germany. (0). 253-002-0-1103

253 103. German for Reading Knowledge I. (3). The grammar and syntax of German and the reading of basic material selected from modern German texts. Not considered as a prerequisite for Mod. L. 122. 253-103-0-1103

253 104. German for Reading Knowledge II. (3). Continued reading of material from modern German texts. Not considered as a prerequisite for Mod. L. 221. Pr.: Mod. L. 103 or equiv. 253-104-0-1103

253 119. German IL. (1). Language laboratory. Strongly recommended for students taking German I. Concurrent enrollment in German I required. For credit/no credit only. 253-119-0-1103

253 120. German IIL. (1). Language laboratory. Strongly recommended for students taking German II. Concurrent enrollment in German II required. For credit/no credit only. 253-120-0-1103

253 121. German I. (4). Introduction to the structure of modern German. Practice of the spoken language with additional experience in the language laboratory. 253-121-0-1103

253 122. German II. (4). Continuation and conclusion of the introduction to modern German, reading of selected prose texts. Pr.: Mod. L. 121 or equiv. 253-122-0-1103

253 123. Intensive German I, II. (8). A concentrated study designed to provide the student with a basic working knowledge of German grammar and conversation in a single semester. Equivalent of German I and II. Pr.: Open to all students with consent of the instructor. 253-123-0-1103

253 221. German III. (4). Reading and discussion of a selection of modern German prose and review of the structure of German. Pr.: Mod. L. 122 or equiv. 253-221-0-1103

253 222. Elementary German Conversation IIIA. (2). Practice in beginning conversational German. Course not open to fluent speakers of German. Course normally taken concurrently with German III. Pr.: Mod. L. 122 or equiv. 253-222-0-1103

253 223. German IV. (3). Reading and discussion of modern German prose and review of the more difficult points of German grammar. Pr.: Mod. L. 221 or equiv. 253-223-0-1103

253 224. German Conversation IVA. (2). Continued practice in conversational German. Course not open to fluent speakers of German. Normally taken concurrently with German IV. Pr.: Mod. L. 221 or equiv. 253-224-0-1103

253 225. Intensive German III, IV. (7). A concentrated study allowing the student to do the work of the second year of German in a single semester. Reading and discussion of selections of modern German prose, review of German grammar, and extensive spoken practice. Pr.: Mod. Lang. 122 or 123 or equivalent competence. 253-225-0-1103

Undergraduate And Graduate Credit In Minor Field

253 521. 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.: Mod. L. 223 or equiv. 253-521-0-1103

253 522. Introduction to German Literature II. (3). Discussion of signficant works of twentieth-century prose, poetry, and drama. Special emphasis is placed on the literature of recent decades. Pr.: Mod. L. 223 or equiv. 253-522-0-1103

253 523. German Composition. (3). A study of German syntax and exercises in composition. Pr.: Mod. L. 223 or equiv. 253-523-0-1103

253 529. Special Studies in German. (Var.) Pr.: Consent of department head and instructor involved. 253-529-3-1103

253 530. 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. 253-530-0-1103

Undergraduate And Graduate Credit

253 721. 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. 253-721-0-1103

253 722. 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. 253-722-0-1103

253 723. Goethe and Faust. (3) I. The writings of Goethe and his masterpiece, Faust. Pr.: 21 hours of college German or equiv. 253-723-0-1103

253 724. 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. 253-724-0-1103

253 725. Early Twentieth-Century German Literature. (3) II. A study of the drama and lyric of Naturalism, Neo-Classicism, Neo-Romanticism, and Expressionism. Pr.: 21 hours of college German. 253-725-0-1103

253 726. German Literature since 1945. (3) I.A discussion of the post-war writings of the Gruppe 47, Swiss playwrights and others. Pr.: 21 hours of college German. 253-726-0-1103

253 727. 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. 253-727-0-1103

253 728. 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. 253-728-0-1103

253 729. 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. 253-729-0-1103

253 731. 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. 253-731-0-1103

253 732. 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. 253-732-0-1103

253 733. 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. 253-733-0-1103

253 799. Problems in Modern Langugages. (Var.) 253-799-3-1101

Graduate Credit

253 800. 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. 253-800-0-1101

253 899. Research in Modern Languages. (Var.) Pr.: 30 hours in one modern language or equiv. 253-899-4-1101

GREEK

Undergraduate Credit

253 143. Greek I. (4). Introduction to the grammar of classical Greek and reading of elementary prose. 253-143-0-1110

253 144. Greek II. (4). Completion of the grammar of classical Greek and continuation of the reading of elementary prose. Pr.: Mod. L. 143. 253-144-0-1110

253 799. Problems in Modern Languages. (Var.) 253-799-3-1101

ITALIAN

Undergraduate Credit

253 131. Italian I. (4). Introduction to the structure of modern Italian. 253-131-0-1104

253 132. Italian II. (4). Continuation and completion of the study of modern Italian grammar, using the facilities of the language laboratory for audiolingual practice. Pr.: Mod. L. 131 or equiv. 253-132-0-1104

253 231. Italian III. (4). Grammar review and reading selections from Italian literature. Pr.: Mod. L. 132 or equiv. 253-231-0-1104

253 232. Italian IV. (3). Selective review of grammar and reading of examples of modern Italian literature. Pr.: Mod. L. 231 or equiv. 253-232-0-1104

LATIN

Undergraduate Credit

253 141. Latin I. (4). An introductory study of the structure of Latin. 253-141-0-1109

253 142. Latin II. (4). Continuation and completion of the study of the structure of Latin. Pr.: Mod. L. 141. 253-142-0-1109

253 241. Latin III. (4). Review of Latin grammar and reading of an anthology of Roman prose and poetry. Pr.: Mod. L. 142. 253-241-0-1109

253 242. Latin IV. (3). Continuation of the study of Latin syntax and grammar, based upon the reading of Roman prose and poetry. Pr.: Mod. L. 241. 253-242-0-1109

Undergraduate And Graduate Credit In Minor Field

253 541. Vergil. (3). A study of the Latin epic as exemplified by Vergil's poetry. Pr.: Mod. L. 242. 253-541-0-1109

253 542. Cicero. (3). A study of the versatility of Cicero as evidenced in various works. Pr.: Mod. L. 242. 253-542-0-1109

253 543. Horace. (3). A critical study of the major works of Horace. Pr.: Mod. L. 242. 253-543-0-1109

253 549. Special Studies in Latin. (Var.) Pr.: Consent of the department head and instructor involved. 253-549-3-1109

LINGUISTICS

Undergraduate And Graduate Credit In Minor Field

253 510. 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 of signification. Pr.: Junior standing. 253-510-0-1505

253 681. General Phonetics. (3). Same as Speech 681 and Engl. 681. 253-681-1-1505

Undergraduate And Graduate Credit

253 780. Introduction to Linguistics. (3). Same as Speech 780 and Engl. 780. 253-780-0-1505

253 781. Introduction to Historical Linguistics. (3). Same as Speech 781 and Engl. 781. 253-781-0-1505

253 782. Language Typology. (3). Same as Speech 782 and Engl. 782. 253-782-0-1505

253 783. Phonology I. (3). Same as Speech 783 and Engl. 783. 253-783-0-1505

253 784. Phonology II. (3). Same as Speech 784 and Engl. 784. 253-784-0-1505

253 785. Syntax I. (3). Same as Speech 785 and Engl. 785. 253-785-0-1505

253 786. Syntax II. (3). Same as Speech 786 and Engl. 786. 253-786-0-1505

253 787. Advanced Syntax. (3). II. Same as Speech 787 and Engl. 787. 253-787-0-1505

253 788. Advanced Phonology. (3). Same as Speech 788 and Engl. 788. 253-788-0-1505

253 789. Topics in Linguistics. (3). Same as Speech 789 and Engl. 789. 253-789-0-1505

253 791. Methods and Techniques of Learning a Second Language. (3). Same as Speech 791. 253-791-0-1505

253 792. Field Methods in Linguistics. (3). Same as Speech 792 and Soc. and Anthro. 792. 253-792-0-1505

PORTUGUESE

Undergraduate And Graduate Credit In Minor Field

253 163. Portuguese I. (4). I. Introduction to the structure of the Portuguese language, stressing Brazilian usage, and emphasizing oral and written skills. 253-163-0-1199.

253 164. Portuguese II. (4). II. Continuation of Portuguese I, completion of the basic presentation of structural and linguistic principles of the Portuguese language. Pr.: Mod. Lang. 163 or equivalent course. 253-164-0-1199

253 265. 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.: Mod. Lang. 164 or equiv. 253-265-0-1199

253 266. Portuguese IV. (3). II. Reading and discussion of selections from contemporary prose, emphasizing Brazilian writings, and review of grammatical structures as needed. Pr.: Mod. Lang. 253-265 or equiv. 253-266-0-1199

253 570. Special Studies in Portuguese. (1-3). Pr.: 15 hours of Portuguese and consent of instructor. 253-570-0-1199

RUSSIAN

Undergraduate Credit

253 149. Russian IL. (1). Language laboratory. Strongly recommended for students taking Russian I. Concurrent enrollment in Russian I required. For credit/no credit only. 253-149-0-1106

253 150. Russian IIL. (1). Language laboratory. Strongly recommended for students taking Russian II. Concurrent enrollment in Russian II required. For credit/no credit only.253-150-0-1106

253 151. 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. 253-151-0-1106

253 152. Russian II. (4) II. Continuation of the study of Russian grammar and oral communication. Pr.: Mod. L. 151 or equiv. 253-152-0-1106

253 251. Russian III. (4) I. Completion of the study of Russian grammar. Reading of selected prose on the intermediate level. Pr.: Mod. L. 152 or equiv. 253-251-0-1106

253 252. Russian IV. (3) II. Intensive review of Russian grammar. Exercises in reading selected modern Russian texts in the original. Pr.: Mod. L. 251 or equiv. 253-252-0-1106

Undergraduate And Graduate Credit In Minor Field

253 551. Russian V. (3). Reading of Russian short stories of the nineteenth and twentieth centuries, including works by Pushkin, Lermontov, Dostoevsky and Chekhov. 253-551-0-1106

253 552. 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. 253-552-0-1106

253 553. Russian Conversation and Composition. (3). Discussion in Russian. Extensive practice in writing Russian compositions. 253-553-0-1106

253 559. Special Studies in Russian. (Var.) Pr.: Consent of department head and instructor involved. 253-559-3-1106

SPANISH

Undergraduate Credit

253 003. Orientation for Summer School Abroad Program in Mexico City. (0). 253-003-0-1105

253 159. Spanish IL. (1). Language laboratory. Strongly recommended for students taking Spanish I. Concurrent enrollment in Spanish I required. For credit/no credit only. 253-159-0-1105

253 160. Spanish IIL. (1). Language laboratory. Strongly recommended for students taking Spanish II. Concurrent enrollment in Spanish II required. For credit/no credit only. 253-160-0-1105

253 161. 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. 253-161-0-1105

253 162. 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.: Mod. L. 161 or equiv. 253-162-0-1105

253 261. Spanish III. (4). An intensive review of syntax and a comprehensive structural review of Spanish, with emphasis on composition and conversation. Pr.: Mod. L. 162 or equiv. 253-261-0-1105

253 262. 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 concurrently with Spanish III. 253-262-0-1105

253 263. Spanish IV. (3). Reading and discussion of selections from contemporary prose, and review of grammatical structures as needed. Pr.: Mod. L. 261 or equiv. 253-263-0-1105

253 264. Elementary Spanish Conversation IVA. (2). Continuation of Elementary Spanish Conversation IIIA. Should be taken concurrently with Spanish IV. 253-264-0-1105

253 265. Spanish for Native Speakers. (4) II. A course designed for native speakers of Spanish wishing to gain a basic command of Spanish grammar. 253-265-0-1105

Undergraduate And Graduate Credit In Minor Field

253 560. Business Spanish. (1) I. Intensive practice in Spanish business correspondence and terminology. Pr.: Two years of college Spanish or equiv. 253-560-0-1105

253 561. Spanish Literature I. (3). Introduction to the verse, prose, and drama of Spain from the Middle Ages to 1700. Pr.: 18 hours of college Spanish or equiv. 253-561-0-1105

253 562. Spanish Literature II. (3). Verse, prose, and drama of Spain from 1700 to the present. Pr.: 18 hours of college Spanish or equiv. 253-562-0-1105

253 563. Spanish-American Masterpieces. (3) I. Reading and analysis of major works in Spanish-American literature, including Dario, Borges, Asturias, Neruda, Paz, Garcia Marquez and Fuentes. Pr.: 18 hours of college Spanish or equiv. 253-563-0-1105

253 564. Spanish Composition and Grammar (3). The grammar and syntax of modern Spanish. Pr.: Two years of college Spanish or equiv. 253-564-0-1105

253 565. 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.: 18 hours of college Spanish or equiv. 253-565-0-1105

253 566. Hispanic-American Civilization. (3) II. Survey of Spanish-American culture and civilization from 1492 to the present. Pr.: 18 hours of college Spanish or equiv. 253-566-0-1105

253 567. Spanish Masterpieces. (3) I. Reading and analysis of major works in Spanish literature, including Cervantes, Lope de Vega, Galdos, Unamuno, Valle-Inclan, A. Machado, Ortega y Gasset, J.R. Jimenez and Garcia Lorca. Pr.: 18 hours of college Spanish or equiv. 253-567-0-1105

253 568. Literary Analysis in Spanish. (3). Introduction to literary analysis by study in depth of chosen texts representative of the many genres in Spanish and Spanish-American literatures. Pr.: Mod. L. 263 or equiv. 253-568-0-1105

253 569. Special Studies in Spanish. (Var.) Pr.: Consent of department head and instructor involved. 253-569-3-1105

253 570. Advanced Spanish Composition and Grammar. (2) II. Intensive study and practice in the use of complex grammatical structures. Pr.: Spanish Composition and Grammar. 253-570-0-1105

253 571. Advanced Spanish Conversation. (2) II. Intensive practice in conversation. May be repeated once (or, up to 4 hrs.). Pr.: Elementary Spanish Conversation IV A or equiv. and permission of instructor. 253-571-0-1105

Undergraduate And Graduate Credit

253 751. Spanish-American Narrative I. (3). The reading and study of selected Spanish-American novels and short stories. Pr.: 21 hours of college Spanish or equiv. 253-751-0-1105

253 752. Spanish-American Narrative II. (3). Continuation of Spanish-American Narrative I, with emphasis on contemporary fiction. Works by such writers as Borges, Asturias, Garcia Marquez, Vargas Llosa, and Arguedas will be read. Pr.: 21 hours of college Spanish or equiv. 253-752-0-1105

253 753. Spanish-American Drama, Essay, and Poetry I. (3). An in-depth reading and discussion of works in each of these three genres, to include such authors as Sarmiento, Bello, Heredia, and Sanchez. Pr.: 21 hours of college Spanish or equiv. 253-753-0-1105

253 754. Spanish-American Drama, Essay, and Poetry II. (3). A continuation of Spanish-American Drama, Essay and Poetry I, with emphasis on such contemporary authors as Paz, Dragun, Usigli, Neruda, Mistral and Dario. Pr.: 21 hours of college Spanish or equiv. 253-754-0-1105

253 755. Spanish Poetry. (3). Reading and analysis of Spanish poetry from the Medieval period to our times, with emphasis on different critical approaches to poetry. Such authors as J. Manrique, Garcilaso de la Vega, J. de la Cruz, Lope de Vega, Gongora, Quevedo, Zorrilla, Espronceda, Becquer, Garcia Lorca and J. Guillen will be studied. Pr.: 21 hours of college Spanish or equiv. 253-755-0-1105

253 756. 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. 253-756-0-1105

253 757. The Generation of 1898. (3). Reading and analysis of prose and poetry written by members of the Generation of 1898. Special attention will be given to Unamuno, Valle-Inclan, A. Machado, Azorin, and Baroja. Pr.: 21 hours of college Spanish or equiv. 253-757-0-1105

253 760. Advanced Spanish Syntax. (3). II. An intensive study of the syntax and structure of the language. Introduction to Spanish stylistics. Pr.: 21 hours of college Spanish or equiv. 253-760-0-1105

253 767. Twentieth-Century Spanish Drama. (3). Reading and analysis of such dramatists as Benavente, Garcia Lorca, Sastre and the Absurdists. Pr.: 21 hours of college Spanish or equiv. 253-767-0-1105

253 768. Post-Civil War Spanish Novel. (3). Reading and analysis of significant novels of the post-Civil War period. Pr.: 21 hours of college Spanish or equiv. 253-768-0-1105

253 771. Spanish Novel of the Golden Age. (3). Reading and analysis of Golden Age novels, including the Picaresque novel, Cervantes, and other works. Pr.: 21 hours of college Spanish or equiv. 253-771-0-1105

253 773. Spanish Drama of the Golden Age. (3). Reading and analysis of dramatists such as Lope de Vega, Tirso de Molina and Calderon de la Barca. Pr.: 21 hours of college Spanish or equiv. 253-773-0-1105

253 775. 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. 253-775-0-1105

253 779. Seminar in Spanish. (3). A seminar with variable topics. Pr.: Senior standing or consent of the instructor. 253-779-0-1105

253 799. Problems in Modern Languages. (Var.) 253-799-3-1101

Graduate Credit

253 800. 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. 253-800-0-1101

253 899. Research in Modern Languages. (Var.) Pr.: 30 hours in one modern language or equiv. 253-899-4-1101

SOUTH ASIAN LANGUAGES

Undergraduate Credit

253 171. 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 every-day spoken style. Hindi is the dominant language of northern India. Urdu is the national language of Pakistan, also understood throughout the Hindi area. 253-171-0-1113

253 172. Hindi/Urdu II. (4). II. Continuation of Hindi/Urdu I with introduction of the Devanagari (Hindi and Sanskrit) script. Pr.: Mod. L. 171. 253-172-0-1113

253 273. Hindi/Urdu III. (4). I. Continuation of Hindi/Urdu II with gradual transition to more formal styles of language. Pr.: Mod. L. 172. 253-273-0-1113

253 274. Hindi/Urdu IV. (4). II. Continuation of Hindi/Urdu III-with readings in Hindi or Urdu literature according to needs of students. Pr.: Mod. L. 273. 253-274-0-1113

Undergraduate And Graduate Credit In Minor Field

253 575. 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.: Mod. L. 274. 253-575-0-1113

253 578. Tamil I. (5). The elementary study of the principal modern Dravidian tongue. Pr.: Some knowledge of another foreign language desirable. 253-578-0-1113

253 579. Tamil II. (5). Continuation of Tamil I. Pr.: Mod. L. 578. 253-579-0-1113

253 582. Languages in South Asia. (3). Survey of South Asian languages from genetic, sociological, descriptive, and comparative points of view. Pr.: Introduction to Linguistics desirable, not necessary. 253-582-0-1113

Undergraduate And Graduate Credit

253 799. Problems in Modern Languages. (Var.) 253-799-3-1101

MUSIC

Robert A. Steinbauer, Head of Department*

Professors Brookhart,* Steinbauer,* Walker,* and White;* Associate Professors Flouer,* Jackson,* Langenkamp,* Lilley,* Semanitzky,* Shull,* Sidorfsky,* Sloop;* and R. Walker;* Assistant Professors Caine,* R. Edwards,* Hewett, Polich, Neumeyer,* Sutton* and M. Walker;* Instructors Funkhouser and Goacher; Assistant Instructors Bolan, Buster, Cox and J. Edwards; Teaching Associates Kroeker and Schwab.

Undergraduate Study

The Department of Music is a member, with institutional accreditation, of the National Association of Schools of Music.

Curricula in applied music and music education with majors in theory and composition, voice, piano, organ, strings, woodwind 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 applied music do not require prerequisites for those not majoring in music; however, availability of instructor and fees for non-majors are factors in securing applied lessons. 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 applied music as an elective.

Entrance Requirements for New and Transfer Students. Preliminary placement examinations in piano, the applied 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. 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 pre- professional requirements, and it thus may appeal to students whose professional goals go beyond music. The minimum requirement in music is 48 hours, including Music 175, 176, 214, 215, 406 and 407 (24 hours of comprehensive musicianship); at least 8 hours of applied music; and at least 8 hours of history, theory or composition. Recital attendance and participation in an organization is required each semester. The major program of music leading to the degree Bachelor of Arts may be elected in one of these three fields: music literature, music theory, or applied music.

The music literature field requires eight hours of selected electives in music history and music literature. In addition, eight semester hours in a single applied area is required, of which half must be from the 400 level.

If the field is music theory, the program calls for Music 503, 521 (three hours), 615, 616, three semester hours elected in music literature, and eight semester hours of applied piano, of which half must be from the 400 level.

If the field is applied music, the program calls for Music 615, 616 (Music Theory) plus 16 hours of an applied instrument or voice, of which half must be from the 400 level.

Participation in a music organization (instrumental or choral, depending on the major applied area) is required each semester, and the piano proficiency requirement must be passed before graduation.

The major in music in the Bachelor of Arts degree

is not intended to prepare students to teach in the public schools in Kansas.

Bachelor of Music. A four-year program in performance is offered in applied music with majors in voice, keyboard, strings, wind and percussion instruments.

The basic requirements for the program in Applied Music are these: Music 175, 176, 214, 215, 406, 407, 476, 477, 615, 616 (comprehensive musicianship and theory of music courses). Instrumental majors are required to take Music 503. Vocal majors must elect 8 additional hours in music; instrumental majors, 5 hours. Requirements in general education are stated on page 101.

In the vocal program, 28 semester hours of voice, of which half must be from the 400 level, 4 semester hours of diction, 4 semester hours of piano, piano proficiency, and 4 semester hours of vocal ensemble and/or opera workshop are required.

In the instrumental program, 32 semester hours of the major instrument, of which half must be from the 400 level, 4 semester hours of Instrumental Ensemble (Music 288), and 4 semester hours of applied minor is required. If a keyboard instrument is not the major, one must be chosen as a minor.

For the program in theory and composition, the basic courses in music for the instrumental major are required. In addition, the following courses are required: Piano (8 hours), Music 521 (12 hours), 631 and 632, (electronic music, 4 hrs.), electives (5 hours), general electives (42 hours).

A minimum of 8 hours in musical organizations is required in all the above programs. Recital Attendance (Music 050) is also required for each semester of the course.

Applied majors are required to present half recital during the junior year and a full recital during the senior year.

Bachelor of Science in Music Education. Specific music requirements are these: for instrumental and vocal options Music 175, 176, 214, 215, 406, 407, 417, 476, or 477, 503 (comprehensive musicianship courses); Music 412 and 413 (Music Education Methods). Music 417 (conducting) must be taken before student teaching, and it may be used as an elective course for the applied major.

Instrumental majors include three of the following (depending on specific major): Music 232, 233, 234, 235, (Beginning Techniques and Materials) and two of the following (depending on major) Music 427, 428, 429 (Advanced Techniques and Materials)as well as Music 514 (Music Education Methods). In addition, instrumental majors complete two hours of voice class and a minimum of two hours in piano class. (If the applied major is piano, two hours of another instrument is required.) Instrumental majors complete eight hours of a major applied instrument, of which four hours must be from the 400 level.

Vocal majors complete Music 232, 233, 234, 235 (Beginning Techniques and Materials) and Music 513 (Music Education Methods). In addition they complete four hours of Singers Diction and four hours of Applied Keyboard. (These eight hours are the minor applied.) Vocal majors complete eight hours of voice, of which four hours must from the 400 level.

Piano proficiency requirements must be passed before admission to student teaching for all music education majors. Participation in at least one musical organization in the major applied area is required during each semester until graduation. A maximum of eight semester hours for this participation is allowed toward degree requirement. Recital attendance is required each semester of the program.

Music Education majors will study in the private studio for at least seven semesters for eight hours credit. (Divisional policies may require eight semesters.) They are also required to give a half recital during the junior or senior year. Should a divisional faculty feel that the best interest of the music education student would not be served by public performance, the student may fulfill the recital requirement by giving a private performance for the divisional faculty. (The student may appeal this action.)

General Regulations for All Applied Study. Each student is required to perform at least once a semester either in a studio or on a student recital.

As a part of applied music requirements, studio and divisional seminars are held regularly (once a week) as well as a monthly general student recital. (Recital attendance policy is explained elsewhere.) Attendance at the seminars is mandatory. Unexcused absences will result in lowering the semester grade.

All private study for credit will culminate in a jury exam each term (summer included).

Each division faculty reserves and maintains the right to advise students to discontinue applied study in that particular curriculum if the students have not demonstrated the necessary degree of progress.

For specific divisional requirements, each student should request and receive a written copy of divisional detailed policies.

Required Recital Attendance. Attendance at a minimum of 15 recitals per semester is required for graduation. Concert offerings include the following: student and faculty recitals, organization concerts; and all subscription series.

Practice Rooms. Practice room privileges are included in the fees for Music majors.

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 curriculum substantially equivalent to that of this University. All entering students are required to take the advanced music test of the Graduate Record Examinations. While it is expected that the test will be taken early enough for the scores to be evaluated as part of the admission process, the applicant may, in some cases, be admitted with the understanding that the test is to be taken at the earliest opportunity.

Emphasis in the graduate program may be placed on music education, performance, theory and composition, or music history and literature. All areas of emphasis center around 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 (can be 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, Kansas State University, Manhattan, KS 66506.

Courses in Comprehensive Musicianship

Undergraduate Credit

257 100. Music Fundamentals. (3) I, II, S. Elementary instruction in the Theory of Music. 3 hours rec. a week. 257-100-0-1004

257 175. Styles I, Textures of Music. (4) I, II, S. 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. Lecture and lab. meets six hours per week. Pr.: Music 100 or tested knowledge of basic Music Theory. 257-175-1-1004

257 176. Styles II, Musical Styles of the Middle Ages and Renaissance. (4) I, II, S. An in-depth study of the early music; monody, organum and modal counterpoint. Lecture and lab. meets six hours per week. Pr.: Music 175 (Textures of Music), or consent of instructor. 257-176-1-1004

257 214. Styles III, Musical Styles of the Baroque Period. (4) I, II. The beginnings of homophony as applied to a diatonic style. Procedures of harmonic counterpoint. Lecture and lab. meets six hours per week. Pr.: Music 176 or consent of instructor. 257-214-1-1006

257 215. Styles IV, Musical Styles of the Classical Period. (4) I, II. Common procedures of the late eighteenth century. Forms, modulatory procedures, basic orchestrational skills as applied to chamber ensembles. Lecture and lab. meets six hours per week. Pr.: Music 214 or consent of instructor. 257-215-1-1006

257 390. Problems in Music. (1-3) I, II, S. Offered on demand. Pr.: Background of courses needed for problems undertaken. 257-390-4-1004

257 406. Styles V. (4). I, II, S. Musical style of the Romantic Period. Chromatic harmony and impressionistic devices. Orchestration as applied to the large ensemble. Lecture and lab. Pr.: Music 215 or consent of instructor. 257-406-1-1006

257 407. Styles VI. (4). I, II, S. Musical style of the Modern Period. Modern music; contemporary practice and aesthetics; polytonality, serial techniques, electronic music. Lecture and lab. Pr.: Music 406 or consent of instructor. 257-407-1-1006

257 417. 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 interpretataion in both choral and instrumental types of ensemble performance. Pr.: Music 406. 257-417-1-1004

257 423. Music Form and Analysis I. (2) I. Forms used in composition: the music of Bach, Haydn, Mozart, Beethoven, Schumann, Chopin, Brahms, Wagner and others. Pr.: Music (Theory) 215. 257-423-0-1004

257 424. Music Form and Analysis II. (2) II. Continuation of Music 423. Forms and compositional techniques as used by major composers of the 20th century. Pr.: Music (Theory) 423 or consent of instructor. 257-424-0-1004

257 476. Styles VII. (2-4). I, II, S. Problems in Musical Style. Individual projects relating to a specific style problem of the applied major or minor. Pr.: Music 407 or consent of instructor. 257-476-2-1004

257 477. Styles VIII. (2-4). I, II, S. Problems in Music Pedagogy. Individual projects relating to a specific pedagogical problem of the applied major or minor. Pr.: Music 476 or consent of instructor. 257-477-2-1004

257 503. Instrumentation and Orchestration. (3) II. S. Instruments of the band and orchestra studied with relation to range, function and tone color. Simple and more difficult familiar and non-familiar composition scored for ensembles, full orchestra and full band. One hour lab. each week as needed. Pr.: Music (Theory) 215. 257-503-1-1004

257 521. Composition. (Var.) I, II, S. Individual instruction in composition. Pr.: Consent of instructor. 257-521-3-1004

Undergraduate And Graduate Credit

257 615. Canon and Fugue. (2) I, S. Counterpoint in 18th century style. Pr.: Music 215, consent of instructor. 257-615-0-1004

257 616. Twentieth-Century Counterpoint. (2) II, S. Contrapuntal devices used by twentieth-century composers; serial techniques. 257-616-0-1004

257 631. 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. 257-631-0-1004

257 632. Seminar in Electronic Musical Acoustics. (2) Offered on demand. Techniques of modern experimental music; related music theory; voltage-controlled systems and computational synthesis. Individual projects. Pr.: Music 631. 275-632-3-1004

257 711. Practical Composition and Arranging. (2) Offered on demand. Explanation of styles and techniques applicable to contemporary commercial music. Practical arranging for the stage band. Pr.: Music 215 or consent of instructor. 257-711-0-1004

257 714. Advanced Orchestration. (2) Offered on demand. The study of contemporary (twentieth century) 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. 257-714-0-1004

257 736. Advanced Music Score Reading. (2) Alt. S. Score reading and preparation for the conductor, plus limited experience conducting choral and instrumental groups. Pr.: 20 hours music theory. 257-736-0-1004

257 802. Seminar in Music Theory. (3) I, alt. S. Comparison of major theoretical treatises and historical compositional practices; practical application for the modern musician. Pr.: 20 hours music theory. 257-802-0-1004

257 804. Advanced Analysis. (3) II, alt. S. An in-depth study of works by later Romantic and Modern composers: techniques and styles in relation to form. Pr.: 20 hours music theory. 257-804-0-1004

257 857. Advanced Composition. (Var.) I, II, S. Individual instruction in composition. Pr.: Music 521 and consent of instructor. 257-857-3-1004

Courses in Music History and Literature

Undergraduate Credit

257 150. 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 and faculty artists. Limited to non-music majors. 257-150-1-1005

257 243. The Symphony. (2) Offered on demand. Survey of the history of the symphony with presentations of a number of the most important symphonies. The course is designed for students majoring in curricula other than music. 257-243-0-1005

257 245. Program Music. (2) Offered on demand. The presentation of a number of programmatic compositions with non-musical sources from which they are derived. This course is designed for students majoring in curricula other than music. 257-245-0-1005

257 250. Appreciation of Music. (2) I, II, S. A study of musical materials, forms and styles that will enable the listener to enjoy more fully the music which he may hear at concerts, in broadcasts, and on records. 257-250-0-1005

257 399. Honors Seminar. (3) II. Offered on demand. Honors Seminar in Music for selected sophomores. 257-399-1-1005

257 420. History of Jazz. (3) Offered on demand. Survey of jazz styles and personalities. For music majors and non-majors. Pr.: Music 150, 250 or equivalent. 257-422-0-1005

257 421. History of Music. (3) On demand. Chronological study of significant musical trends; the influence of cultural forces upon musical developments; the contributions of individual composers. Pr.: Consent of instructor. 257-421-0-1005

257 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 257-499-1-1005

257 570. The Lyric Theater. (3) Offered on demand. The history of operetta and music comedy from Offenbach to the present. Offered jointly with Department of Music & Speech. 257-570-0-1006

257 571. The Opera. (3). Offered on demand. Survey of the history of the opera, with a review of a number of the most important operas. Course is designed for students majoring in curricula other than music. Offered jointly by the Departments of Music and Speech; same as Speech 571. 257-571-0-1006

Undergraduate And Graduate Credit

257 492. 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 the curriculum of Applied Music. Taught in divisions according to the major. Practical application through supervised studio teaching. 257-492-2-1004

257 601. Western Music before 1750. (3) I, alt. S. A survey of the development of Western music from early Greek civilization to 1750. Pr.: Music 215. 257-601-0-1006

257 602. Western Music from 1750 to the Present. (3) II, alt. S. The development of Western music from 1750 to the present. Pr.: Music 215. 257-602-0-1006

257 613. Black Music in the Americas. (3) II. Negro music of the new world viewed in a cultural-historical framework. Examination of the social conditions under which African and European music styles came into contact in the New World and the ways in which they blended to form the unique styles of calypso, blues, and jazz. Offered jointly by anthropology and music. Same as Anthro. Pr.: Anthro. 200. 613. 257-613-0-1006

257 704. 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.: Consent of instructor. 257-704-0-1006

257 705. Chamber Music Literature. (3) II, alt years. A selected survey of masterpieces of small ensemble music from 1750 to the present. Special emphasis on the string quartet. Pr.: Consent of instructor. 257-705-0-1006

257 706. Song Literature. (3) II, alt years. Survey, by historical period and national style, of major solo vocal works. Pr.: Consent of instructor. 257-706-0-1006

257 708. Choral Literature. (3) II, alt. years. A study of standard choral masterpieces in both large and small forms from 1450 to the present. Pr.: Consent of instructor. 257-708-0-1006

257 737. Organ Literature. (3) II, alt. years. A survey of significant compositions for organ from the Renaissance to the present, with emphasis on performance practice. Pr.: Consent of instructor. 257-737-0-1006

257 738. Piano Literature. (3) I, alt. years. Selective survey of music for piano from 1750 to the present. Pr.: Consent of instructor. 257-738-0-1006

Graduate Credit

257 765. Music of the Twentieth Century. (3) II. The historical aspect in musical analysis of composition since the Romantic period. Pr.: Music 407. 257-765-0-1006

257 766. 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. 257-766-0-1006

257 803. 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. 257-803-0-1006

257 828. Methods and Materials for the Studio. (2) I, II, S. Methods of teaching fundamental techniques; selection of teaching materials outlining courses of study. For graduate students in Applied Music. Taught in divisions according to the major. Practical application through supervised studio teaching. 257-828-2-1004

257 830. 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, or consent of instructor. 257-830-0-1006

257 832. 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, or consent of instructor. 257-832-0-1006

257 834. Seminar in Classical Music. (3) II. In-depth investigation of a selected area or problem in Classical music. Emphasis on individual research. Pr.: Music 602, consent of instructor. 257-834-0-1006

257 836. Seminar in Romantic Music. (3) I. In-depth investigation of a selected area or problem in Romantic music. Emphasis on individual research. Pr.: Music 602, consent of instructor. 257-836-0-1006

Courses in Music Education

Undergraduate Credit

257 405. 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. (Course open to elementary education majors only.) 257-405-0-0832

257 412. Elementary School Music. (3) II. The study of music as it contributes to child development in the elementary school. Principles of reading readiness applied to music with study of various music series. Pr.: Music major, junior standing. 257-412-0-0832

257 413. Secondary School General Music. (2) II. Objectives, organization, content, methods, materials involved in development and teaching of non-performance courses in secondary schools. Concentrated attention given to junior high school. Pr.: Music 412, or consent of instructor. 257-413-0-0832

257 489. Workshop in Music. (1-2) S. Specialized interest areas for undergraduate students only. Pr.: Consent of instructor. 257-489-2-0832

257 512. Organization of School Music. (1) I, II. Study of music education with reference criteria for evaluation of activities, methods, materials in a well-balanced program of music. Two classes weekly on the "block" during professional semester. Pr.: Music 412, 413. 257-512-2-0832

257 513. Secondary School Vocal Music. (2) I. Organization, administration, operation of vocal music programs in junior and senior high schools. Emphasis on voice-training, methods, ensemble development, techniques, selection of repertoire. 257-513-2-0832

257 514. Secondary School Instrumental Music. (2) I. Organization, administration, operation of instrumental music programs in junior and senior high schools. Emphasis on teaching music through performance, selection of literature; discussion and evaluation of marching and stage bands. 257-514-2-0832

257 709. Survey of Choral Repertory. (3) Alt. years. Repertoire of mixed, male and women's choral ensembles; techniques for effective program building. Pr.: Graduate standing or consent of instructor. 257-709-0-0832

257 731. Marching Band and Stage Band Techniques. (3) S. Show ideas and organization, music selection, rehearsal techniques, organization and administration of the marcing band and stage band. Pr.: Junior standing. 257-731-1-0832

257 770. Advanced Studies in Elementary School Music. (2-3) Offered on demand. Individual and small group studies of special problems in the teaching of music to children. Pr.: Consent of instructor. 257-772-0-0832

257 772. Advanced Studies in Secondary School General Music. (3) Offered on demand. Individual and small group studies of special problems in teaching music classes in grades 7-12. Pr.: Consent of instructor. 257-774-0-0832

257 774. Advanced Studies in Secondary School Choral Music. (2-3) Offered on demand. An intensive study of the training of choral ensembles in secondary schools, with particular emphasis on tone production, expressive singing, diction, rehearsal and performance techniques. Pr.: Consent of instructor. 257-770-0-0832

257 776. Advanced Studies in Secondary School Instrumental Music. (2-3) Offered on demand. Individual and small group studies of special problems in the training of instrumental ensembles in grades 7-12. Pr.: Consent of instructor. 257-776-0-0832

257 806. Foundations of Music Education I. (3) Offered on demand. Survey of the development of school music in the United States, and the study of basic concepts in aesthetics and curriculum theory as sources of principles in music education at all levels. Pr.: Nine hours credit in music education. 257-806-0-0832

257 807. Foundations of Music Education II. (3) Offered on demand. A study of basic concepts in the psychology of music and learning theory as sources of principles in music education, and an introduction to experimental research in music teaching. Pr.: Nine hours credit in music education. 257-807-0-0832

257 808. Analysis and Evaluation of Music Teaching and Learning. (3) Offered on demand. A study of various techniques for analyzing teacher-student interaction in the music classroom and of ways of measuring and evaluating musical achievement. Pr.: Music 806 or 807. 257-808-0-0832

257 809. Seminar in Music Education. (3) Offered on demand. A seminar with variable topics. May be repeated once for credit when topic varies. Pr.: Graduate standing and six semester hours of graduate music education courses, or consent of instructor. 257-809-0-0832

257-812. Workshop in Service Playing for the Church Organist. (1) S. The church organist in service playing including liturgy, hymn playing, accompanying, repertoire, and registration for both pipe and electronic organs. 257-812-2-0832

257 813. Workshop: Flint Hills Choral Symposium. (1) S. The study of all aspects of the choral art. 257-813-2-0832

257 814. Workshop in Music. (1-2) S. Studies in specialized interest areas. Techniques and interpretations of styles of the various periods of music. 257-814-2-0832

257 815. Workshop in Percussion Instruments. (V 1-2) S. Survey and demonstration of the methods, materials and teaching techniques of percussion instruments. 257-815-2-0832

257 816. Workshop in Woodwind Instruments. (V 1-2) S. Survey and demonstration of the methods, materials and teaching techniques of woodwind instruments. 257-816-2-0832

257 817. Workshop in Brass Instruments. (1-2) S. Survey and demonstration of the methods, materials and teaching techniques of brass instruments. 257-817-2-0832

257 818. Workshop in Stringed Instruments. (1-2) S. Survey and demonstration of the methods, materials and teaching techniques of stringed instruments. 257-818-2-0832

257 819. Workshop in Electronic Music. (1-2) S. A practical and non-technical explanation of synthesizers, synchronous tape-recorders, and audio mixing devices. Applications for the classroom. Pr.: Consent of instructor. 257-819-2-0832

257 820. Workshop in Marching Band. (1-2) S. Survey of the methods, materials and the teaching techniques of the marching band. 257-820-2-0832

257 821. Workshop in Junior High School Vocal Music. (1-2) S. Survey of the methods, materials, and the teaching techniques of vocal music for the junior high school. 257-821-2-0832

257 822. Workshop in Elementary Music. (1-2) S. Organizing old and new materials for various levels of elementary music, correlation of academic subjects with the music program. 257-822-2-0832

257 823. Workshop in Choral Music. (1-2) S. Choral techniques and interpretation of Baroque, Classical, Romantic, and Modern styles. 257-823-2-0832

257 824. Workshop in Instrumental Music. (1-2) S. Teaching techniques, methods and materials for woodwind, brass, string, and percussion sections of bands and orchestras. 257-824-2-0832

257 825. Workshop in Piano Pedagogy. (1-2) S. Methods, materials and teaching techniques for all grade levels. 257-825-2-0832

257 826. Workshop in Jazz Ensemble Techniques. (V 1-2) S. Methods, materials and improvisational techniques for teaching Jazz in the public schools. 257-826-2-0832

Courses in Performance

Undergraduate Credit

257 050. Recital Attendance. (0) I, II. 257-050-0-0000

257 055. Seminar in Applied Music. (0) I, II, S. 257-055-0-0000

257 111. Concert Choir. (1) I, II. Membership by tryout. 257-111-5-1004

257 115. Marching Band. (1) I. Marching band during fall semester; performs for athletic and University events. Admission by audition. 257-115-5-1004

257 116. Concert Band. (1) II. Open to all interested wind and percussion performers without audition. 257-116-5-1004

257 117. Symphonic Band. (1) I, II, S. A select performing organization. Admission by audition only. 257-117-5-1004

257 121. Collegiate Chorale. (1) I, II, S. 257-121-5-1004

257 125. K-State Singers. (1) I, II. Membership by tryout. (Not open to Music majors.) 257-125-5-1004

257 130. Symphony Orchestra. (1) I, II, S. Membership by audition. 257-130-5-1004

257 131. Theatre Orchestra. (1) I, II. Membership by audition. 257-131-5-1004

257 135. Men's Glee Club. (1) I, II. Membership by tryout. 257-135-5-1004

257 140. Women's Glee Club. (1) I, II. Membership by tryout. 257-140-5-1004

257 288. Instrumental Ensemble. (1) I, II, S. Elective for selected students. 257-288-5-1004

257 289. Concert Jazz Ensemble. (1) I, II, S. Elective for selected students. 257-289-5-1004

257 290. Vocal Ensemble. (1) I, II, S. Elective for selected students. 257-290-5-1004

257 291. Madrigal Singers. (1) I, II. 257-291-5-1004

257 292. Jazz Instrumental Ensemble. (1) I, II, S. 257-292-5-1004

257 293. String Ensemble. (1) I, II, S. 257-293-5-1004

257 294. Brass Ensemble. (1) I, II, S. 257-294-5-1004

257 295. Wind Ensemble. (1) I, II, S. 257-295-5-1004

257 350. Studio Accompanying. (1) Offered on demand. Piano student assigned to studio instructor. Accompanies applied lessons for at least two hours per week. Ensemble credit for pianists. Pr.: Consent of instructor. 257-350-1-1004

257 351. Recital Accompanying. (1) Offered on demand. Piano student assigned to a music major preparing for graduation recital. Pianist accompanies student in his lessons and presents the formal public program as course requirement. Pr.: Consent of instructor. 257-351-1-1004

257 400. Concert Choir. (1) I, II. Membership by audition. 257-400-5-1004

257 401. Concert Band. (1) I, II, S. Open to all interested wind and percussion performers without audition. 257-401-5-1004

257 402. Symphonic Band. (1) I, II. A select performing organization. Admission by audition only. 257-402-5-1004

257 403. Collegiate Chorale. (1) I, II, S. Open to all interested singers. Audition determines membership in other choral organizations. 257-403-5-1004

257 404. Symphony Orchestra. (1) I, II, S. Membership by audition. 257-404-5-1004

257 408. Men's Glee Club. (1) I, II. Membership by audition. 257-408-5-1004

257 409. Women's Glee Club. (1) I, II. Membership by audition. 257-409-5-1004

257 410. Concert Jazz Ensemble. (1) I, II, S. Elective for selected students. 257-410-5-1004

257 411. Marching Band. (1) I. Membership by audition. 257-411-5-1004

257 414. Theatre Orchestra. (1) I, II. Membership by audition. 257-414-5-1004

257 475. Opera Workshop. (1-6) 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 Departmen of Music and Speech. Vocal Ensemble credit may be earned in this course. Same as Speech 475. 257-475-1-1004

257 490. 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. 257-490-5-1004

257 501. Half Recital. (0) I, II, S. Public performance; vocal or instrumental with suggested performing time of 25 minutes. 257-501-1-1004

257 502. Full Recital. (0) I, II, S. Public performance; vocal or instrumental with suggested performing time of 50 minutes. 257-502-1-1004

Courses in Applied Music

Undergraduate Credit

257 060. Piano Proficiency. (0) I, II, S. Required for graduation of all music majors. 257-060-2-1004

257 203. Voice Class I. (1) I, II. (Not for Voice Majors). 257-203-1-1004

257 204. Voice Class II. (1) I, II. (Not for Voice Majors). 257-204-1-1004

257 206. Piano Class I. (1) I, II, S. For freshmen and transfer music students with no piano background. (Sections also available for non-music majors and non- degree students.) 257-206-1-1004

257 207. 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. 257-207-1-1004

257 208. Keyboard Improvisation. (1) I, II, S. A survey of the basic principles of melodic, harmonic and rhythmic improvisation, including period and style imitation, transportation patterns, etc. Open to all music students who have passed the proficiency exam. 257-208-1-1004

257 209. Piano Ensemble. (1) I, II, S. A study of standard repertoire for Piano Ensemble culminating in a recital. Open to music students who have passed the Proficiency Exam—music education majors given priority. 257-209-1-1004

257 210. Voice Class III. (1) I, II. (Not for Voice Majors). 257-210-1-1004

257 211. Voice Class IV. (1) I, II. (Not for Voice Majors). 257-211-1-1004

257 212. Remedial Class Piano. (1) I, II, S. For Music Majors who have completed Piano Class I and II, but have not yet passed the proficiency exam. 257-212-1-1004

257 232. Woodwind Techniques and Materials. (1) I, II, S. A beginning course designed to teach the fundamentals of playing and methods for teaching woodwind instruments. (For music majors only, and not open to woodwind music majors.) 257-232-1-1004

257 233. Brass Techniques and Materials. (1) I, II, S. A beginning course designed to teach the fundamentals of playing and methods for teaching brass instruments. (For Music Majors only, and not open to Brass Music Majors.) 257-233-1-1004

257 234. String Techniques and Materials. (1) I, II, S. A beginning course designed to teach the fundamentals of playing and methods for teaching stringed instruments. (For Music Majors only, and not open to String Music Majors.) 257-234-1-1004

257 235. 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 Music Majors.) 257-235-1-1004

257 251. Pre-Applied Study. (Var.) I, II, S. For students who do not meet standards for regular applied study. 257-251-3-1004

The following undergraduate courses in Applied Music are offered each semester and summer. The student may earn 1 to 4 hours per semester, with a maximum of 16 hours in any one applicable to a degree.

Lower Level Applied (Freshman-Sophomore)

257 252. Baritone. 257-252-3-1004
257 254. Bassoon. 257-254-3-1004
257 256. Clarinet. 257-256-3-1004
257 258. Double Bass. 257-258-3-1004
257 260. Flute. 257-260-3-1004
257 262. French Horn. 257-262-3-1004
257 263. Harpsichord. 257-263-3-1004
257 264. Oboe. 257-264-3-1004
257 266. Organ. 257-266-3-1004
257 267. Harp. 257-267-3-1004
257 268. Percussion. 257-268-3-1004

257 270. Piano. 257-270-3-1004

257 272. Saxophone. 257-272-3-1004

257 275. Trombone. 257-275-3-1004

257 276. Trumpet. 257-276-3-1004

257 278. Tuba. 257-278-3-1004

257 280. Viola. 257-280-3-1004

257 282. Violin. 257-282-3-1004

257 284. Violoncello. 257-284-3-1004

257 285. Italian Diction. (1) I. Rules for pronouncing and translating Italian vocal texts. (One semester required.) 257-285-0-1004

257 286. Voice. 257-286-3-1004

257 287. German Diction. (1) I. Rules for pronouncing and translating German vocal texts. (One semester required.) 257-287-0-1004

257 306. Voice Class V. (1) I, II. (Not for Voice Majors.) 257-306-1-1004

257 307. Voice Class VI. (1) I, II. (Not for Voice Majors.) 257-307-1-1004

257 427. 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. 257-427-1-1004

257 428. 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. 257-428-1-1004

257 429. Advanced Brass Techniques and Materials. (1-2) 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. 257-429-1-1004

The following undergraduate courses in Applied Music are offered each semester and summer. The student may earn one to four hours per semester, with a maximum of 16 hours in any one applicable to a degree.

Upper Level Applied (Junior-Senior).

257 432. Baritone. 257-432-3-1004

257 434. Bassoon. 257-434-3-1004

257 436. Clarinet. 257-436-3-1004

257 438. Double Bass. 257-438-3-1004

257 440. Flute. 257-440-3-1004

257 442. French Horn. 257-442-3-1004

257 443. Harpsichord. 257-443-3-1004

257 444. Oboe. 257-444-3-1004

257 446. Organ. 257-446-3-1004

257 447. Harp. 257-447-3-1004

257 448. Percussion. 257-448-3-1004

257 450. Piano. 257-450-3-1004

257 452. Saxophone. 257-452-3-1004

257 454. Trombone. 257-454-3-1004

257 456. Trumpet. 257-456-3-1004

257 458. Tuba. 257-458-3-1004

257 460. Viola. 257-460-3-1004

257 462. Violin. 257-462-3-1004

257 464. Violoncello. 257-464-3-1004

257 465. French Diction I. (1) I. Rules for pronouncing and translating French vocal texts. 257-465-0-1004

257 466. Voice. 257-466-3-1004

257 467. French Diction II. (1) II. Rules for pronouncing and translating French vocal texts. Pr.: Music 465. 257-467-0-1004

257 480. Voice Class VII. (1) I. (Not for Voice Majors). This class is accompanying in a voice studio for piano majors (voice option). Pr.: Music 307. 257-480-1-1004

257 482. Voice Class VIII. (1) II. (Not for Voice Majors). This class is accompanying in a voice studio for piano majors (voice option). Pr.: Music 480. 257-482-1-1004

Graduate Credit

Performance: Pr.: For all performance courses technical competence is determined by audition. Levels commensurate with standards expected in that field for the B.M. degree are required.

257 641. Secondary Performance Area. (1-2) For graduate students who wish to study an instrument (or voice) other than the major applied instrument (or voice). Pedagogical methods and fundamentals are stressed. 257-641-3-1004

257 838. Opera Workshop. (1-6) I, II, S. Opera workshop for graduates. 257-838-1-1004

257 839. Vocal Ensemble. (1) I, II, S. Performance and study with established University vocal organization or small ensenble. 257-839-5-1004

257 840. Instrumental Ensemble. (1) I, II, S. Performance and study with an established university instrumental organization or in a small ensemble. 257-840-5-1004

257 841. Collegium Musicum. (1) I, II, S. An ensemble devoted primarily to the performance of music written before 1700. Authentic instruments used when possible. 257-841-5-1004

The following courses in Applied Music offered each semester and summer carry from one to four hours credit per semester.

257 852. Baritone. 257-852-3-1004

257 854. Bassoon. 257-854-3-1004

257 856. Clarinet. 257-856-3-1004

257 858. Double Bass. 257-858-3-1004

257 859. Conducting. 257-859-3-1004

257 860. Flute. 257-860-3-1004

257 862. French Horn. 257-862-3-1004

257 863. Harpsichord. 257-863-3-1004

257 864. Oboe. 257-864-3-1004

257 866. Organ. 257-866-3-1004

257 868. Percussion. 257-868-3-1004

257 870. Piano. 257-870-3-1004

257 872. Saxophone. 257-872-3-1004

257 875. Trombone. 257-875-3-1004

257 876. Trumpet. 257-876-3-1004

257 878. Tuba. 257-878-3-1004

257 880. Viola. 257-880-3-1004

257 882. Violin. 257-882-3-1004

257 884. Violoncello. 257-884-3-1004

257 886. Voice. 257-886-3-1004

Graduate Research Courses

257 799. Problems in Music. (Var.) I, II, S. Individual guided work in a selected area. Pr.: Six hours graduate credit in music. 257-799-4-1004

257 801. 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. 257-801-0-1006

257 898. Master's Report in Music. (2) I, II, S. Independent directed research leading to Master's Report. Pr.: 16 hours graduate credit in music. 257-898-1-1006

257 899. Research in Music. (Var.) I, II, S. Independent research that may lead to Master's Thesis. Pr.: 16 hours graduate credit in music. 257-899-4-1006

Fees for Private Music Lessons. University students enrolled in the applied music or music education curriculum or the Bachelor of Arts degree 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 on page 16 of this catalog.

PHILOSOPHY

B. R. Tilghman, Head of Department

Professor Tilghman;* Associate Professors Reagan* and Scheer;* Assistant Professors Exdell,* Hamilton,* O'Neil, and Smith. Emeritus: Professor Miller.

The program in philosophy is designed to give the student a broad knowledge of philosophy, its history, problems, and methods. Philosophy is the study of the conceptual foundations of virtually every area of human thought and activity, art, science, religion, moral conduct, politics, etc., and anyone who engages in any kind of reflective thinking about these areas of thought and activity is bound to encounter problems of a philosophical nature. Courses in philosophy are intended to teach students to identify these problems and to deal with them in an intelligent and informed manner.

While at the present time the only professional opportunities for trained philosophers are in college and university teaching, philosophy is recommended as a highly suitable major for undergraduates desiring general training in the liberal arts, as excellent preparation for specialized graduate study in a number of other disciplines, and as preparation for professional training in such fields as law, ministry, and government service.

Undergraduate Study

A major in philosophy requires 36 hours in philosophy and must include the following courses: Phil. 220, 300, 301 and 440. The remaining eight courses may be taken in accordance with one of the two program options:

A. Philosophy concentration: eight courses in philosophy of which six must be at or above the 400 level.

B. Interdisciplinary option: four courses in a related discipline of which three must be at or above the 400 level; and four courses in philosophy of which three must be at or above the 400 level. Due to the flexibility of this option, each major selecting it must develop a program in consultation with the department's undergraduate adviser. The program must then be approved by the department. Some examples of related disciplines are: psychology, political science, pre-law, linguistics, mathematics, history, and religion.

Courses in Philosophy

Undergraduate Credit

259 100. 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. 259-100-0-1509

259 105. Introduction to Critical Thinking. (3) I, II, S. The various forms of arguments and persuasion are analyzed in order to develop the student's ability to distinguish between sound and fallacious reasoning. Particular attention is paid to advertising, editorial writing, and political reasoning. 259-105-0-1509

259 110. 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. 259-110-0-1509

259 115. Introduction to Philosophy of Religion. (3) I, II, S. 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. 259-115-0-1509

259 120. Introduction to the Philosophy of Art and Literature. (3) I, II, S. An introduction to philosophical problems concerning the concept of art, aesthetic value, and art appreciation and criticisim. For students of art, architecture, literature, music and theater. 259-120-0-1509

259 125. Introduction to Philosophy of Science. (3) I, II, S. Examines the nature of science, how it differs from pseudosciences such as astrology and raises questions about the nature of reality and social value of science. 259-125-0-1509

259 130. Introduction to Ethics. (3) I, II, S. Examines the nature of morality, moral knowledge and moral justifications, and the relation between morality, religion, and culture. These issues are approached through a study of contemporary moral problems concerning abortion, war, sexuality, etc. 259-120-0-1509

259 135. 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. 259-135-0-1509

259 140. Introduction to Philosophy of Mind. (3) I, II, S. 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. 259-140-0-1509

259 145. Introduction to Philosophical Classics. (3) I, II, S. An introduction to philosophy through the careful reading of selected works of a major influence in the history of philosophy. 259-145-0-1509

259 215. Honors Introduction to Philosophy. (3) I, II. An introduction to the main problems in philosophy. For students in the Honors Program. 259-215-0-1509

259 220. Symbolic Logic I. (3) I, II, S. A systematic introduction to modern logic. Truth-functions, truth tables, and calculus of propositions, classes and relations. 259-220-0-1509

259 300. 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. 259-300-0-1509

259 301. History of Modern Philosophy. (3) II. The development of philosophical ideas from the Renaissance to the nineteenth century. 259-301-0-1509

259 310. Comparative Religion. (3) II. An introduction to the central beliefs of the major religions of both East and West and an examination of philosophical problems that arise in the comparative study of religions (for example, the problems of the relativity of religious belief). Pr.: One course in philosophy. 259-310-0-1509

259 397. Experimental Studies in Philosophy. (1-6). I, II. Experimental and interdisciplinary studies in philosophy. Topics selected in consultation with instructor. Pr.: Permission of instructor. 259-397-0-1509

259 399. Honors Seminar in Philosophy. (3) I 1979. 259-399-0-4900

259 400. Philosophy of Religion. (3) II. 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. 259-400-0-1509

259 410. Social-Political Philosophy. (3) I or II and alt. S. 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. 259-410-0-1509

259 415. 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. 259-415-0-1509

259 420. 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 one course in social science. 259-420-0-1509

259 425. 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. 259-425-0-1509

259 430. Existentialism. (3) I or II. A study of prominent thinkers in the existentialist tradition. Pr.: One course in philosophy or permission of instructor. 259-430-0-1509

259 440. Ethical Theories. (3) I or II. 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. 259-440-0-1509

259 499. Senior Honors Thesis (2) I, II, S. Open only to honor students in the Arts and Sciences Honors Program. 259-499-4-1509

Undergraduate And Graduate Credit In Minor Field

259 500. Philosophy of the Social Sciences. (3) II. An examination of the possibility of a science of man 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. 259-500-0-1509

259 505. The Philosophy of Science. (3) I or II. Philosophical problems concerning science, its methods, laws and theories. Pr.: One course in philosophy. 259-505-0-1509

259 510. Symbolic Logic II. (3) I. An advanced study of logical systems and problems in logical theory. Pr.: Phil. 220. 259-510-0-1509

259 520. The Philosophy of Mind. (3) I. 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. 259-520-0-1509

259 530. Epistemology. (3) I. An examination of philosophical problems about the nature of our knowledge of the world. Pr.: One course in philosophy. 259-530-0-1509

259 540. Metaphysics. (3) II. A critical examination of theories about things and their qualities, causality, space, and time. Both traditional and contemporary sources will be used, but emphasis will be placed on the latter. Pr.: One course in philosophy. 259-540-0-1509

259 550. The Philosophy of Language. (3) I or II. Philosophical problems concerning the nature of language and such concepts as meaning and truth. Pr.: One course in philosophy. 259-550-0-1509

259 560. Advanced Ethics. (3) I or II in alt. years. Detailed examination of selected topics in contemporary ethical theory. Pr.: Phil. 440. 259-560-0-1509

259 565. 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. 259-565-0-1509

259 570. Recent Aesthetic Theory. (3) II. A study of selected work of current importance in the philosophy of art. Pr.: Phil. 120. 259-570-0-1509

Graduate And Undergraduate Credit

259 600. Studies in Ancient Philosophy. (3) I. A detailed study of a selected philosopher or movement in the history of Greek and Roman philosophy. Pr.: Phil. 300. 259-600-0-1509

259 605. Studies in 17th and 18th Century Philosophy. (3) II. A detailed study of a selected philosopher, school, or problem drawn from the history of philosophy in the 17th and 18th centuries. Pr.: Phil. 301. 259-605-0-1509

259 610. Recent European Philosophy. (3) I or II. An examination of important issues and movements in 20th century European philosophy. Emphasis upon existentialism and phenomenology. Pr.: One course in philosophy. 259-610-0-1509

259 620. The Development of Analytical Philosophy. (3) I. The history of analytical philosophy in the first four decades of the 20th century. A study of the work of Moore, Russell, the early Wittgenstein, and the logical positivists. Pr.: One course in philosophy. 259-620-0-1509

259 630. Recent British-American Philosophy. (3) II. A detailed study of selected philosophical writings of current interest in Great Britain and the United States. Pr.: One course in philosophy. 259-630-0-1509

259 680. Problems in Philosophy. (Var.) I, II, S. Independent study for qualified students. Pr.: Background of courses required for problem undertaken. 259-680-3-1509

259 701. Topics in Metalogic. (3) I or II. Selected topics in the analysis of first-order theories and the foundations of mathematics. Pr.: Phil. 510 or Math. 511. 259-701-0-1509

PHYSICS

Charles Hathaway, Head of Department*

Professors Bark,* Bhalla,* Curnutte,* Dale,* Dragsdorf,* Ellsworth,* Gray,* Hathaway,* Legg,* Macdonald,* Manney,* Richard,* Tawara (visiting), and Williams;* Associate Professors Cocke,* Compaan,* Eck,* Folland,* Lee,* McGuire,* Rosenkilde,* Spangler,* Weaver;* and Zollman;* Assistant Professors Chandra (visiting), Endal (visiting), Jack,* Lin (visiting), and Sorensen; Research Associates Brown, Gardner, Meade, A. Schmiedekamp, C. Schmiedekamp, and Sethna. Emeritus: Professor Cardwell;* Associate Professors Avery,* Chapin,* and 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 always 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. This is a continuing process in which the only limitations are the minds of man and nature's willingness to divulge its secrets.

Undergraduate Study

A major in physics equips a liberal arts student with a broad education which is uniquely adapted to our time. The program for majors is designed for individuals who will apply their knowledge in interdisciplinary research, in applied research and management, in basic research or in teaching. The physics curriculum provides a broad science background suitable for the creative application of science and mathematics to interdisciplinary problems which will be of increasing importance to society and the individual. Although physics does not exclude the intuitive mind, the emphasis on mathematics tends to favor the more analytically inclined.

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, 150, 213, 214, 506, 522, 532, 551, 636; Chem. 210, 230; Math. 220, 221, 222, 240, and nine additional hours of science electives.

The nine hours of science electives may be selected with approval of the physics department undergraduate adviser from courses, 400 level or higher, in the departments of Chemistry, Computer Science, 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, or nuclear engineering or business administration. Interested students should inquire about these programs with 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.

Students who plan to teach physics in college should consider a program administered by the College of Education leading to the degree, Doctor of Philosophy in education with a specialty in college physics teaching. Courses are taken in both physics and education and a student's thesis research may involve work in either area.

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 their undergraduate preparation by completing the undergraduate courses without receiving graduate credit.

Information on the undergraduate and graduate programs, the supporting facilities, financial support, and the 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 under the heading "Research Resources" on page 21.

Courses in Physics

265 017. Colloquium in Physics. (0) I, II. Required of graduate majors and undergraduate majors.

Undergraduate Credit

265 100. Undergraduate Physics Seminar I. (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. 265-100-2-1902

265 101. Man's Physical World I. (3) I, II, S. The courses Man's 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. Man's 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. 265-101-0-1901

265 102. Man's Physical World II. (3) I, II, S. Cont. of Phys. 101. Man's 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. 265-102-0-1901

265 103. Man's Physical World I Laboratory. (1) I, II, S. Two hours lab. a week. Pr. or conc.: Phys. 101. 265-103-1-1901

265 104. Man's Physical World II Laboratory. (1) I, II, S. Two hours lab. a week. Pr. or conc.: Phys. 102. 265-104-1-1901

265 107. Physical Science Colloquium. (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. 265-107-0-1901

265 113. General Physics I. (4) I, II, S. Mechanics, heat, fluids, waves and sound. Two hours lec., one hour rec., one hour quiz and two hours lab. a week. Pr.: Math 150 or 1½ units of high school algebra and 1 unit high school trigonometry.265-113-1-1902

265 114. General Physics II. (4) I, II, S. Electricity, light, and modern physics. Two hours lec., one hour rec., one hour quiz, and two hours lab. a week. Pr.: Phys. 113. 265-114-1-1902

265 115. 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. 265-115-1-1902

265 125. Physics for Musicians. (3) II. Selected topics applied to the physics of music and musical instruments. 265-125-0-1902

265 150. Undergraduate Physics Seminar II. (1) II. Continuation of Phys. 100. 265-150-2-1902

265 191. Descriptive Astronomy. (3) I, II, S. A qualitative study of the sun and planets, stars and galaxies; a survey of what is known and how it is known. Occasional planetarium and telescopic observing sessions. 265-191-0-1911

265 192. Descriptive Astronomy Laboratory. (1) I, II, S. Two hours laboratory a week; use of telescopes, planetarium and laboratory equipment in astronomy; open to interested students without concurrent enrollment in Phys. 191 by consent of instructor. 265-192-1-1911

265 193. Descriptive Meteorology. (3) II, S. Nontechnical treatment of the fundamentals of modern meteorology and associated physical processes. 265-193-0-1913

265 213. Engineering Physics I. (5) I, II. Mechanics, heat and sound; for technical students. Two hours lec., two hours rec., one hour quiz, and two hours lab. a week. Pr. or conc.: Math. 221. 265-213-1-1902

265 214. Engineering Physics II. (5) I, II. Magnetism, electricity, and light; for technical students. Two hours lec., two hours rec., one hour quiz, and two hours lab. a week. Pr.: Phys. 213, Math. 221. 265-214-1-1902

265 300. Physics in Relation to Other Disciplines. (1-3) On demand. Variable content, offered only by pre-arrangement 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. 265-300-3-4900

265 301. Physics Honors Seminar (1-3) I 1979. Open only to students in the Arts and Sciences Honors Program. Other students may be enrolled with permission of the instructor. 265-301-0-1902

265 400. 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 six hours. Pr.: Junior standing and consent of instructor. 265-400-3-1902

265 401. Dialogues in Physics. (2) On sufficient demand. Discussion of current research topics such as fusion power, laser development, superconductivity, radiation effects, quasi-stellar objects. Offered for non-science students. Topics covered will vary each semester depending on current developments and interests. Classes will include both discussions and demonstrations, and occasional special lectures by visiting scholars. Lay scientific literature will be used as resource material. Pr. or conc.: Phys. 102. This course may not be repeated. 265-401-0-1902

265 435. Introduction to Holography. (2) A presentation of the concepts on which holography (a technique for the recording of three dimensional information or images on film by using light interference) is based, with practice of the technique. One hour of lecture and one-two hour lab. each week. Pr. Phys. 101 or 115. 265-435-1-1901

265 451. Modern Physics. (3) A qualitative introduction to contemporary theories and problems in physics. Pr.: Phys. 114 or consent of instructor. 265-451-0-1902

265 460. Undergraduate Topics in Physics. (1-6). Special topics in physics not completely treated in other courses. Offered on sufficient demand. Pr.: Phys. 114 or equiv. 265-460-0-1902

Undergraduate And Graduate Credit In Minor Field

265 506. Physics Laboratory I. (3) I. See Phys. 616. One hour rec. and six hours lab. a week. Pr.: One year of college physics. 265-506-1-1902

265 515. Physics for Science Teachers. (2-3) 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 sub-nuclear particles, relativity, or the historical development of some physical concept. May be repeated for a maximum of 6 hours credit. 265-515-0-1902 Pr.: One year of college physics.

265 516. Physics Laboratory II. (3) II. Cont. of Phys. 506. See Phys. 616. One hour rec. and six hours lab. a week. Pr.: Phys. 506. 265-516-1-1902

265 522. Mechanics I. (3) I. Principles of statics and dynamics of particles and rigid bodies by the methods of the calculus. Pr.: Phys. 214 or 521; Math. 240 or conc. enrollment. 265-522-0-1902

265 523. Mechanics I Recitation. (2) I. Discussion section for problems presented in Phys. 522. Pr.: Students must be concurrently enrolled in Phys. 522. 265-523-0-1902

265 525. 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. 265-525-0-1901

265 532. 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 or 521; Math. 240 or conc. enrollment. 265-532-0-1902

265 535. Fundamentals of Holography. (3) A presentation of the concepts on which holography (a technique for recording three dimensional information or images on film by using light interference) is based, with practice of the technique. This course, parallel to Phys. 435, is for students with a science and engineering background. Two hours of lecture and one-two hour laboratory each week. Pr.: Phys. 214 or Phys. 114 and Math. 221. 265-535-1-1901

265 546. Radioactive Tracer Techniques. (3). (See Chem. 546.) Physics and chemistry of radioactive substances in the fields of biological and physical science. Two hours rec. and three hours lab. a week. Taught in cooperation with the Department of Chemistry. Pr.: Chem. 230, Phys. 114 or equiv. 265-546-1-1902

265 551. Atomic Physics. (3) II. An introduction to contemporary theories and problems in physics. Pr.: Phys. 214; Math. 222. 265-551-0-1902

265 552. Instrumental Optics. (3) The application of the fundamentals of geometrical and physical optics to optical instruments. Phenomenology of the interaction of light and matter. Characteristics of light sources, filters, and detectors. Measurement of light and radiation. Pr.: Phys. 114 or equiv. 265-552-0-1902

265 553. Introduction to the Physics of Lasers. (3) II. A study of the physics of lasers. Survey of current laser systems. Technological applications. Pr.: Phys. 114 or 214. 265-553-0-1902

265 561. Geophysics. (3) II alt. years. Principles and methods of exploration geology by physical methods. Pr.: Phys. 114 or 214; Math. 221. 265-561-0-1916

265 595. Astronomy. (3) A quantitative and qualitative survey of the universe primarily for the science major. Occasional planetarium and telescopic observation sessions. Pr.: One year of college physics. 265-595-0-1911

Undergraduate And Graduate Credit

265 611. Introductory Quantum Mechanics I. (3) I. Methods of quantum mechanics and solution of selected problems in atomic, molecular, solid-state and nuclear physics. Special theory of relativity. Pr.: Phys. 522, 551; Math. 240. 265-611-0-1902

265 612. Introductory Quantum Mechanics II. (3) II. Cont. of Phys. 611. Pr.: Phys. 611. 265-612-0-1902

265 616. Advanced Physics Laboratory. (1-3) I, II. The courses Phys. 506, 516 and 616 are designed to give the advanced student an opportunity to perform experiments of historical and current significance and to develop skill in making precise physical measurements involving the use of high-grade mechanical, optical, electrical, and thermal instruments. Pr.: Phys. 506 or equiv. 265-616-0-1902

265 621. Mechanics II. (3) II. Cont. of Phys. 522. Pr.: Phys. 522. 265-621-0-1902

265 631. Electricity and Magnetism II. (3) I. Cont. of Phys. 532. Pr.: Phys. 532. 265-631-0-1902

265 635. Plasma Physics. (3) I. (see Nuclear Engineering 635) 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. each week. Pr.: Phys. 532 or E.E. 557, and Phys. 621. 265-653-0-1902

265 636. 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 of lec. and six hours of lab. each week. Pr.: Phys. 214. 265-636-1-1902

265 641. Nuclear Physics. (3) II. Modern theories of nuclear physics. Pr.: Phys. 611. 265-641-0-1904

265 651. Introduction to Optics. (3) I. Introduction to modern concepts in the study of optics: electromagnetic waves, interference, coherence, Fraunhofer and Fresnel diffraction, holography, non-linear optics, lasers, photon counting. Three hours lec. each week. Students desiring simultaneous laboratory experience with the phenomena discussed should enroll for one or two hours in Phys. 616. Pr.: Phys. 532 or E.E. 557. 265-651-0-1902

265 671. Thermodynamics and Statistical Physics. (3) II. Pr.: Phys. 522; Math. 240. 265-671-0-1902

265 681. Semiconductor Physics. (3) I alt. years. The physics of conduction in homogeneous semiconductors and semiconductor device structures. Pr.: At least senior standing in physics or electrical engineering. 265-681-0-1902

265 691. Astrophysics. (3) A quantitative study of the sun and stars; structure and evolution; intrinsic properties; solar activity; galaxies; chemical evolution. Pr.: Phys. 522, 532. 265-691-0-1912

265 701. Journal Club. (Var.) I, II. Seminar in current topics in physics. Pr.: Graduate standing in physics. 265-701-2-1902

265 707. 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. 265-707-3-1902

265 711. Introduction to Theoretical Physics. (3) I. Pr.: Phys. 621. 265-711-0-1902

265 731. Electrodynamics I. (3) II. Pr.: Phys. 631. 265-731-0-1902

265 751. Atomic Spectra. (3) I. Atomic energy levels and the origin of spectra. Pr.: Phys. 611. 265-751-0-1902

265 752. Molecular Spectra. (3) II. Molecular energy levels and the origin of spectra. Pr.: Phys. 611. 265-752-0-1903

265 781. X-ray and Crystal Physics. (3) I alt. years. Pr.: Phys. 532. 265-781-0-1902

265 782. Introduction to Solid State Physics. (3) II. Pr.: Phys. 611. 265-782-0-1902

265 786. X-ray Laboratory. (1) I alt. years. Three hours lab. a week. Pr. or conc.: Phys. 781. 265-786-1-1902

Graduate Credit

265 800. 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. 265-800-3-1902

265 808. 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. 265-808-3-1902

265 811. Quantum Mechanics I. (3) I. Pr.: Phys. 611, 711, 821. 265-811-0-1902

265 821. Advanced Dynamics. (3) II. Pr.: Phys. 711. 265-821-0-1902

265 899. Research in Physics. (Var.) I, II, S. Master's level research. Pr.: Consent of instructor. 265-899-4-1902

265 910. 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. 265-910-3-1902

265 911. Quantum Mechanics II. (3) II. Pr.: Phys. 811. 265-911-0-1902

265 912. Advanced Quantum Mechanics. (3) I. Relativistic quantum mechanics; scattering theory; second quantization and the many-body problem; introduction to quantum electrodynamics. Pr.: Phys. 911. 265-912-0-1902

265 913. Advanced Topics in Mathematical Physics. (3) I. Critical studies of selected advanced topics. May be repeated once for credit. Pr.: Phys. 711. 265-913-0-1902

265 914. Quantum Field Theory. (3) Offered on sufficient demand. Pr.: Phys. 811. 265-914-0-1902

265 931. Electrodynamics II. (3) I. Pr.: Phys. 731. 265-931-0-1902

265 941. Advanced Nuclear Physics. (3) I. Pr.: Phys. 641, 811. 265-941-0-1904

265 942. Advanced Nuclear Physics II. (3) Cont. of Phys. 941. Pr.: Phys. 941. 265-942-0-1904

265 943. Advanced Topics in Nuclear Physics. (3) Critical studies of selected advanced topics. May be repeated once for credit. Pr.: Phys. 641. 265-943-0-1904

265 951. Advanced Topics in Molecular Spectroscopy. (3) Critical studies of selected advanced topics. May be repeated once for credit. Pr.: Phys. 752. 265-951-0-1903

265 952. Advanced Topics in Optics. (3) Critical studies of selected advanced topics. May be repeated once for credit. Pr.: Phys. 651. 265-952-0-1902

265 953. Advanced Topics in Atomic Interactions. (Var.) Critical studies of advanced topics in atomic interactions. Pr.: Phys. 612. 265-953-3-1904

265 971. Statistical Mechanics. (3) I. Pr.: Phys. 611, 671, 821. 265-971-0-1902

265 981. Solid State Physics. (3) I. Pr.: Phys. 782, 971, 911 or conc. enrollment. 265-981-0-1902

265 982. Advanced Topics in Solid State Physics. (3) II. Critical studies of selected advanced topics. May be repeated once for credit. Pr.: Phys. 782. 265-982-0-1902

265 983. Advanced X-ray Physics. (3) Offered on sufficient demand. Pr.: Phys. 781, Math. 240. 265-983-0-1902

265 999. Research in Physics. (Var.) I, II, S. Doctoral level research. Pr.: Consent of instructor. 265-999-4-1902

POLITICAL SCIENCE

Michael W. Suleiman, Head of Department*

Professor Suleiman;* Associate Professors Althoff,* Gustafson,* Hajda,* Iyengar,* Lynn,* Richter,* and Williams;* Assistant Professors Linford,* Loss, Sloan,* and Unekis. Emeritus: Professor Douglas.*

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 is intended to equip the student with the skills necessary to choose among a wide variety of careers in public service, both national and international, 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 which includes study in related social sciences, such as economics, history, psychology, sociology, anthropology, and geography. The political scientist should also develop awareness of the intimate relationships between social and physical science. In addition, the major will find familiarity with statistics and mathematics is indispensable in using the tools now available for describing and explaining political phenomena.

Advisory Services. A pre-law program also may be pursued through a major in political science. A pre-law adviser helps the student select an appropriate course of study leading toward a career in law, and offers individual assistance in selecting a law school.

A selection of courses for those interested in public administration is available, and an adviser for this field is available through the head of the department.

Several members of the department have backgrounds in non-academic careers—including national and international government service, business, party politics, and journalism—besides their professional training in political science. Students contemplating careers in these and other fields will find non-academic perspectives available to help them in their choices.

Specialized Curricula. The department takes part in several interdepartmental programs whereby students can coordinate their course work around a specific set of phenomena. Two such firmly established programs include:

South Asia Area Studies. The department participates in the University-wide South Asia area studies (see detailed information under South Asia center, page 99.

Armed Forces and Society. Political science and several other departments offer coordinated coursework 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.

Requirements for the Major. A major consists of a minimum of 27 credit hours in political science, distributed as follows: Introduction to Political Science (269 110 or 269 111) or U.S. Politics (269 325) or both. And a minimum of 18 hours from courses numbered 500 and above, including at least one 700-level course in each of the following four areas of political science: American government and politics, comparative government and politics, international relations, and political thought.

Information for Non-Majors. To encourage the widest possible undergraduate involvement in systematic political analysis, most political science courses numbered 100 through 799 are open to non-majors without prerequisite courses and without prejudice to non-majors. As a discipline, the study of politics is expansive enough to permit intraclass adjustments to different backgrounds and objectives, while maintaining the rigorous inquiry of social science.

Introduction to Political Science (269 110) is designed for freshmen and sophomore majors and non-majors. United States Politics (269 325) and World Politics (269 333) are not normally open to juniors and seniors. Non-majors with questions about opportunities and requirements for non-majors in political science courses should consult the head of the department or faculty members concerned. The Political Science Club, a student group of majors, also is a source of information and guidance for undeclared majors and non-majors. The undergraduate advisory committee is available to non-majors as well as majors.

Graduate Study

In accordance with Graduate School requirements, an M.A. degree in political science consists of a minimum of 30 semester hours of which at least 24 shall be in political science (i.e., a maximum of six credits in other disciplines may be applied toward the degree). Each candidate must take Political Science 800, Seminar: Scope and Methodology of Political Science; at least two basic field seminars from among the following: American Government (269 805); International Politics (269 811); Political Thought (269 821); and Comparative Politics (269 841). The remaining minimum requirements of 15 hours coursework (thesis option) or 19 hours coursework (report option) should be selected in consultation with the adviser and should emphasize seminar (800-level) offerings. The report option is possible only if approved by the student's adviser.

Facilities for research include the resources of the University and departmental libraries, the computer center, and, in the vicinity of the University, Eisenhower and Truman Libraries, the State Historical Library and other research centers.

There is a Graduate Political Science Association and a departmental graduate adviser. A limited number of assistantships is available for qualified students.

Career Opportunities in Political Science. A major in political science prepares a student for a wide range of career opportunities. Among the careers frequently chosen by our majors are law, teaching, public administration, business, and journalism. Today governments at all levels are the largest employers in the USA. A political science major prepares a student for a variety of positions with governmental agencies at the local, state, regional, national, and international levels. In addition, it prepares students for a wide range of political and policy-related careers.

Courses in Political Science

Undergraduate Credit

269 110. Introduction to Political Science. (3). 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. 269-110-0-2207

269 111. 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. 269-111-0-2207

269 321. 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. 269-321-0-2207

269 325. United States Politics. (3). The national government with emphasis on constitutional principles, basic structure, functions, and the political process. 269-325-0-2207

269 333. World Politics. (3). 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. 269-333-0-2207

269 344. Introduction to Comparative Politics. (3). 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. 269-344-0-2207

269 355. Contemporary Issues. (3). Study and analysis of selected political topics of immediate relevancy and concern. May be repeated only one time. 269-355-0-2207

269 366. Practical Politics, (3). Strategies and techniques of running for office, organizing a campaign, mobilizing community resources, direct action lobbying, related practical aspects of local level citizen politics. Open to all students, but not applicable to the political science major. 269-366-0-2207

269 377. 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.: Pol. Sci. 110 or 325 or another social science course. 269-377-0-2207

269 399. Honors Seminar in Political Science. (1-3). 269-399-0-4900

269 401. Topics in Politics. (1-3). Different subject areas in politics are selected for intensive study. May be repeated for a total of six hours with adviser's approval. 269-401-0-2207

269 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 269-499-4-2207

Undergraduate And Graduate Credit In Minor Field

269 501. 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.: Pol. Sci. 110 or 325 or sophomore standing. 269-501-0-2207

269 505. Introduction to the Civilization of South Asia I. (3). An interdisciplinary survey of the development of civilization in South Asia, 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, Soc. 505, Anthro. 505). 269-505-0-2207

269 506. Introduction to the Civilization of South Asia II. (3). Interdisciplinary survey of recent and contemporary civilization in India, Pakistan, Ceylon, Nepal, 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, Soc. 506, Anthro. 506). 269-506-0-2207

269 507. Introduction to Public Administration. (3). 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.: Pol. Sci. 110 or 325 or Econ. 110. 269-507-0-2207

269 511. 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. 269-511-0-2207

269 520. State and Local Government. (3). The American system of federalism with emphasis on the government and politics of the American states and their subdivisions. Pr.: Pol. Sci. 110 or 325 or sophomore standing. 269-520-0-2207

269 521. Agricultural Politics. (3) 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 placed upon the nature of politics shaping the present and future of rural and small town Kansas. Pr.: Pol. Sci. 110 or 325 or sophomore standing. 269-521-0-2207

269 542. Interdependence in International Politics. (3) II. Consideration of the evolving international system in which no nation is totally politically independent of other nations due to crises over, for example, energy and/or food supplies, world health and political rivalries. Pr.: Pol. Sci. 110 or 325 or Econ. 110 and sophomore standing. 269-542-0-2207

269 545. The Politics of Developing Nations. (3). Comparative analysis of politics in emergent states with emphasis on processes of modernization and nation building. Pr.: Pol. Sci. 110 or 344 or sophomore standing. 269-545-0-2207

269 555. Senior Honors Seminar. (3). Open to senior majors who have attained a 3.0 grade point average in political science. 269-555-0-2207

269 565. Policy Analysis and Evaluation. (3) II. The relationship between public policy and the distribution of values, goods and services in society, including a study of policy evaluation, particularly in the area of distributive policies. Students analyze policies in an area of choice; e.g., agriculture, business, health, income, trade, etc. Pr.: Pol. Sci. 325 or 507 or one course in Social Science. 269-565-0-2207

AMERICAN GOVERNMENT AND POLITICS

Undergraduate And Graduate Credit

269 608. Public Personnel Administration. (3) II. 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.: Pol. Sci. 325 or 507 or Econ. 110 and junior standing. 269-608-0-2207

269 702. Political Sociology. (3). An introduction to the principles of political sociology; theories of politics and sociology processes of political sociology; participation within and outside established organizational channels, recruitment of elites, communication and influence, power, decision-making and policy outputs. Data will be presented from a cross-national perspective. Pr.: Soc. 211; Pol. Sci. 110 and junior standing or consent of instructor. (Same as Soc. 702). 269-702-0-2207

269 703. Political Parties and Elections. (3). Origins, structure and function of political parties. Dynamics of the two-party system. Roles of third parties. Analysis of election results and voting behavior. 269-703-0-2207

269 704. Political Polls and Public Opinion. (3). Group theory and politics. Structure, internal politics, and techniques of interest groups and their impact on public policy. Analysis of formation and measurement of political data, and utilization of computers in political research. 269-704-0-2207

269 705. The American Presidency. (3). The presidency as an institution, its evolution, Congressional relationships, executive organization. 269-705-0-2207

269 706. Sex and Politics. (3). 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. 269-706-0-2207

269 707. Research Methods in Political Science. (3). Principles of research design, measurement of political phenomena, methods for collecting and analyzing political data, and utilization of computers in political research. 269-707-0-2207

269 711. The Legislative Process. (3). 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. 269-711-0-2207

269 713. The Judicial Process. (3). Values of the rule of law and how they are maintained in Western democracies; general significance of the legal order; private rights and public duties; nature of the judicial process. 269-713-0-2207

269 714. Constitutional Law I. (3). Legal foundations of the American political system as defined by constitutional provisions and judicial interpretation. Pattern of governmental power; federalism, separation of powers, judicial review. Constitution as a positive instrument of government; the commerce of power. 269-714-0-2207

269 715. Constitutional Law II. (3). Constitution as a positive instrument of government: fiscal powers over foreign affairs. Constitution as a negative restraint on government: substantive and procedural limitations. 269-715-0-2207

269 716. Civil Liberties. (3). History, theory, and development of Constitutional liberties in the Bill of Rights and the Fourteenth Amendment. 269-716-0-2207

269 717. 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. 269-717-0-2207

269 718. Urban Politics. (3). Fundamental problems of political power and decision-making in urban-suburban governmental settings. 269-718-0-2207

269 719. National Security Policy and Process. (3). 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. 269-719-0-2207

COMPARATIVE GOVERNMENT AND POLITICS

269 721. European Political Systems. (3). Comparative analysis of British democracy, totalitarianism, and contemporary Continental European political systems. 269-721-0-2207

269 722. Latin American Politics. (3). 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. 269-722-0-2207

269 723. South Asian Political Systems. (3). Analysis of selected political systems of South Asia. 269-723-0-2207

269 724. Middle Eastern Political Systems. (3). 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. 269-724-0-2207

269 725. Southeast Asian Political Systems. (3). Comparative analysis of selected political systems in Southeast Asia including consideration of problems of nationalism and political development. 269-725-0-2207

269 726. African Political Systems. (3). Comparative analysis of selected political systems of sub-Sahara Africa, including consideration of problems of nationalism and political development. 269-726-0-2207

269 727. The Soviet Political System. (3). Government and politics of the Soviet Union. 269-727-0-2207

269 728. Comparative Security Establishments. (3). 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. 269-728-0-2207

269 729. Administration in Developing Nations. (3). Administrative problems of developing nations of Asia, Africa, and Latin America; principal models for study of comparative public administration; programs in development administration. 269-729-0-2207

269 735. Advanced Public Administration. (3) I. Theories of public administration as they relate to specific problems of administration with special emphasis on administrative decision-making in the political environment. Evaluation of new legal and theoretical trends. Pr.: Pol. Sci. 325 or 507 or Bus. 420 or Econ. 110 and junior standing. 269-735-0-2207

269 737. Politics on Budgeting. (3) II. Focuses on the political aspects of developing budgets for federal, state and local governmental agencies. Pr.: Pol. Sci. 507 or Bus. 420. 269-737-0-2207

INTERNATIONAL RELATIONS

269 741. International Relations. (3). Analysis of the nature of international relations with emphasis on contemporary theories explaining the international behavior of states. 269-741-0-2207

269 743. American Foreign Policy. (3). 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. 269-743-0-2207

269 745. International Politics of Europe. (3). 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. 269-745-0-2207

269 747. International Law. (3). Theories of international law, and general problems, such as: recognition, responsibility, war crimes, sources, evidence, codification, and settlement of disputes. 269-747-0-2207

269 749. International Defense Strategies. (3). 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. 269-749-0-2207

269 751. International Organization. (3). Structure, functions, values, and effectiveness of international organizations with emphasis on the United Nations, Common Market and other regional arrangements. 269-751-0-2207

269 752. International Politics of South Asia. (3). Consideration of regional problems of the South Asian area and international roles and foreign policies of South Asian states. 269-752-0-2207

269 753. International Politics of the Middle East. (3). 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. 269-753-0-2207

269 754. 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. 269-754-0-2207

POLITICAL THOUGHT

269 761. Political Thought: Classical to 16th Century. (3). Systematic study of ideas about law, politics, and government of great philosophers of Western civilization from Greek antiquity to the 16th century. 269-761-0-2207

269 763. Political Thought: Since the 16th Century. (3). Study of the development of Western political thought from the 16th century to the 20th century. 269-763-0-2207

269 767. American Political Thought. (3). Political ideas underlying the American union, including the doctrine of rights, the nature of union, liberty, property, and democracy. 269-767-0-2207

269 771. Modern Political Thought. (3). Study of contemporary political ideas and social thought. 269-771-0-2207

269 775. Religion and Politics. (3). The history, theory, and development of church-state relationships in the United States. A theoretic and legal analysis of the relationship. 269-775-0-2207

269 776. 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. 269-776-0-2207

READINGS AND PROBLEMS

269 784. Internship in Government, Public Administration, and Politics. (1-3). Supervised field work at the international, national, state and local level 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. 269-784-3-2207

269 785. Readings in Political Science. (1-3). Students will undertake directed reading and discussion of a selected topic in political science. 269-785-3-2207

269 790. Problems in Political Science. (1-3). Students will complete a research project and prepare an original paper under the supervision of a faculty member. Pr.: Consent of the instructor. 269-790-3-2207

269 791. Topics in Political Science. (3) I, II. Extensive exploration of a specific problem in the areas of Political Thought, American Government, Comparative Politics, International Relations and Public Administration. May be repeated for a total of Six hours in two sub-fields. Since topics will cover different areas in political science, prerequisites will be determined by the department as appropriate when the course is offered. 269-791-0-2207

269 799. Pro-Seminar in Political Science. (3). 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. 269-799-0-2207

Graduate Credit

269 800. 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. Required of all graduate students in political science. 269-800-0-2207

269 801. Advanced Research Methods I: Research Design. (3). Analysis of the different types of research designs used by political scientists. Pr.: Stat. 703. 269-801-0-2207

269 802. Advanced Research Methods II: Data Analysis. (3). A variety of applied statistical techniques employed by political scientists. Pr.: Stat. 703. 269-802-0-2207

269 804. Seminar: Public Policy and Decision Making. (3). 269-804-0-2207

269 805. Seminar: American Government Problems. (3). 269-805-0-2207

269 811. Seminar: International Politics. (3). 269-811-0-2207

269 813. Seminar: International Political Communication. (3). 269-813-0-2207

269 821. Seminar: Political Thought. (3). 269-821-0-2207
269 831. Seminar: Public Administration. (3). 269-831-0-2207
269 841. Seminar: Comparative Politics. (3). 269-841-0-2207
269 842. Seminar: Comparative Ideologies. (3). 269-842-0-2207
269 845. Seminar: South Asian Politics. (3). 269-845-0-2207
269 851. Seminar: Public Law. (3). 269-851-0-2207
269 861. Seminar: Political Organization and Behavior. (3). 269-861-0-2207
269 898. Master's Report. (2). 269-898-4-2207
269 899. Master's Thesis. (6). 269-899-4-2207

PSYCHOLOGY

E. Jerry Phares, Head of Department*

Professors Cowan,* Danskin,* Griffitt,* Hoyt,* Mitchell,* Perkins,* Phares,* Rappoport,* Rohles,* Samelson,* Sinnett,* and Thompson;* Associate Professors Frieman,* Shanteau,* and Uhlarik;* Assistant Professors Barnett,* Bauer,* Harris,* Matthews,* and Saal.* Emeritus: Professor Langford.

Undergraduate Study

The undergraduate program at Kansas State University is designed to serve the needs of several different types of students. It is a versatile program which is composed of a common core for all students. Beyond this comon core, however, students may choose among several paths depending upon their more specific interests and goals.

The psychology curriculum is arranged with several functions in mind: (1) to give the student, as a part of a liberal education, some familiarity with the principles, methods, and findings of psychology; (2) to provide knowledge and skills requisite for advanced study at the graduate level; (3) to offer valuable background for students preparing to work in a variety of professions and jobs, such as medicine, law, theology, business, teaching, engineering, etc.; (4) to provide academic work that will prepare the students to pursue a career as a psychological technician in such facilities as mental hospitals, mental health agencies, community agencies, psychological research laboratories, etc.

The Core. The undergraduate major requires Stat. 330 and an additional 22 hours of course work, including Psych. 110, 250, and either Psych. 460, 475, or 480, and either Psych. 605 or 620. An additional 9 hours of psychology electives should be chosen in consultation with the student's adviser. A no-credit orientation, Psych. 015, also is required.

The foregoing core of 25 hours constitutes the minimum psychology major. This, along with fulfillment of the general College of Arts and Sciences requirements, will enable students to obtain either the B.S. or B.A. degree, depending upon their interests and goals.

The General Education Option. For students interested mainly in a liberal education the above core program will be sufficient. In consultation with their adviser, they may wish to choose several other psychology courses beyond the required 25-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 25 required hours, additional course work is entirely a discretionary matter.

Students interested in teaching or guidance-counseling work in the schools should prepare for teacher certification with a major in psychology. Such students must consult with advisers in the College of Education.

The Graduate Study 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.

Therefore, undergraduates who anticipate pursuing a Ph.D. in psychology should take the following courses (the core of 25 hours is contained within the following recommendations): Stat. 330, Math. 501, Comp. Sci. 200 and 201, Psych. 110, 250, 460-61, 475-76, 480-81, 505, 570, 605, 620-21, and 775. Depending upon their more specialized goals, students may wish also to take Psych. 585, 616, 575, etc. Students oriented toward physiological psychology will want to ensure they also have appropriate background in biology, chemistry, etc. These matters should be worked out in consultation with an adviser. It is also strongly recommended that students gain reseach experience by working on projects under faculty supervision.

The 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 (e.g. Mental hospitals, clinics, industry, business, government) and carries out duties that are supportive of the Ph.D. psychologist. In a clinical setting the psychological technician often assists in such activities as testing, behavior change, community organization, agency management (budgets, referrals, scheduling), research, data collection and statistical analysis, etc. In the industrial setting the psychological technician often assists in personnel selection, performance appraisal, training and leadership functions, research into such matters as work motivation, job satisfaction, social behavior within organizations, etc.

Technicians are playing an increasing role in both clinical-institutional and industrial 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, government, etc. should find attractive.

Since 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 25 hours is required for both the clinical and industrial emphasis. In addition, for the clinical emphasis the following courses are re-

quired: Psych. 440, 505, 585, 586, and 587.For the industrial emphasis the following additional courses are required: Psych. 440, 560, 561, and 587. Other recommended courses for both the clinical and industrial emphasis will depend on student interests and will be worked out in consultation with a psychological technician adviser. 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 as regards the exact number of hours (Psych. 587) and the location (hospital, agency, research laboratory, etc.).

Graduate Study

Professional training in psychology is obtained in graduate programs of study leading to the M.S. and Ph.D. degrees.

At KSU, doctoral programs are offered in several broad areas. These are: (1) Animal Learning-Physiological Psychology (with concentration in: animal learning and behavior, or physiological psychology); (2) Information Processing (with concentration in: Human learning and memory, psycholinguistics, human judgement, or perception-sensation); (3) Social-Personality (with concentration in: social psychology, personality, development psychology or industrial psychology).

At the master's level, students may specialize in most of the traditional areas of psychology. However, primary emphasis is placed on work leading to the doctoral degree. Students who complete the doctoral program are thus 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, 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 can 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

Undergraduate Credit

273 015. Orientation to Psychology. (0) I. To acquaint psychology majors with psychology as a profession, and with the various options available to them at various levels of training. Discussion of professional, research, and educational methods and objectives in psychology. Should be taken during second semester of sophomore year or first semester of junior year. 273-015-0-2099

273 110. General Psychology. (3) I, II, S. An introduction to the study of behavior, with emphasis on human behavior. A survey of the methods, data, and principles of psychology. 273-110-0-2001

273 115. General Psychology (Honors). (4) I, II, S. An introduction to the study of behavior. Pr.: Participation in Honors Program. 273-115-0-2001

273 200. Applications of Research to Human Behavior. (2) Interim Sem. Applications and evaluation of psychological research findings in such areas as education, psychotherapy, psychopathology, child rearing, etc. Pr.: Psych. 110. 273-200-0-2001

273 202. Drugs and Behavior. (2) 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. 273-202-0-2001

273 250. Experimental Methods in Psychology. (4). Laboratory investigation of learning, motivation, social- personality processes, and perception and sensation. Includes two hours rec. and four hours lab. per week. Pr.: Psych. 110. 273-250-1-2002

273 280. Psychology of Childhood and Adolescence. (3). Survey of behavioral development from birth through adolescence. Pr.: Sophomore standing; Psych. 110. 273-280-0-2009

273 290. Innovative Studies in Psychology. (1-6) I, II. Topics selected in consultation with the instructor. To be used for interdisciplinary and innovative approaches to psychological topics. Pr.: Consent of instructor. 273-290-2-2001

273 399. Honors Seminar in Psychology. (3) II. Selected topics. Open to non-majors in the Honors Program. 273-399-0-4900

273 400. Personalized Instruction in General Psychology. (1-3) I, II. 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.: Psych. 110. 273-400-2-2001

273 425. Problem Solving and Decision Making. (3). I. 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.: 273-110. 273-425-0-2099

273 440. Psychology of Individual Differences. (3) I. Introduction to principles and methods of psychological testing; discussion of problems and findings in the study of individual and group difference in behavior; role of biological and social factors. Pr.: Psych. 110. 273-440-0-2006

273 460. Information Processing and Memory. (3). A survey of the manner in which people extract and utilize 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. 250. 273-460-0-2002

273 461. Laboratory in Cognitive Processes. (1) I. May be taken only in conjunction with Psych. 460. Supervised experimentation in cognitive processes. Pr.: Conc. enrollment in Psych. 460. 273-461-1-2002

273 475. Principles of Learning and Motivation. (3) Introduction to the study of learning and motivation in both animals and humans. Pr.: Psych. 250. 273-475-0-2002

273 476. Laboratory in Learning and Motivation. (1) May be taken only in conjunction with Psych. 475. Supervised experimentation in learning. Pr.: Conc. enrollment in Psych. 475. 273-476-1-2002

273 480. Fundamentals of Perception and Sensation. (3) I. Empirical and theoretical approaches to phenomena of sensation and perception. Pr.: Psych. 250. 273-480-0-2002

273 481. Laboratory in Perception and Sensation. (1) I. May be taken only in conjunction with Psych. 480. Supervised experimentation in perception and sensation. Pr.: Conc. enrollment in Psych. 480. 273-481-1-2002

273 499. Senior Honors Thesis. (2) I, II S. Open only to seniors in the Arts and Sciences Honors Program. 273-499-4-2000

Undergraduate And Graduate Credit In Minor Field

273 505. Abnormal Psychology. (3). An introductory study of behavior pathologies, with emphasis on their etiology and treatment. Pr.: Junior standing; Psych. 110. 273-505-0-2099

273 510. Introduction to Behavior Modification. (3) I, II. 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. 273-510-0-2003.

273 515. Children's Play and Make-Believe. Intersession. Theories and research concerning the role of play and make-believe in various aspects of the child's psychological development. Pr.: Psych. 110. 273-515-0-2009

273 520. Life-Span Personality Development. (3) I, II, 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 through-out life, and problems of aging. Pr.: Psych. 110; sophomore standing. 273-520-0-2009

273 535. Social Psychology. (3). Psychology of the individual in society: social attitudes and behavior (e.g., voting, prejudice), their measurement, development and change in relation to individual personality and social influence. Pr.: Psych. 110. 273-535-0-2009

273 540. Psychology of Women. (3) II. 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. 273-540-0-2099

273 545. Consumer Psychology. (3) II. 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. 273-545-0-2008

273 550. Group Dynamics. (3). Behavior in small groups, including a consideration of communication, the development of standards, the effect of pressures, the characteristics of leadership. Pr.: Six hours in psychology. 273-550-0-2005

273 560. Industrial Psychology. (3). II. Survey of human behavior and psychological principles in an industrial/organizational context. Topics include: personnel selection, performance appraisal, work motivation, job satisfaction, training, leadership, and social behavior within organizations. Pr.: 273-110. 273-560-0-2008

273 561. Laboratory in Industrial Psychology. (2) II. Supervised experience in various personnel psychology functions such as job analysis, personnel selection, performance appraisal, etc. Pr.: Psych. 560 or conc. enrollment. 273-561-1-2008.

273 565. Psychology of Aesthetics. (3). An approach to aesthetics which deals with the contributions of psychology to the study of aesthetic judgment and the formation of values. Pr.: Sophomore standing, Psych. 110. 273-565-0-2001

273 570. Psychobiology. (3). Human and animal behavior from viewpoints of psychology, physiology, and zoology. Includes neurophysiology, control of behavior by simple "brains," homeostasis in mammals, and the regulation of behavior by internal and external events. Pr.: Biol. 198, Psych. 110. 273-570-0-2010

273 575. Environmental Psychology. (3) I. Introduction to the study of man's behavior in relation to his physical setting. Definitions of man-environment system, behavior settings, methods of environmental research, and assessment of behavior in residential, school, hospital, office, and leisure environments; decision making, planning, and design. Pr.: Psych. 110 and six additional hours of psychology. 273-575-0-2008

273 580. Psychology of Sexual Behavior. (3) II. 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. 273-580-0-2005

273 585. Basic Concepts in Clinical Psychology. (3) I. 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. 250 and 505. 273-585-0-2003

273 586. Laboratory in Clinical Concepts. (2) I. 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. 273-586-1-2003

273 587. Field Placement. (1-6) I, II, 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 Psych. Tech. training committee. 273-587-2003.

273 590. Experimental Psychology Seminar. (2-3). Intensive discussion of selected topics. May be repeated. Pr.: Either Psych. 460, 475, or 480. 273-590-0-2002

273 595. Personality-Social Seminar. (2-3). Intensive discussion of selected topics. May be repeated. Pr.: Either Psych. 605 or 620. 273-595-0-2003

Undergraduate And Graduate Credit

273 605. Foundations of Social Behavior. (3) II. Selected empirical and theoretical approaches to such areas as attitudes, social influence, and the social bases of human behavior. Pr.: Psych. 535 and either Psych. 460, 475 or 480. 273-605-0-2005

273 606. Laboratory in Social Behavior. (1) II. May be taken only in conjunction with Psych. 605. Supervised research in social behavior phenomena. Pr.: Conc. enrollment in Psych. 605. 273-606-1-2005

273 616. Comparative Psychology. (3). Behavior at different phylogenetic levels as an aid to the clarification of behavioral principles. Pr.: Consent of instructor. 273-616-0-2010

273 620. Psychology of Personality. (3). Discussion of different approaches to the study of personality. Pr.: Any of the following: either Psych. 460, 475 or 480. 273-620-0-2099

273 621. Laboratory in Personality Research. (1). May be taken only in conjunction with Psych. 620. Supervised research in personality phenomena. Pr.: Conc. enrollment in Psych. 620. 273-621-1-2099

273 622. 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 Educ. 405 215. 273-622-0-2009

273 625. Engineering Psychology. (3). The role of behavioral factors in the design and operation of machines and equipment. Pr.: Psych. 110, Stat. 330 or 707. 273-625-0-2008

273 710. Methods and Theory in Psychohistory. (3). Reviews the origins of psychohistory in works by Freud and Neo-Freudians such as Erikson and Lifton. Major focus is on the emerging methods and theories as they are being elaborated in such problem areas as psychobiography, history of childhood, and larger group process studies. Primarily for graduate students in psychology and history and for selected advanced undergraduates. Pr.: Consent of instructor. 273-710-0-2005

273 715. 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.: 273-110 or 200-315 and Junior standing. 273-715-0-2009

273 750. Psychology of Language. (3). 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 250. 213-750-0-2002

273 775. History of Current Trends. (3). 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 nine additional hours of psychology; senior standing. 273-775-0-2001

273 790. Topics in Psychology. (Var.) I, II, S. Pr.: Psych. 110 and consent of instructor. 273-790-3-2001

273 799. Problems in Psychology. (Var.) I, II, S. Pr.: Psych. 110 and consent of instructor. 273-799-3-2001

Graduate Credit

273 801. 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. 250 or equiv. 273-801-0-2002

273 802. Quantitative Methods in Psychology. (3). Examination of the nature of statistical inference in psychological research: hypothesis testing and statistical estimation, including a survey of non-parametric methods; consideration of correlational techniques useful with different kinds of psychological data. Pr.: Stat. 330 or equiv. 273-802-0-2007

273 803. Introduction to Physiological Psychology. (3). A survey of basic concepts and experiments in the study of physiological correlates of behavior, including sensory and motor processes, learning, motivation and emotion. Pr.: Biol. 198 and Psych. 110. 273-803-0-2010

273 804. Laboratory in Physiological Psychology. (1). May be taken only in conjunction with Psych. 803. Supervised research in physiological correlates of behavior. Pr.: Conc. enrollment in Psych. 803. 273-804-1-2010

273 805. Experimental Design in Psychology. (3). Introduction to techniques of research planning and experimental design, including critical evaluation of selected experiments. Pr.: Psych. 802. 273-805-0-2007

273 806. Psychological Measurement. (3). 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. 273-806-0-2006

273 810. Motivation and Learning. (3). Experimental study of learning and motivation, with emphasis on recent developments in the field. Pr.: Psych 250 or equiv. 273-810-0-2002

273 812. Perception. (3). 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. 250 or equiv. 273-812-0-2002

273 814. Human Learning and Retention. (3). Analysis of processes involved in human learning, transfer and retention, with emphasis on current developments in the field. Pr.: Psych. 250 or equiv. 273-814-0-2002

273 820. Personality Theory and Research. (3). A comparative examination of contemporary theories of personality as well as research findngs relevant to such theories. Pr.: Psych. 620 or equiv. 273-820-0-2099

273 825. Judgmental Processes. (3). Examination of empirical findings and theoretical approaches to decision making and judgment with emphasis on higher cognitive processes. Pr.: Psych. 250 and 802. 273-825-0-2002

273 830. Pro-Seminar in Social Psychology. (3). 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. 273-830-0-2005

273 860. Practicum in Counseling Psychology. (Var.) Supervised practical experience in counseling. Pr.: Consent of instructor. 273-860-2-2004

273 875. Industrial Psychology: Personnel Training. (3) II. An examination of the training of personnel in an organization. Relevant 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.: 273-560 or equivalent. 273-875-0-2008

273 899. Research in Psychology (M.S.). (Var.) Pr.: Consent of supervisory committee. 273-899-4-2001

273 908. Advanced Physiological Psychology. (3). A study of the neural and endocrinological correlates of behavior. Pr.: Psych. 803. 273-908-0-2010

273 909. Sensory Processes. (3). Experimental study of sensory and perceptual processes, with emphasis on recent developments in the field. Pr.: Psych. 250 or equiv. 273-909-0-2002

273 911. Vision. (3). Principal facts of space and color perception, with emphasis on specification and measurement of stimulus conditions; the constancies; elementary principles of refraction; color blindness and other visual anomalies. Lectures and demonstrations. Pr.: Psych. 250 or 909. 273-911-0-2010

273 915. Experimental Analysis of Behavior. (3) Every other year or on sufficient demand. The use of operant conditioning techniques in the study of sensory processes, chaining, stimulus control and punishment; applications to psychopharmacol , unusual environments, and psychotherapy. Pr.: Psych. 810. 273-915-0-2002

273 919. Advanced Measurement. (3). The logic of measurement, scaling theory, psychophysics and psychometrics, and problems in classification and prediction. Pr.: Psych. 806. 273-919-0-2006

273 921. Experimental Study of Personality. (3). Analysis and discussion of experimental results in personality research, particularly as they relate to theories of personality. Empirical work in such areas as anxiety, defense mechanisms, perception, needs, and development will be covered. Pr.: Psych. 820. 273-921-0-2099

273 922. Psychopathology. (3). A systematic review of behavior disorders, their etiology and treatment. Pr.: Psych. 505 and 620. 273-922-0-2099

273 925. Psychological Development of Children. (3). Analysis of theoretical and empirical approaches to the study of psychological child development. Includes representative approaches such as cognitive-developmental, S-R, and psychoanalytic. Pr.: Psych. 280 or equiv. 273-925-0-2009

273 931. Advanced Social Psychology. (3). Intensive examination of the social determinants of behavior, with emphasis upon problems of current professional interest. May be repeated. Pr.: Psych. 830. 273-931-0-2005

273 951. Seminar in Physiological Psychology. (1-3). Selected topics in physiological psychology. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. 273-951-0-2010

273 952. Seminar in Sensory Processes. (1-3). Selected topics in sensory psychology. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. 273-952-0-2002

273 953. 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. 273-953-0-2099

273 954. Seminar in Experimental Psychology. (Var.) Inte ve 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 909, or consent of instructor. 273-954-0-2002

273 955. Seminar in Animal Behavior. (1-3). Discussion of selected topics of current experimental interest in the areas of animal learning and/or comparative psychology. May be repeated with vonsent of supervisory committee. Pr.: Consent of instructor. 273-955-0-2002

273 956. 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. 273-956-0-2006

273 957. 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. 273-957-0-2002

273 958. 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. 273-958-2-2001

273 959. 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. 273-959-0-2005

273 968. 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. 273-968-0-2001

273 970. Seminar in Human Performance. (1-3). Discussion of current professional problems in psychology. May be repeated with consent of supervisory committee. Pr.: Consent of instructor. 273-970-0-2008

273 990. Internship in Psychology. (Var.) Pr.: Consent of the supervisory committee. 273-990-2-2001

273 999. Research in Psychology (Ph.D). (Var.) Pr.: Consent of supervisory committee. 273-999-4-2001

SOCIOLOGY, ANTHROPOLOGY AND SOCIAL WORK

Eugene A. Friedmann, Head of Department*

Professors Friedmann,* O'Brien,* Rohrer,* and Schnur;* Associate Professors Finnegan,* C. Flora,* O'Brien,* Orbach,* M. Ottenheimer,* Peters,* and Taylor;* Assistant Professors Benson, Brede, Camp,* Cross,* Dushkin,* J. Flora,* Harris,* Jackson, Mariampolski, Miley,* H. Ottenheimer,* M. Ottenheimer,* and Pelletier; Instructors Kaiser.

The Department of Sociology, Anthropology and Social Work offers four separate undergraduate majors: 1) general sociology; 2) sociology/corrections; 3) anthropology and 4) social work. 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. M.A. programs are offered in general sociology and in sociology/corrections option. The Department also offers a Ph.D. program in Sociology with a specialization in the areas of community and rural organization and social change and development. Descriptions of the specific undergraduate majors and graduate programs are given below.

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.

The trained sociologist is prepared for professional work in social research, teaching, community and government planning and service agencies, and corrections and law enforcement careers. It is also a desirable background, as either a sole or a combined major, for further professional training in law, city planning, public administration, hospital administration, as well as for advanced graduate work in sociology or other of the social sciences.

The Undergraduate Program. Students who desire to major in sociology should refer to the general requirements for the B.A. or B.S. degree (see page 101). There is a choice of two majors in the undergraduate sociology program: (1) general sociology; or (2) correctional administration. The student interested in sociology who desires to teach in secondary schools should prepare for teacher certification with a major in sociology (see page 208).

Students enrolled in general sociology will be required to take 28 semester hours of sociology to include Soc. 211, 511 and 520. In addition to the other requirements nine hours of electives in sociology are to be taken at the 500 level or above, and an additional nine hours are required at the 600 level and above.

Students enrolled in correctional administration will be required to take 31 semester hours of sociology to include Soc. 211, 511, 520, 661, 762 and two of the following: Soc. 660, 763, 764, 765, or 766. These courses are intended to help people prepare for a variety of correctional positions concerned with

integrating and reintegrating law violators into society. These positions include, among others: probation and parole officer, prison classification officers, reformatory counselors, juvenile institution case managers, probation and parole supervisors, regional and state directors of probation and parole, parole board members, community correction center positions, institutional supervisors and program directors, deputy and associate wardens, superintendents, wardens, directors and commissioners of state correctional systems, teachers, and researchers.

The Graduate Program. The graduate programs in sociology provide the student with the opportunity to develop skills and interests in specific areas of focus 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 full range of sociological specialties and a broad sociological background. It is primarily intended to prepare students who want to continue into Ph.D. programs. However, it may also be designed for students who want to teach in community colleges or work in areas of applied research.

The M.A. in sociology with a correctional administration option offers a balanced program of basic and applied sociological studies for those preparing for professional careers in correctional administration.

The Ph.D. program offers specialized training in community and rural organization, societal change and development, sociological theory, and research methods. Additional training is provided in demography and human ecology, deviant behavior, social psychology, and social organization. Graduates will be prepared for academic teaching and research careers as well as for applied social research.

Sociology students may draw upon related graduate programs in computer science, statistics, and various social and behavioral sciences in designing individual programs of study. Special University programs in the economics of development, regional and community studies, and South Asian studies may be relevant for specific objectives. An IBM 370 and a computing center with a full range of facilities and services is available to graduate students. Reseach facilities in the Department of Sociology, Anthropology and Social Work include a population research laboratory, a community studies laboratory, and a statistical laboratory.

For the major in social work see page 189.
For the major in anthropology see page 187.

Courses in Sociology

Undergraduate Credit

277 211. Introduction to Sociology. (3) I, II, S. Development, structure, and functioning of human groups; social and cultural patterns; and the principal social processes. 277-211-0-2208

277 214. Introduction to Sociology. H (4) I, II. Development, structure and functioning of human groups; societal and cultural patterns; the nature of sociological inquiry. Lecture, discussion and independent study. 277-214-0-2208

277 301. Topics in Sociology. (3). Supervised independent and/or interdisciplinary study projects. Pr.: Soc. 211 and consent of instructor. 277-301-0-2208

277 399. Honors Seminar in Sociology. (1-3) I 1979. Readings and discussion of selected topics. Open to nonmajors in the Honors Program. 277-399-3-4900

277 411. Social Problems. (3) I, II, some S. Problems of personal and social disorganization, such as adolescence, juvenile delinquency, crime, mental illness, unemployment, and family instability; methods of prevention and treatment. Pr.: Soc. 211. 277-411-0-2208

277 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 277-499-4-2208

Undergraduate And Graduate Credit In Minor Field

277 501. 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. 277-501-0-2208

277 505. Introduction to the Civilizations of South Asia I. (3) I. Interdisciplinary survey of the development of civilizations in South Asia; geographical and demographic context; philosophical and social concepts; social and political institutions, literature and historical movements. (Same as Hist. 505, Geog. 505, P. Sci. 505, Anthro. 505.) Pr.: Soc. 211. 277-505-0-2208

277 506. Introduction to the Civilizations of South Asia II. (3). Interdisciplinary survey of recent and contemporary civilizations in India, Pakistan, Ceylon, Nepal, and Afghanistan, including literature, geography, social and political structure, ideas. (Same as Hist, 506, Econ. 506, P. Sci. 506, Anthro. 506.) Pr.: Soc. 211. 277-506-0-2208

277 510. Social Welfare as a Social Institution. (3). 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 SW 510.) Pr.: Soc. 211. 227-510-0-2208

277 511. Comparative Social Theories. (3). Investigations of a range of current sociological theories concerning the socialization process, group behavior and social organization. Pr.: Soc. 211. 277-511-0-2208

277 520. Methods of Social Research I. (4). 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.: Soc. 211, Stat. 330 or equiv. To include one credit hour of laboratory and field research experience. 277-520-1-2208

277 530. Population and Human Ecology. (3). Theories, policies, growth, composition, spatial aspects, movements, and world population trends. Pr.: Soc. 211. 277-530-0-2208

277 531. Urban Sociology. (3). 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.: Soc. 211. 277-531-0-2208

277 532. Community Organization and Leadership. (3). American community organization; special emphasis on community problems and planning. Pr: Soc. 211. 277-532-0-2208

277 533. Sociology of Agricultural Organization in the U.S. (3) II. Social impact of agricultural change in U.S.; emphasis on land tenure, farmers; social movements, role of agricultural technology and relationship of agriculture to rest of society. Pr.: Soc. 211. 277-533-0-2208

277 540. Social Organization. (3). Principles and processes of the organization and structure of human societies. Analysis of social groups and institutions and theories of social structure. Pr.: Soc. 211. 277-540-0-2208

277 541. Wealth, Power and Privilege. (3) II in odd numbered years. Resources and rewads in American society. Various explanations of the causes, persistence, and effects of inequality in American life. discussion of social mobility and current issues. Pr.: 277-211. 277-542-0-2208

277 542. The Social Organization of the Future. (3). 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.: Soc. 211. 277-542-0-2208

277 545. The Sociology of Women. (3). The position of women in the United States and cross-culturally is studied empirically and in theoretical perspective; analysis of social structural inputs to female status; examination of socialization and sex roles. Pr.: Soc. 211. 277-545-0-2208

277 550. Group Processes and Social Behavior. (3) I, II. Analysis of processes of group formation, maintenance and change and their interrelationships with individual social behavior. Consideration of major theoretical approaches and their empirical foundations. Pr.: Soc. 211. 277-550-0-2208

277 565. Program and Policy Formulation and Analysis. (3). 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 legislative action. (Same as SW 565.) Pr.: Soc. 260, 510. 277-565-0-2104

277 570. Race and Ethnic Relations in the U.S.A. (3). Racial and cultural groups; attitudes, prejudices, conflicts; approaches to understanding race and minority group relations in the U.S.A. Pr.: Soc. 211. 277-570-0-2208 (Same as 277 618)

277 590. Senior Seminar in Sociology. (3) I. Integration of courses in sociology. Pr.: Soc. 211. 277-590-0-2208

277 618. Religion in Culture. (3). The nature of religion in nonliterate and peasant societies, and its manifestations in different cultural systems. (Same as Anthro. 618.) Pr.: Anthro. 200 or Soc. 211. 277-618-0-2208

277 630. Seminar in Applied Sociology.(4) II. A critical examination of the interchange between selected sociological perspectives. Specific emphasis is placed upon decisions-making and the exercise of power as these apply to selected social issues. Pr.: 277-511 and 277-520. 277-630-0-2208.

277 640. 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.: Soc. 211. 277-640-0-2208

277 660. Juvenile Delinquency. (3). Nature, extent, and causes of delinquency; characteristics of delinquents; means of prevention and treatment. Pr.: Soc. 211. 277-660-0-2209

277 661. Criminology. (3) I, II. Nature, extent, and causes of crime; programs for prevention and treatment. Pr.: Soc. 211. 277-661-0-2209

Graduate And Undergraduate Credit

277 701. Problems in Sociology. (Var.) I, II, S. Pr.: Soc. 211 and junior standing. 277-701-3-2208

277 702. Political Sociology. (3). An introduction to the principles of political sociology. Theories of politics and society. 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 Pol. Sci. 702.) Pr.: Soc. 211, Pol. Sci. 110. 277-702-0-2208

277 709. Development of Social Thought. (3). 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.: Soc. 211. 277-709-0-2208

277 710. Systematic Analysis of Social Theory. (3). Examination of contemporary sociological theory with reference to the nature of scientific explanation and the function of scientific theory. Critical study and analysis of selected social theorists and types of social theory with the objective of clarifying the conceptual and logical structure of underlying theoretical models and their assumptions about man and society. Pr.: Soc. 511 or equiv. 277-710-0-2208

277 722. Specialized Techniques of Social Research. (3). 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.: Soc. 211 and 721 or equiv. 277-722-0-2208

277 724. Qualitative Methodology. (3) II. 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 placed upon formulation of problems and the execution of research. Pr.: 277-520 and 285-702 or equivalent. 277-724-2-2208

277-725. Intermediate Quantitative Methods. (3) I. Treatment of current sociological research techniques and applications. Examines the logic and strategy of sociological analysis. Considers problems of conceptualization and construction of research instruments, the presentation and analysis of data in tabular and graphic form, and the selection and application of standard techniques for data analysis. Pr.: 277-520 and 285-702 or equivalent. 277-125-1-2208

277 730. Methods of Demographic Analysis. (3). Procedures and techniques for the collection, evaluation and analysis of demographic data, measures of population composition and of fertility, mortality and migration. Construction of life tables; population estimates and forecasts. Pr.: Soc. 211. 277-730-1-2208

277 732. Community Change. (3) II. A variable content course which in any given semester will deal with one of the following topics: community powers structur; applied community change; sociology of communes, utopias, and intentional communities; or rural community structure. May be repeated twice. Pr.: 277-532 or equivalent. 277-732-0-2208

277 735. Human Ecology. (3). 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.: Soc. 211 and consent of instructor. 277-735-0-2208

277 740. Comparative Social Systems. (3). Comparison of social systems in the Orient, Middle East, Europe, and the Americas. Pr.: Soc. 211. 277-740-0-2208

277 741. Social Differentiation and Stratification. (3). Analysis of societal organization based on age, sex, residence, occupation, community, class, caste, and race. Pr.: Soc. 211. 277-741-0-2208

277 742. South Asian Social Systems. (3). Survey of contemporary research and analysis of family and caste structures, demography, mobility, urbanization and modernization in India and Pakistan. Focus on social change: intentions, methods, consequences. Pr.: Soc. 211 or Anthro. 200 and either Soc. 505, Anthro. 505 or Anthro. 645, or consent of instructor. 277-742-0-2209

277 744. Social Gerontology: An Introduction to the Sociology of Aging. (3). 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.: Soc. 211. 277-744-0-2208

277 745. Sociology of Sport. (3) I, II. A critical analysis of sport and leisure activity in contemporary American society focusing on such issues as sport participation and social mobility, race and sports, women and sports, and audience involvement. Pr.: Soc. 211 or consent of instructor. (Cross-listed as 261 745.) 277-745-0-2208

277 746. The Sociology of Formal Organizations. (3). The nature and types of formal and complex organizations; the connections between them and of their societies; and selected aspects of their internal structure, such as peer group and hierarchial relations in organizations, processes of communication, management, and impersonal mechanisms of control. Studies a variety of formal organizations with particular emphasis upon industrial, educational, and governmental organizations. Pr.: Soc. 211. 277-746-0-2208

277 747. Sociology of Work. (3). The social nature of work and related phonomena; occupational structures; career lines; adjustment and interpersonal relations at work; significance of work in the life cycle. Pr.: Soc. 211. 277-747-0-2208

277 750. Social Control. (3). Analysis of social and institutional processes and mechanisms of social control: socialization, role allocation, systems of social sanctioning, growth and dynamics of institutional systems of social control. Theoretical approaches to social control emphasizing its character at the institutional and societal level of analysis. Pr.: Soc. 211. 277-750-0-2208

277 751. Social Change. (3) I in even 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.: Soc. 211. 277-751-0-2208

277 752. Social Roles and Social Relationships. (3). 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.: Soc. 211 and 550. 277-752-0-2208

277 753. Sociology of Mass Cmmmunications. (3). Social organization and change as influenced by the control, structure, and function of mass communications. Pr.: Soc. 211. 277-753-0-2208

277 762. Correctional Communities and Their Administration. (3). The world of the prisoner; an analysis of the society of captives and their captors within the total correctional process. Pr.: Soc. 211. 277-762-0-2105

277 763. Classification, Training and Treatment in Correctional Institutions. (3). The organization and delivery of classification, training, and treatment services in prisons, reformatories, and other correctional institutions. Evaluation of the impact of these services upon subsequent criminal behavior. Pr.: Soc. 211 and 762 or consent of instructor. 277-763-0-2105

277 764. Security, Custody and Discipline in Correctional Institutions. (3). Analysis of the maintenance of security, custody, and discipline in prisons, reformatories, and other correctional institutions. Purpose, principles, definitions, problems and the role of social control in institutions. Implications for the integration and reintegration of law violators. Pr.: Soc. 211 and 762 or consent of instructor. 277-764-0-2105

277 765. Correctional Treatment Practices. (3). Theories and methods for treatment of delinquents and criminals. Social and cultural variables affecting treatment. Evaluation of treatment effectiveness. Pr.: Soc. 211 and 762 or consent of instructor. 277-765-0-2105

277 766. Probation and Parole. (3). Probation and parole systems; roles of judges, parole board members, and professional personnel; criteria for parole selection and evaluation of success; attitudes toward probation and parole. Pr.: Soc. 211 and 762 or consent of instructor. 277-766-0-2105

277 767. 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.: Soc. 411 and consent of instructor. 277-767-0-2208

277 770. Sociology of Dominant-Minority Relations. (1-3). Advanced sociological views of race or ethnic relations in industrialized societies; comparative, evolving and contemporary perspectives on dominant-minority relations. Pr.: Soc. 211 and consent of instructor. 277-770-0-2209

Graduate Credit Only

277 898. Master's Report Research. (Var.) I, II, S. 277-898-4-2208

277 899. Master's Thesis Research. (Var.) I, II, S. 277-899-4-2208

277 911. Seminar in Sociological Theory. (3). Contemporary sociological theory as systems of explanation of social phenomena and as bases for empirical research. Particular attention given to problems of conceptualization, system building and verification. Pr.: Soc. 511 and 710 or equiv. 277-911-0-2208

277 912. Seminar: Theory Construction in Sociology. (3) II alt. years. An examination of alternative logical strategies in theory construction with emphasis on theory construction as a research tool. Pr.: Soc. 511 and consent of instructor. 277-912-0-2208

277 920. Seminar in Sociological Research. (3). Application of scientific techniques in the design and execution of research. Pr.: Soc. 710 or equiv. 277-920-0-2208

277 930. Seminar in Community Analysis. (3). Various aspects of the structural and functional analyses of communities: demographic, ecological, organizational, institutional. Pr.: Soc. 530 or equiv. 277-930-0-2208

277 931. Seminar in Demographic Analysis. (3). II. Demography as a professional scientific discipline with intensive analysis of demographic techniques. Pr.: Soc. 530 or equiv. 277-931-0-2208

277 932. Seminar in Rural Sociology. (3). 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.: Soc. 733 or 734 or equiv. 277-932-0-2208

277 940. Seminar in Social Organization. (3). Consideration of selected approaches to the study of societal organization, organizational theory and analysis. Pr.: Consent of instructor. 277-940-0-2208

277 943. Research in Family Organization. (3). Selected research topics in the analysis of contemporary family structures; the relations of the family to other societal systems; comparative perspectives and the use of cross-national data in family research. Pr.: Consent of instructor. 277-943-0-2208

277 944. Seminar in the Sociology of Aging. (3) I. Consideration of selected topics and issues in the sociology of aging such as retirement and institutional change, societal reactions to aging, population structure and socio-economic consequences of aging populations, the social organization of leisure, the impact on social organization of services for older pople, the structural and organizational consequences of widowhood, age-grading and stratification in aging populations, anlaysis of the impact on community structure and organization of special institutions for older people. Pr.: 277-744. 277-944-0-2208

277 950. Seminar in of Small Groups and Interaction. (3) I odd years. Longitudinal and cross-sectional analyses of the basic elements in social interaction. Pr.: Soc. 550, 752 or equiv. 277-950-0-2208

277 951. Seminar in Societal and Institutional Dynamics. (3) I or 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.: Soc. 751 or equiv. 277-951-0-2208

277 962. Seminar in Deviant Behavior and Social Disorganization. (3). Analysis in detail and depth of selected forms of deviant behavior and their relevance to social disorganization. Pr.: Consent of instructor. 277-962-0-2208

277 999. Ph.D. Dissertation Research. (Var.) 277-999-4-2208

Anthropology

Anthropology emphasizes the interdependence of man's genetically inherited and socially learned characteristics in the study of human nature. Accordingly, it is comprised of two main divisions: physical anthropology and cultural anthropology. Additionally, anthropologists base their generalizations on the most diverse possible sample of biological types and cultures, including those of nonliterate or folk peoples and those of the prehistoric past. Thus, physical anthropologists study both present-day races and the fossil remains of extinct groups; and cultural anthropologists study existing cultures of various levels of complexity as well as prehistoric cultures.

Professional anthropologists engage in teaching or research at the university level or work in applied areas such as the designing of garments or equipment for the military, identification of human remains, mental health research, public health research, consultation and research in the administration of dependent peoples, and training programs for those who work among culturally alien peoples. Those who wish to work as professional anthropologists should plan to obtain a graduate degree.

The undergraduate major is of special value for those who expect to work in technical assistance programs, foreign missionary enterprises, the diplomatic service, or in any other capacity involving dealing with culturally different persons in the United States or in other countries. It is relevant to all lines of endeavor which require an understanding of how human cultures function, for example, social work, religious ministry, counseling, personnel administration, teaching, and industrial relations.

Course work is available in five areas: ethnology (the comparative and generalizing study of culture), ethnography (the descriptive study of nonliterate or folk cultures), linguistic anthropology (the cross-cultural study of languages), archaeology (the study of prehistoric cultures), and physical anthropology (the study of man's evolution and racial variation).

The requirements for a B.A or B.S. in anthropology consist of a minimum of 27 hours in anthropology as follows:

I. Anthro. 200, 260, 280, and 660 (or equivalent courses approved by anthropology faculty).

II. Anthro. 602.

III. Twelve elective hours at or above the 500 level to be distributed among at least two of the following: 1) ethnology and ethnography, 2) linguistic anthropology, 3) archaeology, and 4) physical anthropology.

Courses In Anthropology

Undergraduate Credit

278 100. Kansas Archaeology. (2) I. A basic information course which examines the basic prehistoric cultural adaptations who lives in Kansas from man's first appearance in the State about 12,000 years ago to Kansa, Pawnee, Wichita and Plains Apache tribes at the time of Coronado's entrance in A.D. 1547. The role of Kansas archaeology in the development of American anthropology will be discussed as well as the present and potential future destruction of that heritage by land and industrial development. 278-100-0-2202

278 200. Introduction to Cultural Anthropology. (3) I, II, S. Introduction to basic anthropological concepts; technological, social and religious characteristics of nonliterate cultures. 278-200-0-2202

278 201. Introduction to Cultural Anthropology. H (4). Introduction to basic anthropological concepts; technological, social, and religious characteristics of nonliterate cultures; discussion and independent study. 278-201-0-2202

278 202. 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.: 278-200 or concurrent enrollment. 278-202-0-2202

278 260. Introduction to Archaeology. (3) I, II. History of archaeological research; survey of concepts and methods of the field and laboratory; brief outlines of the major Old and New World cultural sequences. 278-260-0-2202

278 280. Introduction to Physical Anthropology. (3) I, II. History of research; principles of evolution and human genetics; man's primate relations; fossil evidence of the evolution of man; the study of modern race; culture and evolution. 278-280-0-2202

278 399. Honors Seminar in Anthropology. (1-3) I 1979. Offered on demand. Readings and discussion of selected topics. Open to non-majors in the Honors Program. 278-399-3-4900

278 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honros program. 278-499-4-2202.

Undergraduate And Graduate Credit In Minor Field

278 501. Proficiency Development. (1-3). 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. 278-501-0-2202

278 505. Introduction to the Civilizations of South Asia I. (3). Interdisciplinary survey of the development of civilizations in South Asia; geographical and demographic context; philosophical and social concepts; social and political institutions; literature and historical movement. Pr.: Anthro. 200. (Same as Hist. 505, Geog. 505, P. Sci. 505, Soc. 505.) 278-505-0-2202

278 506. Introduction to the Civilizations of South Asia II. (3). Interdisciplinary survey of recent and contemporary civilizations in India, Pakistan, Ceylon, Nepal, and Afghanistan, including recent history, current economy, religion, culture, languages, literature, geography, social and political structure, ideas. Pr.: Anthro. 200. (Same as Hist. 506, Econ. 506, P. Sci. 506, Soc. 506.) 278-506-0-2202

278 507. Peasant Society. (3) I. A comparative approach to agrarian societies; the investigation of economic, political, social and ideological aspects of peasantry. Pr.: Sophomore standing. 278-507-0-2202

278 508. Male and Female: Crisis Cultural Perspectives. (3) II. Range and variety of sex-roles and male-female relationships, particularly in non-western cultures. Stresses sex-role complementarity within the anthropological framework of cultural relativism. Pr.: Sophomore standing. 278-508-0-2202

278 511. Cultural Ecology and Economy. (3) II. Cultural ecology and organization in non-western cultures. Discussion of environment and culture, exchange and display, money, trade and markets, and economic development and social change in selected socities. Pr.: 278-200. 278-511-0-2202

278 512. Political Organization in Folk and Nonliterate Cultures. (3) I. Anthropological approaches to politics in non-Western societies. Structural-functional, evolutionary, and conflict theories. A comparison of the political systems of small-scale and complex societies: political modernization. Pr.: Sophomore standing. 278-512-0-2202

278 515. Creativity and Culture. (3) I. How anthropologists view the expressive and creative aspects of culture. A cross-cultural survey of the verbal, visual and performing arts in non-literate societies. Pr.: Sophomore standing. 278-515-0-2202

278 519. Practical Anthropology. (3). Application of anthropological principles and insights to programs of planned change, cultural innovation and contemporary problems. Pr.: Sophomore standing. 278-519-0-2202

278 520. Senior Seminar. (3). Intensive exploration of anthropological problems for both majors and non-majors of sufficient background. High levels of individual participation. Pr.: Senior standing and nine hours of anthropology, or consent of instructor. 278-520-0-2202

278 533. Indians of Kansas. (3) II. Description and comparison of aboriginal and post-contact tribes of the prairies and plains of Kansas. Culture contact and change in surviving trives. Pr.: Sophomore standing. 278-533-0-2202

278 536. Black Cultures of the Americas. (3) II. Description and comparison of African-derived cultural patterns in the Americas, stressing culture contact and acculturation, retention and syncretism, social and economic organizaton, religion, language, the arts. Pr.: Sophomore standing. 278-536-0-2202

278 545. Cultures of Inida and Pakistan. (3) II. Cultural survey of the contemporary tribes and Hindu caste communities in their historicai 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. 278-545-0-2202

Undergraduate And Graduate Credit

278 600. Cultural Dynamics. (3). 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.: Anthro. 200 or consent of instructor. 278-600-0-2202

278 602. Anthropological Theory. (3). Review and integration of the major theoretical approaches in the principal branches of anthropology, history and contemporary methodology and theory. Pr.: Anthro. 200 or consent of instructor. 278-602-0-2202

278 604. Culture and Personality. (3). Anthropological contributions to personality study; cross-cultural comparisons of personality types, means of personality formation in nonliterate and folk cultures; culture change and personality. Pr.: Three hours of anthropology or consent of instructor. 278-604-0-2202

278 610. Social Organization in Nonliterate Cultures. (3). Families, lineages, clans, age sets, tribal fraternities, secret societies, tribes, nations, and other groups found among the world's folk peoples. Special emphasis on how these relate to human behavior. Pr.: Anthro. 200, or Soc. 211, or consent of instructor. 278-610-0-2202

278 613. Black Music of the Americas. (3) I. Music of the New World viewed in a culture-historical framework. Examination of the social conditions under which African and European music styles came into contact in the New World and the ways in which they blended to form the unique style of calypso, blues and jazz. Pr.: Anthro. 200 and Junior standing. 278-613-0-2202 Cross listed with Music.

278 616. Music and Culture. (3). Music as an aspect of human behavior. Exploration of structural and functional relationships between music and other aspects of culture. Style area survey. Pr.: Anthro. 200 or consent of instructor. 278-616-0-2202

278 618. Religion in Culture. (3). The nature of religion in nonliterate and peasant societies, and its manifestations in different cultural systems. Pr.: Anthro. 200 or Soc. 211 or consent of instructor. 278-618-0-2202 (Same as 277 618)

278 622. Special Topics in Anthropology. (3). Offered on sufficient demand. Variable topics within cultural anthropology, anthropological linguistics, archaeology, or physical anthropology. Pr.: Relevant anthropology courses or consent of instructor. 278-622-3-2202

278 625. Independent Reading and Research in Anthropology. (1-3). 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. 278-625-3-2202

278 630. Indians of North America. (3). Aboriginal cultures of Canada and the United States; culture contact and change among surviving groups. 278-630-0-2202

278 632. Indians of Middle America. (3). Description and comparison of Tarahumara, Aztec, Maya, Cuna, and other civilizations and non-literate cultures of Mexico, Central America, and the Caribbean ring. Culture contact and change in surviving tribes. 278-632-0-2202

278 634. Indian Cultures of South America. (3). A survey of the nature and variability of the aboriginal cultures of South America. Analysis of sample cultures, stressing economic, social, political, and religious structures. 278-634-0-2202

278 650. Cultures of Africa. (3). Description and comparison of the aboriginal cultures of Africa south of the Sahara. Culture contact and change. 278-650-0-2202

278 660. Linguistic Anthropology. (3). The functions of language as an aspect of culture; diversity, distribution, and dynamics of language; linguistics in anthropology. Pr.: Three hours of anthropology or consent of instructor. 278-660-0-2202

278 666. Communication and Culture. (3) I. How language, gesture and other modes of human communication reflect and are influenced by culture. Kinesics, proxemics, sociolinguistics, enthnolinguistics, structural and symbolic anthropology. Pr.: 278-660. 278-666-0-2202.

278 670. Archaeology of North America. (3). 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.: Anthro. 200, or 260, or consent of instructor. 278-670-0-2202

278 673. Precolumbian Civilizations of Mexico and Guatemala. (3). Early man, 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.: Anthro. 200, or 260, or consent of instructor. 278-673-0-2202

278 676. Archaeology of the Old World. (3). Origin and evolution of human culture and technology; the major prehistoric sequences of Asia, Africa and Europe; emphasis on period of plant and animal domestication and the European sequences. Pr.: Anthro. 200, 260, or consent of instructor. 278-676-0-2202

278 679. Archaeological Field Methods. (3). Archaeological site survey, site excavation, and laboratory analysis of sites and artifacts from the Manhattan, Kansas, region. Field work on Saturday, 8:00-5:00, while weather permits, laboratory work thereafter. Pr.: Consent of instructor. 278-679-1-2202

278 685. Race and Culture. (3). 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. 278-685-0-2202

278 688. Fossil Man and Human Evolution. (3). 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. Anthro. 200 or 280 or consent of instructor. 278-688-0-2202

278 691. Primatology. (3). 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 man in the context of the Primate Order. Pr.: Anthro. 280 or consent of instructor. 278-691-0-2202

278 694. Osteology. (3). 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.: Anthro. 280 or consent of instructor. 278-694-0-2202

278 695. Laboratory in Osteology.II. Laboratory demonstration and exercise in working with skeletal material for anlaysis of sex, age, stature, and race. Complete metric and non-metric analysis with consideration given to paleodemography, paleopathology, *insitu* analysis and excavation and preservation. Written reports on bone material remains will be necesssary. Pr.: 278-694 and consent of instructor. 278-695-1-2202

278 730. Field and Laboratory Techniques in Archaeology. (8). 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. Credit may be received twice for this course if the areas or problems involved are different. Pr.: Anthro. 200 or 260 or consent of instructor. 278-730-1-2202

278 792. Field Methods in Linguistics. (3) Offered on demand. An introduction to techniques of collecting and analyzing linguistic data in the field. Work with non-Western informants in class. Pr.: Consent of instructor. Same as Speech 792 and Mod. L. 792. 278-792-0-2202

Social Work

The social work major is intended to prepare the beginning level professional social work practitioner. The curriculum is designed to impart theoretical knowledge of individual development, group processes, and organizational behavior, and to teach a repertoire of versatile skills for problem intervention at various levels.

The undergraduate social work program is nationally accredited by the Commission on Accreditation of the Council on Social Work Education. This accreditation allows a graduate to be licensed as a Bachelor Degree Social Worker in the State of Kansas, and allows for advanced standing in many graduate programs in social work throughout the United States.

The social work undergraduate major is of particular value to those students who intend to pursue a professional career in social work upon graduation.

The student who wishes to declare a major in social work must first complete the introductory courses SW 260 and SW 510, with a 3.0 average for the two. The student must also have a general grade point average of 2.5. It is expected that the major in social work will not be declared before the end of the sophomore year.

A student completing a B.A. or B.S. in social work must successfully complete 46 hours of major courses (which includes the two introductory courses). These courses are divided into several content areas:

1) Human development and social environment content: 15 credits, in which a student must maintain a 3.0 average: Soc. 411, 550 and 531; Psych. 280 and 420

2) Social work practice content: 6 credits: SW 560 and 561

3) Research content: 4 credits: Soc. 520

4) Social Policy content: 6 credits: SW 510 and SW 565

5) Field Placement: 9 credits: SW 562

6) Professional Social Work Seminar: 3 credits: SW 564.

Courses in Social Work

279 260. Introduction to Social Work. (3). A survey of the fields of social work, the relationship of social work to other social developments and vocational opportunities. 279-260-0-2104

279 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors program. 279-499-4-2204.

279 501. Proficiency Development. (1-3). 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. For undergraduate credit only. Pr.: Consent of instructor and superior performance in relevant course. 279-501-0-2104

279 510. Social Welfare as a Social Institution. (3). 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 Soc. 510.) Pr.: Soc. 211. 279-510-0-2104

279 560. Skills and Techniques in the Practice of Social Work I. (3). Fundamental skills and techniques for social workers, emphasizing the nature of social work, engagement and communication skills, observation and information gathering skills. Pr.: Soc. 411, 550 and 531; Psych. 280 and 420. (Social Work majors only.) 279-560-0-2104

279 561. Skills and Techniques in the Practice of Social Work II. (3). Social work practice course concentrating on assessment skills and planning decisions for intervention, strategies and roles. Evaluation termination of change efforts and selected work skills such as collaboration, consultation, and supervision will be integral parts of course material. Pr.: SW 560. To be taken concurrently with SW 562. (Social Work majors only.) 279-561-0-2104

279 562. Field Experience. (1-9). Supervised field experience in community agencies and programs as a practical application of social work knowledge and skills gained from introductory courses. Emphasis on direct work with clients, whether individuals, groups or communities. Weekly seminar makes use of student's experience to analyze social work theory and practice. Pr.: SW 260, Soc. 510, SW 560. To be taken concurrently with SW 561. (Social Work majors only.) 279-562-2-2104

279 563. The Practice of Social Work in Rural Areas. (3) II. 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.: taken concurrently with 279-560 and consent of instructor. 279-563-0-2104

279 564. Social Work Professional Seminar. (3). 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 n various client systems. Pr.: To be taken concurrently with Field Experience SW 562. (Social Work majors only.) 279-564-0-2104

279 565. Program and Policy Formulation and Analysis. (3). 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 legislative action. Same as Soc. 565. Pr.: SW 260, 510. 279-565-0-2104

SPEECH

Norma D. Bunton, Head of Department*

Professors Bunton,* Dace,* and Flanagan;* Associate Professors Burke,* Climenhaga,* Fedder,* Longhurst,* Nichols,* Rainbolt,* and Roland;* Assistant Professors Armagost,* Aseneta, Gray,* Hinrichs,* Schenck- Hamlin,* Lewis Shelton, Lynn Shelton,* and Uthoff; Instructors Atkins, Barnes, Dean, Firling, Hadley, MacFarland, Molineux, Nichols, Ross.

Undergraduate Study

The Department of Speech offers study in the areas of general speech, linguistics, theatre, and speech pathology-audiology.

The undergraduate major requires at least 21 hours in one of the four areas and nine hours in other areas within the department. See speech secondary education requirements, College of Education, for teacher certification.

Students intending to attempt to quiz out of Oral Communication IA for credit should enroll in the line number in the current line schedule which is designated for speech "quiz out." To receive credit by quiz out, a student must receive an A, B, or C.

Graduate Study

In the Department of Speech major work is offered leading to the degree Master of Arts in the following fields: general speech, linguistics, speech pathology-audiology, and theatre. See interdepartmental program in linguistics, page 100.

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 science 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 six to eight semester hours. Plan B: A minimum of 30 semester hours of graduate credit including a written report of two 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 the plans: A, B, or C.

Students in general speech and linguistics 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.

Courses in General Speech

Undergraduate Credit

281 080. Speech Seminar. (0). Special topics and lectures for speech majors. Required of all majors each semester. 281-080-0-1506

281 101. Spoken English for International Students. (3) I, II. Semi-intensive aural-oral familiarization in American English as a second language. Three hours academic credit, not applicable toward degree requirements. Student in curriculum requiring 120 credit hours must therefore accumulate 123 or 124 hours when taking this course. Hours will apply toward gradepoint average. 281-101-1-1506

281 105. Oral Communication I. (2). Selection and outlining of speech material, with emphasis on content, organization, and oral presentation. 281-105-0-1506

281 106. Oral Communication Ia. (3). Alternate to Spch. 105 permitting greater emphasis on preparation and delivery of speech material. Credit not granted for both Spch. 105 and 106. 281-106-0-1506

Three hours of credit for Oral Comm. Ia may be earned by "Quiz Out" with an A, B, or C. See description of "Quiz Out" in Speech under Undergraduate Study in Speech.

281 107. Oral Communication Ib. (3). 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 Examinations and English Readiness Examinations for International Students. 281-107-1-1506

281 108. Oral Communication IH. (2) Honors— Participation in and analysis of oral message situations, with emphasis on communication purposes, message design and presentations. 281-108-0-1506

281 109. Oral Communication IaH. (4). Honors Speech preparation and delivery; a survey of topics basic to rhetoric, communication and linguistics. For Arts and Sciences Honors students. 281-109-0-1506

281 125. Argumentation and Debate. (3) II. Basic theories of argumentation, with emphasis on their application in academic debate. Pr.: Spch. 105 or 106. 281-125-0-1506.

281 127. Small Group Discussion Methods. (3) II. Basic concepts of small group decision making. Projects emphasize participation in and analysis of communication in the small group. 281-127-0-1506

281 210. Debate and Drama Participation. (1 or 2). Four hours maximum credit. Pr.: Consent of director of the activity. 281-210-2-1506

281 235. 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. 281-235-0-1506

231 320. Introduction to General Semantics. (3). Basic studies in general semantics, communication models and related materials; emphasis upon problems of reference, definition and meaning in a communicative context. 281-320-0-1506

281 321. Public Speaking. (3). The principles of rhetoric applicable to speech composition and delivery. The preparation of speeches adapted to the professional requirements of students. As a term project each student investigates and speaks upon a significant public question of his own choosing. Pr.: Oral Communication I or Ia. 281-321-0-1506

281 327. Interviewing. (2-3). Examination of theories of interviewing with emphasis on developing the communication skills essential for an effective job interview. 281-327-1-1506

281 330. Introduction to Oral Rhetorical Study. (3) I. Survey of the basic theories of oral rhetoric from classical to modern time. Pr.: One course in oral communications. 281-330-0-1506

281 398. Sophomore Honors Seminar. (3) II. Open only to qualified students in the Arts and Sciences Honors Program. 281-398-0-4900

281 426. Coaching and Directing Speech Activities. (3). I. A review of 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. 281-426-1506-E

281 499. Senior Honors Thesis. (2) I, II, S. Open only to seniors in the Arts and Sciences Honors Program. 281-499-4-1506

Undergraduate And Graduate Credit In Minor Field

281 520. 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. 281-520-0-1506

281 525. Argumentation Theory. (3) I. Analysis of theories of argumentation as applied to advocacy inthe courtroom, labor arbitration, deliverative bodies and competitive debate. Special attention is given to propositions, burden of proof, issues, evidence, reasoning, analysis, case construction, organization and refutation. Pr.: 281-125. 281-525-0-1506

281 526. Persuasion. (3) II. The study of communication as persuasion; examination of contemporary approaches to persuasion. 281-526-0-1506.

281 527. Group Discussion Methods. (3) I, II. Examination of research, techniques and principles regarding the activities of face-to-face groups; emphasis upon achieving creative group endeavor through discussion. Pr.: 281-105 or 281-106 or 281-125 or 281-127. 281-527-0-1506.

Undergraduate And Graduate Credit

281 620. Perspectives on Communication. (3) I, II. Analysis of communication as persuasion, information transmission, symbolic interaction, and relational development. Theorists will include Aristotle, Burke, Shannon and Weaver, and their contemporaries. Pr.: Junior standing. 281-620-0-1506

281 621. Language and Social Interaction.(3) II. The spoken work and the message in the on-going process of communication. Topics will include analysis of symbolic expression; evaluation of speech style; and conversation. Pr.: 281-320 or 282-280; Junior standing. 281-621-0-1506

281 622. Nonverbal Communication. (3) I, II. Analysis of nonverbal communication in terms of time, space, form and action. A unit will also be given on the codification of nonverbal communication. Pr.: 281-520 and Junior standing. 281-622-0-1506

281 720. Seminar in General Semantics. (3). The writings of Alfred Korzybski and other germinal contributors to a modern theory of relationships among experience, linguistic habits and behavior. Pr.: Spch. 320. 281-720-0-1506

281 721. Communication Research Methods. (3) I, II, odd years. An introduction to methods and materials used in communication research including such techniques as content analysis, attitude scaling, stylistic analysis and physiological measurement. Pr.: 281-520 or graduate standing. 281-721-0-1506

281 725. 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. 281-725-0-1506

281 726. Seminar in Persuasion. (3) II odd years. Survey and analysis of advanced theory and experimental studies in persuasion. Pr.: Junior standing. 281-726-0-1506

281 730. Rhetorical Theory and Criticism. (3). Study of rhetorical theory and criticism from early Greek to modern times. 281-730-0-1506

281 731. Medieval and Renaissance Rhetoric. (3). A study of the influential works of rhetoric from St. Augustine to Thomas Wilson. Pr.: Spch. 730. 281-731-0-1506

281 732. Modern Rhetoric. (3). Readings in the rhetorical theories of Kenneth Burke and other twentieth century contributors. Pr.: Spch. 730. 281-732-0-1506

281 735. History of the Art of the Film. (3). History, critical theory, and techniques of the film as an art form from its inception to the present. Pr.: Spch. 235. 281-735-0-1506

281 736. Film Theory and Criticism. (3). Studies in film criticism based on the writings of Kracauer, Balasz, Eisenstein, Spottiswoode, and others. Pr.: Spch. 235. 281-736-0-1506

281 737. Documentary Film. (3). Production methods, theory, in documentary film production. 281-737-0-1506

281 799. Problems in Speech. (Var.). Open to students in any speech area. Pr.: Junior standing and consent of instructor. 281-799-3-1506

Graduate Credit

281 820. Seminar in Speech. (3). Selected topics in speech research. May be repeated for credit with change in topic. 281-820-3-1506

281 899. Research in Speech. (Var.). Pr.: Sufficient training to carry on the line of research undertaken and consent of instructor. 281-899-4-1506

LINGUISTICS

Undergraduate Credit

282 280. Introduction to the Study of Language. (3-4). Survey of the scientific study of language. Contributions of linguistics to an understanding of the nature of language. Presupposes no previous knowledge of linguistics. Three hours lec. and one optional additional hour rec. per week. 282-280-0-1505

282 510. Foundations of Semiotics. (3) II. The study of a general theory of signs; the detailed classification of sigsn and examination of several semiotic systems such as language, literature, culture, and society. The semiotic of communication and of signification. Pr.: Junior standing. 282-510-0-1505. (Same as Modern Language 510)

Undergraduate And Graduate Credit

282 681. General Phonetics. (3). Description of speech sounds and their classification according to place and manner of articulation. Exposure to the sounds of English and those of other languages. Students will acquire the ability to recognize, transcribe, and reproduce possible speech sounds. (Same as Engl. 681 and Mod. Lang. 681). 282-681-1-1505

282 682. Experimental Phonetics. (3). Introduction to experimental phonetics. Study of the physiologic, acoustic and perceptual characteristics of speech. Pr.: Spch. 350 and 351. 282-682-1-1505

282 780. Introduction to Linguistics. (3). The basic concepts of modern linguistics, with exposure to English and other languages. Provides the student with sufficient background to pursue more advanced courses. Assumes no previous linguistics study, but aimed at more mature students. (Same as Engl. 780 and Mod. Lang. 780.) 282-780-0-1505

282 781. Introduction to Historical Linguistics. (3). Methods of historical linguistics as used in the reconstruction of earlier forms and stages of a language. Pr.: Junior standing. (Same as Engl. 781 and Mod. Lang. 781). 282-781-0-1505

282 782. Language Typology. (3). Presentation and discussion of the languages of the world and the variant methods of their classification. (Same as Engl. 782 and Mod. Lang. 782). 282-782-0-1505

282 783. 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., Engl., or Mod. Lang. 681 and 780. (Same as Engl. 783 and Mod. Lang. 783.) 282-783-0-1505

282 784. Phonology II. (3). Cont. of 783. Pr.: Spch., Engl., or Mod. Lang. 783. (Same as Engl. 784 and Mod. Lang. 784.) 282-784-0-1505

282 785. 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 Mod. Lang. 780. (Same as Engl. 785 and Mod. Lang. 785.) 282-785-0-1505

282 786. Syntax II. (3). Cont. of 785. Pr.: Spch., Engl., or Mod. Lang. 785. (Same as Engl. 786 and Mod. Lang. 786.) 282-786-0-1505

282 787. Advanced Syntax. (3). Discussion of recent contributions in the area of English syntax or general linguistic theory. Pr.: Spch., Engl., or Mod. Lang. 785 and 786. (Same as Engl. 787 and Mod. Lang. 787.) 282-787-0-1505

282 788. Advanced Phonology. (3). Discussion of recent contributions in the area of English phonology or general linguistic theory. Pr.: Spch., Engl., or Mod. Lang. 783 and 784. (Same as Engl. 788 and Mod. Lang. 788.) 282-788-0-1505

282 789. Topics in Linguistics. (3). Seminar on a special topic in linguistics chosen from a broad spectrum of possible interest areas including history of linguistics, theories of performance, and linguistics and society. Topic to be announced for the semester in which offered. Course may be repeated for credit on another topic. Pr.: Spch., Engl., or Mod. Lang. 780. (Same as Engl. 789 and Mod. Lang. 789.) 282-789-0-1505

282 791. Methods and Techniques of Learning a Second Language. (3). Linguistics applied to the learning of a foreign language, especially English as a foreign language. Pr.: 12 hours of a foreign language (includes English for native speakers of languages other than English) and Spch., Engl., or Mod. Lang. 780. (Same as Engl. 791 and Mod. Lang. 791.) 282-791-0-1505

282 792. Field Methods in Linguistics. (3). Offered only on demand. An introduction to techniques of collecting and analyzing linguistic data in the field. Work with non-Western informants in class. Pr.: Consent of the instructor. (Same as Mod. Lang. 792 and Soc. and Anthro. 792.) 282-792-0-1505

Graduate Credit

282 890. Current Trends in Linguistics. (3). Seminar on some aspect of linguistic theory seen as an important new development or as an indication of possible future direction. Pr.: Consent of the instructor. 282-890-0-1505

Speech Pathology-Audiology

The speech pathology-audiology program exists to train professional personnel who are competent to help children and adults with communicative problems of speech, hearing and language. The program at Kansas State University has been designed to meet the March 1, 1975 requirements for certification of clinical competence of the American Speech and Hearing Association and the State of Kansas Department of Education requirements for speech clinician and school audiologist.

Evidence of meeting professional competency requires a minimum of 60 semester hours of academic credit. Eighteen of these 60 semester 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 semester hours must be in courses which provide: (1) information relative to communication disorders, and (2) 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 six semester hours may be in audiology for the cer-

tificate in speech pathology or in speech pathology for the certificate in audiology. No more than six 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 six semester hours required in the other area.

In addition, the graduate must have completed a minimum of 300 clock hours of supervised direct clinical experience with a variety of disorders and age groups in the campus speech and hearing center and the cooperating school and hospital training sites.

Courses in Speech Pathology-Audiology

Undergraduate Credit

283 115. Teach Your Child to Talk. (1). The information presented and discussed is designed to clarify how normal children learn to talk and to explain how parents can aid the development of their child's speech and language. 283-115-0-1120

283 140. Training of the Speaking Voice. (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. 283-140-1-1220

283 240. Elements of English Phonetics. (3). Analysis of sounds which make up English speech and consideration of how sounds vary phonetically and physiologically; acquire skill in the transcription of speech into the symbols of the International Phonetic Alphabet. 283-240-0-1220

283 243. Introduction to Speech Pathology. (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. 283-243-0-1220

283 250. 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. 283-250-0-1220

283 255. Language Development. (3) Basic review of the development of speech and language skills in children. 283-255-0-1220.

283 340. Hearing Problems and Hearing Tests. (3) I. Survey of the etiology and classification of hearing disorders. Introduction to hearing tests and measurements. 283-340-1-1220

283 345. Clinical Procedures in Speech Pathology and Audiology. (2). Orientation to clinical practicum. 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. 283-345-0-1220

283 350. Speech and Hearing Mechanisms I. (3). Anatomy and physiology of normal and abnormal speech mechanisms, including respiration, phonation, resonance and articulation. 283-350-0-1220

283 351. Speech and Hearing Mechanisms II. (3). Study of the ear and the mechanics of hearing. Pr.: Spch. 350. 283-351-0-1220

Undergraduate Credit And Graduate Credit In Minor Field

283 542. Developmental Psycholinguistics. (3). I. Research and theory of early development of vocalization, phonology, morphology, syntax, and semantics are reviewed. Variables which influence acquisition are discussed. 283-542-0-1220-E

Undergraduate Credit And Graduate Credit In Major Field

283 643. Language Assessment. (3). I. An introduction and overview of oral language assessment. An assessment paradigm that divides expressive and receptive tasks or procedures into the morphological, syntactic, and semantic levels of language will be presented. Pr.: Spch. 542. 283-643-1220-E

283 644. Communication Problems of the Hearing Impaired. (3). Problems in speech and language habilitation of individuals having hearing losses from mild to profound within appropriate educational and habilitative settings. Pr.: Spch. 640 and 745. 283-644-0-1220

283 645. Modification of Communication Disorders. (3). Behavior modification principles are utilized to develop techniques for attenuating, establishing, and maintaining vocal behavior of individuals who possess communication deficits. 283-645-1-1220

283 649. Diagnostic Methods in Speech Pathology. (3). Study of diagnostic and appraisal procedures utilized in the evaluation of speech and language disorders. 283-649-1-1220

283 650. Laboratory in Speech Pathology. (2-3). Supervised practice in the use of the materials and methods of speech pathology. Pr.: Spch. 645, 646, and 649. 283-650-3-1220

283 655. Language Intervention. (3). II. Methods of gaining behavior control, training imitation and treatment of morphological, syntactic, and semantic oral language disabilities in children. Pr.: Spch. 654 or consent of instructor. 283-655-1220-E

283 656. Speech and Hearing Handicapped School Child. (3). Study of the management of the speech and hearing impaired child in the school community. Speech improvement methods, utilization of resource personnel and interprofessional relationships are treated. Pr: Senior standing. 283-656-1-1220

283 657. Practicum in Public School Speech and Hearing Services. (5-8). 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 and senior standing. 283-657-2-1220

283 660. Laboratory in Audiology. (2-3). Supervised practice in the use of the equipment, materials and methods of audiology. Pr.: Spch. 351 and 640. 283-660-3-1220

283 740. Hearing Conservation. (3) II or on Demand. Effects of noise on hearing. Development, management and control of community hearing conservation programs. Pr.: 283-340. 283-740-1-1220

283 741. Fluency Disorders. (3) Research and theory concerning etiology characteristics, assessment and treatment of individuals with disfluency problems. Pr.: Spch. 645. 283-741-0-1220

283 742. Laryngeal Disorders. (3). Research and theory concerning etiologies, assessment, and clinical measurement of laryngeal pathologies. Pr.: Spch. 350. 283-742-1-1220

283 745. 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.: 283-351. 283-745-1-1220

283 746. Disorders of Articulation. (3). Research, theories, and principles concerning the diagnosis and management of articulation disorders. Pr.: Spch. 240. 283-746-1-1220

283 750. Cleft Palate and Cerebral Palsy. (3). Research and theory concerning etiology, characteristics, assessment and clinical management of individuals with cerebral palsy and cleft lip and/or palate. Pr.: Spch. 350, 645, and 646. 283-750-1-1220

283 755. Audiology II. (3) II. 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.: 283-745. 283-755-1220

283 768. Speech Reading and Auditory Training. (3). Principles and methods of maximizing receptive communication skills of the hearing impaired. Pr.: Spch. 640. 283-768-1-1220

GRADUATE CREDIT

283 840. Neuropathologies of Speech and Language. (3). Research and theory concerning nature, etiologies, evaluation, and principles of neuropathologies. Pr.: Spch. 645. 283-840-1-1220

283 843. Amplification in Hearing Rehabilitation.(3) II. Analysis of electroacoustic characteristics of hearing aids. Earmold acoustics. Selection and use of amplification. Pr.: 283-745 and consent of instructor. 283-843-1-1220

283 845. Theoretical Foundations of Audiology. (3). Study of the auditory mechanism, with emphasis on critical evaluation of current methods employed in clinical audiology. Pr.: Spch. 745. 283-845-1-1220

283 846. Seminar in Stuttering. (3). Current research concerned with stuttering behavior, etiology, developmental aspects, evaluation and remediation. Pr.: Spch. 645. 283-846-0-1220

283 847. Practicum in Audiology and Speech Pathology. (3-5). 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. 283-847-2-1220

283 849. Topics in Speech 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 nine hours with change in topic. 283-849-0-1220

283 855. Seminar in Language Assessment and Intervention. (3). I. Analysis of recent developments in psycholinguistic development assessment, and intervention. Pr.: Spch. 655 or consent of instructor. 283-855-1220-E

283 865. Seminar in Audiology. (3) I. Study of selected areas of audiology. May be repeated for a maximum of six credit hours with change in subject matter. Pr.: 283-755 and 283-843. 283-865-0-1220

Theatre and Interpretation

The undergraduate program 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 its discipline. The three purposes of the program are to provide (1) a liberal arts program in theatre (2) a pre-professional preparation and (3) the basic theatre skills for the bachelor candidate.

Six areas of training are offered: (1) technical theatre—scenery, (2) technical theatre—costume, (3)theatre history and literature, (4) acting-directing, (5) playwriting, and (6) theatre—dance.

A major consists of 30 hours in theatre and nine hours in other areas within the Department of Speech. All majors are required to take the following courses (theatre core):

284 266	Technical Production 1	3
284 267	Technical Production 2	3
284 370	Dramatic Structure	3
284 261	Fundamentals of Acting	3
284 572	History of Theatre 1	3
284 573	History of Theatre 2	3
284 565	Principles of Directing	3
		21

Students concentrating in technical theatre—scenery, technical theatre—costume, theatre history and literature, acting-directing, or playwriting are required to take their additional nine hours of theatre in courses numbered 500 or above. Because of the special demands of the theatre—dance concentration, students in that area are required to take the following courses in addition to the theatre core:

284 260	Stage Movement	3
284 268	Techniques of Makeup	3
284 560	Advanced Stage Movement	3
261 021	(121) Modern Dance 1	0-1
261 122	Modern Dance 2	1
261 065	(165) Ballet 1	0-1
261 166	Ballet 2	1
261 171	Jazz Dance	1
261 117	Social, Square and Folk Dance	1
261 323	Techniques of Intermediate Modern Dance	2*
261 325	Techniques of Intermediate Ballet	2*
261 500	Methods and Materials of Dance	3
261 501	Dance Composition	3
241 744	History of Dance	3
257 100	Music Fundamentals	3

*Each of these must be taken twice

Course offerings are available leading to the degree of Master of Arts. Prerequisite to admission into the graduate program in theatre are a superior academic record and background work essentially equivalent to our 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, C (as described on page 190). There are three fields of concentration within the theatre area: (1) history, literature, and criticism of theatre; (2) technical production, design, and lighting; (3) acting, directing, and playwriting. All graduate students are required to take nine hours of graduate credit in history, literature, and criticism courses. In addition, all graduate students must take a minimum of six hours of graduate credit in one of the other two fields and a minimum of three 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. (They may be used only to discharge elective requirements in the major.): General Speech 210, 735, 736; Theatre and Interpretation 160, 165, 560, 563, 664, 710, 712, 760, 763, 779.

Courses in Theatre and Interpretation

Undergraduate Credit

284 160. Introduction to Theatre. (3). Consideration of the basic elements of theatre: aesthetics, dramatic literature, theatre technology, and producing organizations. 284-160-0-1007

284 165. Appreciation of Theatre. (2). Direct experience with live theatre through an investigation of theatrical materials, forms; and styles and attendance at the University theatrical productions. 284-165-0-1007

284 260. 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 concurrently with stage movement. 284-260-1-1007

284 261. 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 six hours credit with consent of instructor. 284-261-1-1007

284 263. 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. 284-263-0-1007

284 266. Technical Production I. (3) I. Materials and techniques of scenery construction and theatre lighting. 284-266-0-1007

284 267. Technical Production II. (3). II. Materials and techniques of theatre costume construction and theatre drafting. 284-267-0-1007

284 268. Techniques of Makeup. (3). Techniques of makeup for stage, movies, and television. 284-268-1-1007

284 269. Fundamentals of Stage Lighting. (3). Basic theory of electricity, light and optics. Practical mechanics of stage lighting safety, instruments, and control systems. 284-269-0-1007

284 275. 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. 284-275-2-1007

284 370. 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. 284-370-0-1007

284 475. 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.) 284-475-0-1007

Undergraduate And Graduate Credit In Minor Field

284 560. Advanced Stage Movement. (3). Study in the physical development of character and advanced techniques of stage movement. May be repeated for a total of nine hours credit by qualified students. Pr.: Spch. 260 and one semester of ballet or modern dance. 284-560-1-1007

284 561. 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 nine hours credit by qualified students. Pr.: Consent of the instructor. 284-561-1-1007

284 562. Playwriting. (3). Theoretical study and practical application of techniques of playwriting with regard to plot, characters, and production; emphasis placed on the one-act form. May be repeated for a total of six hours credit. 284-562-0-1007

284 563. Storytelling. (2). A consideration of literary materials appropriate for children in nursery schools, kindergarten, and elementary schools. Major emphasis is directed toward training in the art of storytelling. Pr.: Spch. 105 or 106. 284-563-0-1007

284 565. Principles of Directing. (3). Study of the principles and techniques of directing for the theatre; investigation into the historical emergence of the director; study of current theories. 284-565-1-1007

284 570. The Lyric Theatre. (3) On demand. The history of operetta and musical comedy from Offenbach to the present (Same as Music 570). Pr.: Music 150 or Speech 165 or equiv. 284-570-0-1007

284 571. The Opera. (3). Survey of the history of opera with a review of the most important operas. (Same as Music 571.) Pr.: Music 150 or Spch. 165, or equiv. 284-571-0-1007

284 572. 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. 284-572-0-1007

284 573. 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 the instructor. 284-573-0-1007

Undergraduate And Graduate Credit

284 664. Creative Dramatics. (3). Study of techniques for the training and development of creative imagination in primary and secondary school children by means of group improvisation of plays. Emphasis placed on both skillful guidance of the children and the pursuit of original research. 284-664-0-1007

284 667. 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. 284-667-0-1007

284 710. Practicum in Theatre. (0-6). Supervised participation in all aspects of theatre, with emphasis on problems of a concentrated production program. May be repeated for a maximum of 12 hours credit. Pr.: Major in Theatre and Interpretation; three of the following: Spch. 261, Spch. 266, Spch. 562, Spch. 565, and consent of the instructor. (For transfer students equivalent background will be required.) 284-710-2-1007

284 711. 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.: Spch. 266 and consent of instructor. 284-711-0-1007

284 712. Theatre Management. (3). Theatre management, promotion, finance, organization; emphasis on contract negotiations and use of facilities. 284-712-0-1007

284 760. Children's Theatre. (3). Introductory course in theory and practice for Children's Theatre. Reading, demonstrations, practice study of play scripts; play selection and production methods; operation of and assistance in production of plays for the child audience. Pr.: Consent of the instructor. 284-760-0-1007

284 761. Advanced Acting. (3). Studies in style, techniques, and characterization. May be repeated for a total of nine hours credit by qualified students. Pr.: Consent of the instructor. 284-761-1-1007

284 762. 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 nine hours credit by qualified students. Pr.: Consent of instructor. 284-762-0-1007

284 763. 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 six hours credit by qualified students. Pr.: Consent of the instructor. 284-763-1-1007

284 764. 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. 284-764-0-1007

284 765. Practice in Directing. (3). A lecture-laboratory course with emphasis on directing dramatic productions under performance conditions. May be repeated for a total of nine hours credit by qualified students. Pr.: Consent of the instructor. 284-765-1-1007

284 766. Advanced Technical Production. (3). A lecture-laboratory course in advanced technical theatre problems of organization, planning, and execution of scenery, costumes, and lighting. May be repeated for a total of nine hours credit by qualified students. Pr.: Consent of the instructor. 284-766-1-1007

284 767. Theatre Costume Design. (3). II. Studies in theory and practice of costume design for the theatre. May be repeated for a total of six hours credit by qualified students. Pr.: 284-267 or consent of the instructor. 284-767-1-1007

284 768. Scene Design. (3). Principles and styles of design for the stage, utilizing sketches, diagrams, plates, and models. May be repeated for a total of six hours credit by qualified students. Pr.: Consent of the instructor. 284-768-0-1007

284 769. 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 six hours credit by qualified students. Pr.: 284-266 or consent of instructor. 284-769-1-1007

284 770. Greek Theatre. (3). Studies in the drama and stagecraft of the Greek period. 284-770-0-1007

284 771. Roman, Medieval, and Baroque Theatre. (3). Studies in the drama and stagecraft of the Roman, Medieval, and Baroque periods. 284-771-0-1007

284 772. Romantic Theatre. (3). Studies in the drama and stagecraft of the Romantic era. 284-772-0-1007

284 773. Modern European Theatre. (3). Studies in the European drama and stagecraft of the period from 1876 to the end of World War II. 284-773-0-1007

284 774. Avant-Garde Theatre. (3). Studies in Avant-Garde drama and stagecraft since World War II. 284-774-0-1007

284 776. Slavic Theatre. (3). Studies in the drama and stagecraft of the Slavic countries from 1800 to the present. Pr.: Junior standing. 284-776-0-1007

284 777. Aesthetics of the Theatre. (3). Principal emphasis on theoretical problems of dramatic art. 284-777-0-1007

284 778. 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.: Spch. 266. 284-778-0-1007

284 779. 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 the instructor. 284-779-2-1007

Graduate Credit

284 870. Seminar in Theatre. (3). Selected topics in theatre research. May be repeated for credit with change of topic. 284-870-0-1007

STATISTICS

Arthur Dayton, Head of Department*

Professors Feyerherm,* Fryer,* and Nassar;* Associate Professors Dayton,* Grosh,* Johnson,* Kemp,* Milliken,* and Perng;* Assistant Professors Hasza, Hess and Rubison.

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 high-speed calculating machines relieves the statistician of tedious computations and elevates his professional activity to that of an adviser, a consultant, a supervisor, a teacher, and/or a person engaged in basic research.

A person wishing to major in statistics may seek a Bachelor of Arts degree by satisfying the general requirements of that degree (page 101), completing Math. 240 and doing one of the following:

(a) Take one of Stat. 320, 330, 340, or 350; and either Stat. 341 or 351; and either Stat. 510 and 511 or Stat. 770 and 771; and one additional statistics course; or

(b) Take Stat. 702 or 703, 704 and 705, and also take either Stat. 510 and 511 or Stat 770 and 771 and one additional statistics course. Each statistics major also must take Comp. Sci. 200 and **one** of 201, 202, 203, 204 or 205. A student may seek a Bachelor of Science degree by satisfying the general requirements of that degree (page 101) and the same requirements as noted for the Bachelor of Arts degree. It also is recommended that such a student take extra courses in computer science, or otherwise gain extra experience in programming. Each student must consult an adviser in the Department of Statistics before enrolling.

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 can study toward the doctor's degree, enter industry or governmental service as statistical consultants, or join organizations which do scientific research in the biological, physical and social sciences or in the humanities. Holders of the master's degree also can 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

285 320. Elements of Statistics. (3) I, II, S. 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. 285-320-0-1702

285 330. Elementary Statistics for the Social Sciences. (3) I, II. 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. 285-330-0-1702

285 340. 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. 285-340-0-1702

285 341. 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. 285-341-0-1702

285 350. Business and Economic Statistics I. (3) I, II. 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. 285-350-0-1702

285 351. Business and Economic Statistics II. (3) I, II, S. Cont. 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. 285-351-0-1702

Undergraduate And Graduate Credit In Minor Field

285 510. 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 CI's and X^2; goodness of fit. Numerous applications. Pr.: Math. 222. 285-510-0-1702

285 511. Introductory Probability and Statistics II. (3) 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. 285-511-0-1702

285 550. 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 or 500. 285-550-0-1702.

Undergraduate And Graduate Credit

285 702. Statistical Methods for Social Sciences. (3) I. 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.: Stat. 330. 285-702-0-1702

285 703. 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 equivalent of college algebra. 285-703-0-1702

285 704. 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 per week during first half of semester. Pr.: Stat. 702 or 703. 285-704-0-1702

285 705. 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 per week during second half of semester. Pr.: Stat. 702 or 703. 285-705-0-1702

285 710. Sample Survey Methods. (2) II. Design, conduct, and interpretation of sample surveys. Pr.: Stat. 702 or 703. Meets four times per week during first half of semester. 285-710-0-1702

285 716. Non-Parametric Statistics. (2) II. 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 per week during second half of semester. Pr.: One previous course in statistics. 285-716-0-1702

285 720. 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. 285-720-0-1702

285 725. Digital Statistical Analysis. (3) II. Programming languages; efficient programming for analysis of variance and covariance, missing data, least squares, multiple regression, multiple correlation, and chi-square analyses. Emphasis on efficient programming. Pr.: Comp. Sci. 201 and Stat. 704 and 705 or concurrent enrollment. 285-725-0-1702

285 730. 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, and course in matrices. 285-730-0-1702

285 770. Theory of Statistics I. (3) I, S. 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. 285-770-0-1702

285 771. Theory of Statistics II. (3) II, S. Introduction to multivariate distributions; sampling distributions, derivation and use; estimation of parameters, testing hypothesis; multiple regression and correlation; simple experimental designs; introduction to non-parametric statistics; discrimination. Pr.: Stat. 770. 285-771-0-1702

285 799. Topics in Statistics. (Var.) I, II, S. Pr.: Stat. 703 or 770 and consent of instructor. 285-799-3-1702

Graduate Credit

285 810. 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. 285-810-0-1702

285 820. Experimental Design Theory. (3) II. Incomplete block designs; theory of the construction and analysis of experimental designs. Pr.: Stat. 720 and course in matrices. 285-820-0-1702

285 830. Statistical Population and Quantitative Genetics I. (3) I. Equilibrium law of gene frequencies; forces that change gene frequency; gene frequency distributions; prediction equations for selection. Pr.: Stat. 704 and 705 and six semester hours of genetics. 285-830-0-1702

285 831. Statistical Population and Quantitative Genetics II. (3) II. Estimation of genetics parameters; inbreeding, heterosis, level of dominance; epistasis, genetic load linkage; experimental approaches to statistical genetics. Pr.: Stat. 830. 285-831-0-1702

285 840. Theory of Statistics III. (3) I. Functional forms and properties of selected distribution functions. Characteristic functions. Limiting distributions. Pr.: Stat. 771. 285-840-0-1702

285 841. Theory of Statistics IV. (3) II. Convolutions of distributions. Theory of runs. Distributions of order statistics. Sequential analysis. Pr.: Stat. 840. 285-841-0-1702

285 850. Stochastic Processes I. (3) II. Generating functions; conditionaly probability and conditional expectations; normal processes and covariance stationary processes; poisson processes; renewal processes; Markov chains, discrete time. Pr.: 285-770. 285-850-0-1702.

285 851. 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.: 285-850. 285-851-0-1702.

285 860. Linear Models I. (3) I. Multivariate normal covariance matrix and operations with it; distribution of quadratic forms; some specific linear models; application to experimental design, analysis of variance and variance components. Pr.: Stat. 704, 705, 771; course in matrices. 285-860-0-1702

285 861. Linear Models II. (3) II. Generalized inverses; polynomial regression; experimental design, variance-component, and mixed models. Pr.: Stat. 860. 285-861-0-1702

285 870. Non-Orthogonal Data Analysis. (3) I. Computation and interpretation for one, two and n-way analysis of variance and anlaysis of covariance problems with equal and unequal variances; fixed, random and mixed model; all the above for unequal sample sizes. Pr.: 285-861. 285-870-0-1702.

285 898. Master's Report. (2) I, II, S. Pr.: Consent of instructor. 285-898-4-1702

285 899. Master's Thesis Research. (Var.) I, II, S. Pr.: Consent of instructor. 285-899-4-1702

285 945. 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. 285-945-2-1702

285 950. Advanced Studies in Probability and Statistics. (3) 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 and consent of instructor. 285-950-0-1702

285 965. Multivariate Analysis I. (3) I. Matrix formulas, Jacobian of matrix transformations, likelihood estimates; Hotelling's T^2; generalized F, generalized beta, generalized Cochran's Theorem; distributions of simple, partial, and multiple correlation coefficients; testing multivariate hypothesis; exact and asymptotic distributions of test statistics. Pr.: Stat. 861 and one year of advanced calculus. 285-965-0-1702

285 966. Multivariate Analysis II. (3) II. Classification and discrimination; canonical correlations; distributions of roots of determinantal equations; multivariate analysis of variance; union-intersection principles; simultaneous confidence estimation; multiple comparisons; nonparametric multivariate inference. Pr.: Stat. 965. 285-966-0-1702

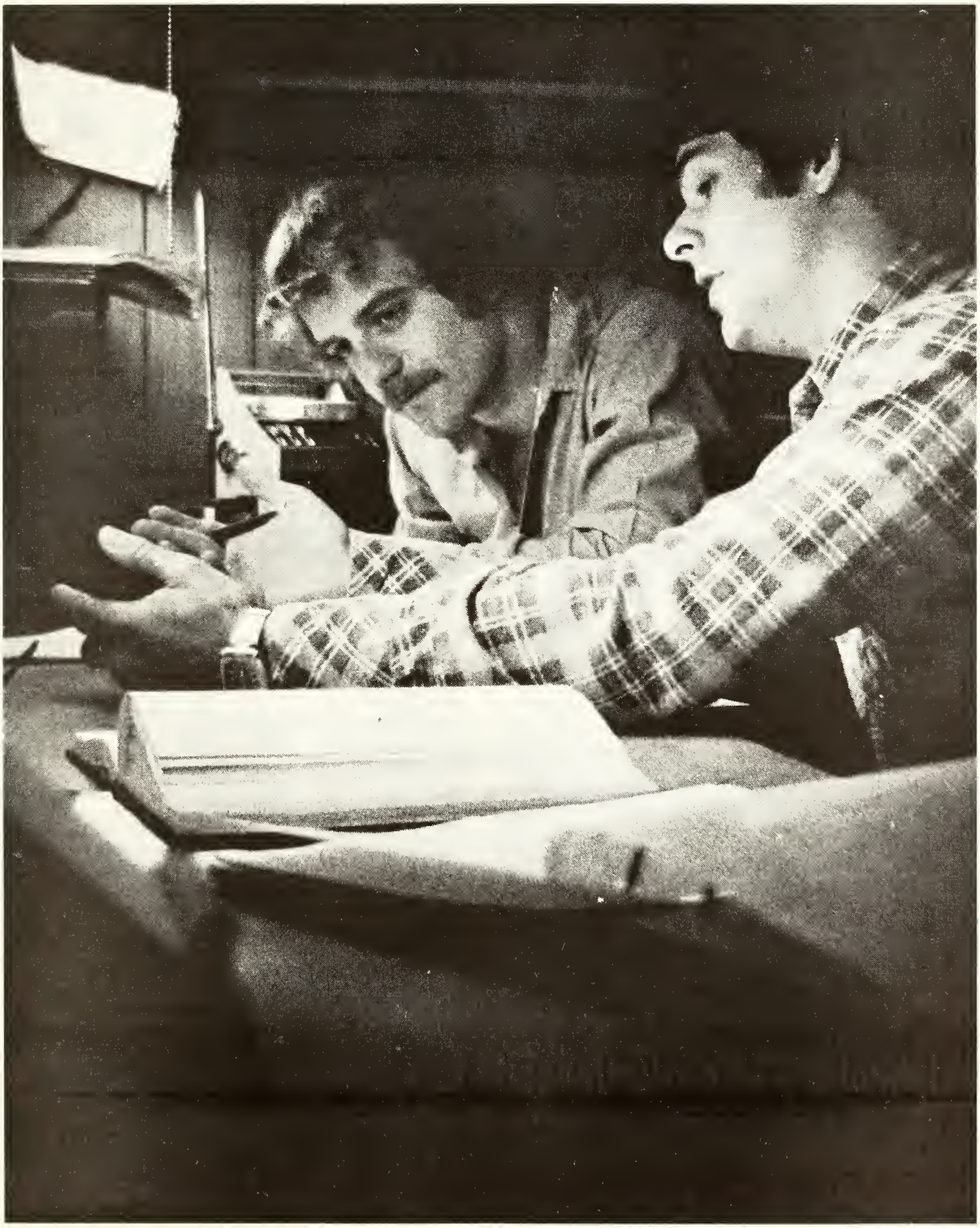
285 990. Foundations of Probability I. (3) I, in alt. years. Distribution functions; characteristic functions; sums of independent random variables; Central Limit Theorem. Pr.: Equivalent of two semesters of advanced calculus. Stat. 840. 285-990-0-1702

285 991. Foundations of Probability II. (3) II. Conditional random variables, martingales, ergodic theorems. Pr.: Stat. 990. 285-991-0-1702

285 995. Advanced Inference I. (3) I. Statistical decision problem, risk functions, and optimal procedures; classical and Bayesian sufficient statistics; estimation: least squares, moments, maximum likelihood, best unbiased, least invariant estimations; asymptotic optimal maximum likelihood procedures. Pr.: Equivalent of two semesters of advanced calculus. Stat. 841. 285-995-0-1702

285 996. Advanced Inference II. (3) II. Testing hypotheses: Neyman-Pearson Lemma; monotone likelihood ratio and exponential families; method of least favorable distribution; uniformly best unbiased and best invariant procedures; confidence sets and uniformly best test procedures. Pr.: Stat. 995. 285-996-0-1702

285 999. Research in Statistics. (Var.) I, II, S. Pr.: Consent of instructor. 285-999-4-1702



College of Business Administration

Robert A. Lynn, Dean*
John R. Graham, Associate Dean*
Kay C. Stewart, Assistant to the Dean

Professors Barton-Dobenin,* Coleman,* Fox,* Jones,* Laughlin,* Lynn,* O'Brien,* and Richards; Associate Professors Brown,* Graham,* Gugler,* Stark,* Thiessen, Vaden,* and Winkler; Assistant Professors Buzenberg, Caldwell, Doering, Ferguson, Gentry,* Hollinger, Maxfield, McCain, McCarty, Norvell,* Oh, Pohlman,* Riley and Townsend; Instructors Bonczkowski, Castro, Clement, Donnelly, Ginn, Grotheer, Innes, Killough, Stewart, Stockard, and Streit; Emeritus: Professor Clark; Associate Professors Eriksen and Mulanax; Assistant Professors Gudgell and Rapp.

The main objective of the College of Business Administration is to provide a challenging opportunity for liberal education and professional study and development in business administration and accounting. Undergraduate and graduate programs alike are designed to encourage maximum development of the student into an informed, capable and responsible individual.

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 matter and instructional techniques focus on decision-making and implementation of decisions through critical and creative analysis.

In addition to its instructional programs, the College of Business Administration recognizes its responsibilities and opportunities to work closely with the business community. It provides to business, through the Committee on Management Services and the general faculty, professional services in accounting, finance, marketing and management. The College of Business Administration also sponsors numerous short courses and conferences for business and management groups.

The College of Business Administration participates in the Intercollegiate Program in Women's Studies, see page 43.

Undergraduate Study

At the undergraduate level, the College of Business Administration seeks to produce a graduate with: (1) a broad education in the arts, sciences and humanities, (2) a solid knowledge and understanding of the functioning of the business world, (3) sufficient knowledge and skill in a field of specialization to obtain a position in business, and (4) the proven ability to think creatively and analytically in order to progress into positions of greater responsibility in the future. (To accomplish this purpose, the college is future-oriented. To be of any lasting value, education for business must develop students' abilities to project their thinking and to shape the future.)

During the first three years, students take work in written and oral communication; mathematics; statistics and quantitative analysis; social, behavioral and natural sciences; and the humanities. The required "core courses" in accounting, economics, business law, finance, management and marketing provide the fundamentals of business administration. Seven majors are available for selection by business administration students.

The college has two internship programs which provide valuable practical experience. The accounting internship is designed for accounting majors either the first or second semester of their senior year and operates in cooperation with certified public accounting firms. The business administration internship is for students between their junior and senior years. This is a summer program offered in cooperation with numerous business firms throughout the midwest.

Accreditation

The undergraduate program at Kansas State University is accredited by the American Assembly of Collegiate Schools of Business (AACSB).

Bachelor of Science in Business Administration

Curriculum Requirements. The curriculum in business administration is designed from a general management viewpoint. Prior to or during the first semester of the junior year, students select their major field of study. These fields are: accounting, finance, general business, industrial relations, management, marketing and office administration.

The following curriculum is effective for all students entering the College after August 1, 1973 or graduating after August 1, 1977.

Communications			
229	100	English Composition I	3
229	120	English Composition II	3
281	106	Oral Communications Ia	3
		Communication Electives	3
			12
Social Science			
269	325	U.S. Politics	3
273	110	General Psychology	3
277	220	Introduction to Sociology	3
			9
Quantitative			
245	100	College Algebra[1]	3
245	500	Introduction to Analytic Processes[1]	3
285	350	Business and Economic Statistics I	3
285	351	Business and Economic Statistics II	3
286	200	Fundamentals of Computer Programming	2
286	201-205	Language Lab	1
			15

General Electives

Social Science		3
Humanities		6
Natural Science[2]		6
Social Science, Humanities or Natural Sciences		6
		21

Business and Economics

225 110	Economics I	3
225 120	Economics II	3
305 260	Fundamentals of Accounting	3
305 370	Mgr. Cost Controls	3
305 390	Business Law I	3
305 420	Management Concepts	3
305 421	Production Management	3
305 440	Marketing	3
305 450	Business Finance	3
305 695	Business Policy	3
305 696	Business and Society	3
	Economics Electives	6
	Major field (see below)	18
		57

Other

Concepts in Physical Education	1
Free Electives	11
Total credit hours required for graduation	126

MAJOR FIELDS

Accounting

	Required:	
305 360	Intermediate Accounting I	3
305 371	Cost Accounting	3
305 331	Intermediate Accounting II	3
305 460	Advanced Accounting	3
	Plus six credit hours selected from:	
305 461	Taxation[3]	3
305 465	Accounting Internship	3
305 660	CPA Problems	3
305 661	CPA Theory and Law	3
305 662	Auditing I[3]	3
305 663	Auditing II	3
305 665	Comp. App. in Acctg	3
305 666	Public and Governmental Accounting	3
305 676	Advanced Managerial Controls	3

Finance

	Required:	
305 550	Financial Institutions	3
305 551	Investments	3
305 650	Capital Budgeting	3
305 651	Financial Management	3
	Plus six hours selected from:	
305 360	Intermediate Accounting I	3
305 350	Insurance	3
305 361	Intermediate Accounting II	3
305 552	Real Estate	3
305 553	Business Risk Management	3
305 653	Portfolio Management	3
305 692	Applications of the Computer in Business	3
305 770	Controllership	3
225 510	Intermediate Macro	3
225 520	Intermediate Micro	3
225 530	Money and Banking	3
225 633	Public Finance	3
225 681	International Trade	3

General Business

18 credit hours required to be taken from courses offered by the College of Business Administration and distributed as follows:

12 of the 18 hours must be selected from among the required courses in the finance, labor relations, management or marketing majors representing at least three of those four major areas.

The remaining six hours must be selected from the business courses listed in either the required or the elective courses listed for those four majors.

Labor Relations

	Required:	
305 530	Labor Legislation	3
305 531	Personnel and Wage Administration	3
305 630	Industrial Relations	3
305 631	Labor Arbitration	3
	Plus six hours selected from:	
305 520	Organizational Behavior	3
305 632	Contemporary Issues in Labor Relations	3
305 692	Applications of the Computer in Business	3
225 620	Labor Economics	3
225 627	Contemporary Labor Problems	3
550 551	Work Design	3
550 609	Occupational Safety and Health	3
305 641	Business Logistics	3

Marketing

	Required:	
305 540	Consumer Behavior	3
305 640	Marketing Research	3
305 642	Marketing Strategy	3
305 643	Promotional Administration	3
	Plus six hours selected from:	
305 541	Retailing	3
305 542	Sales Management	3
305 543	Sales Communications	3
305 641	Business Logistics	3
305 644	International Marketing	3
305 692	Applications of the Computer in Business	3

Management

	Required:	
305 520	Organizational Behavior	3
305 521	Quantitative Management	3
305 531	Personnel and Wage Administration	3
305 622	Decision Analysis	3
	Plus six hours selected from:	
305 371	Cost Accounting	3
305 630	Industrial Relations	3
305 632	Contemporary Issues in Labor Relations	3
305 691	Business Measurements and Forecasting	3
305 692	Applications of the Computer in Business	3
550 554	Industrial Facilities Layout & Design	3
550 609	Occupational Health and Safety	3
305 641	Business Logistics	3
305 690	International Business	3

Office Administration

	Required:	
305 111	Production Typing	3
305 213	Transcription	3
305 310	Exec. Secretarial Procedures	3
305 311	Office Management	3
	Plus six hours selected from:	
305 210	Office Machines	3
305 350	Insurance	3
305 391	Administrative Communications	3
305 392	Business Law II	3
305 531	Personnel and Wage Administration	3
305 552	Real Estate	3
305 590	Women in Business	3

Dual Degree in Business Administration

The dual degree programs allow students to earn the Bachelor of Science in Business Administration degree in addition to their nonbusiness degree. Because of course sequence requirements, the program should be commenced during a student's junior year. Students must enrolled in both the college offering their nonbusiness degree and the College of Business Administration.

The following requirements are effective for all students entering the program after August 1, 1973, or all students graduating after August 1, 1977. Any student who wishes to take a dual degree must take a minimum of 150 credit hours and satisfy the requirements for both degrees. The following requirements must be completed either as part of the student's nonbusiness degree or in addition to it.

Dual Degree Requirements

Many of the dual degree requirements have prerequisites. See department listings for specific information.

305 260	Fundamentals of Accounting	4
305 370	Mgr. and Cost Controls	3
305 390	Business Law I	3
305 420	Management Concepts	3

305	421	Production Management	3
305	440	Marketing	3
305	450	Business Finance	3
305	695	Business Policy	3
305	696	Business and Society	3
225	110	Economics I	3
225	120	Economics II	3
245	500	Introduction to Analytic Processes[1]	3
286	200	Fundamentals of Computer Programming	2
286	201-205	Language Lab	1
Business Electives			9
			49

Business Electives must be selected from among the required courses in the finance, labor relations, management, marketing, accounting or office administration majors.

1. Calculus I will waive the College Algebra requirement and substitute for the Introduction to Analytic Processes requirement.
2. Students must take at least one scientific laboratory.
3. Students wishing to qualify to sit for the CPA examination in Kansas must take Taxation and Auditing I. Students preparing to sit for the Certified Management Accounting (CMA) exam are advised to take Intermediate Microeconomics and Organizational Behavior as well as Taxation and Auditing I.

Associate of Arts Degree at Ft. Riley (A.A.)

In cooperation with the Division of Continuing Education, the College of Business Administration offers an A.A. degree at Ft. 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 Fort Riley Degree Program, Division of Continuing Education, Kansas State University.

Pre-Business Education

Effective Fall Semester, 1975, 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: (1) the acquisition of skills in comprehension and expression, (2) understanding human institutions, and (3) the ability to think clearly, carefully and independently. The stated purpose of the undergraduate program in business administration is to achieve these objectives. 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.

Information For Pre-Business Students Transferring To Kansas State University

Many of the fundamental courses required for a degree in business administration may be obtained through pre-business programs at other four-year institutions or community colleges. In general, two years of course work will be transferable. Below are some suggested courses to be taken the first two years to transfer to Kansas State University for a degree in business administration without loss of credit.

First Semester	Credit Hours
English Composition I	3
Oral Communications (speech)	3
College Algebra*	3
Accounting I	3
General Psychology	3
Concepts in Physical Education (1st or 2nd semester)	1
	16

Second Semester	Credit Hours
English Composition II	3
American Government	3
Accounting II	3
Humanities Electives	3
Social Science Electives	3
Concepts in Physical Education (1st or 2nd semester)	1
	16

Third Semester	Credit Hours
Economics I	3
Fund. of Computer Programming	3
Natural Science Electives	3 or 4
Humanities Electives	3
Social Science Electives	3
	15 or 16

Fourth Semester	Credit Hours
Economics II	3
Business Law	3
Introduction to Sociology	3
Natural Science Electives	3 or 4
Managerial Accounting, or Business Communication	3
	15 or 16

*The prerequisite of College Algebra for business administration students is two units of high school algebra. If a student has had one unit of high school algebra only, Intermediate Algebra must be taken as a first semester freshman and College Algebra as a second semester freshman. Intermediate Algebra credit cannot be applied to a degree. If a student takes Analytic Geometry and Calculus I, it will substitute for 245 500 Introduction to Analytic Processes and his College Algebra requirement will be waived.

Graduate Study

The College of Business Administration provides graduate work leading to a Master of Business Administration (MBA) degree and a Master of Accountancy degree. All graduate programs require study in behavioral management, quantitative techniques and the decision-making processes. Specialization in a particular field is provided through the use of electives.

Admission to graduate study at Kansas State University is granted on three conditions: (1) full standing, (2) provisional, or (3) probational. Recommendations concerning an applicant's qualifications and admission are made to the dean of the Graduate School by a faculty committee of the College of Business Administration. The final decision regarding admission of an applicant is made by the dean of the Graduate School.

Admission in full standing to graduate study in business and accounting normally requires a minimum grade point average of 3.0 (B average) in an institution whose requirements for the bachelor's degree are substantially equivalent to those of Kansas State University.

Applicants with grade averages below 3.0 but above 2.5 will be considered for probational admission. In such cases evidence of superior capability in business, economics and mathematics or statistics will be considered.

Provisional admission may be granted to applicants who have subject matter deficiencies in un-

dergraduate preparation. Normally these deficiencies will be made up by enrolling in courses for undergraduate credit.

All applicants must take the Graduate Management Admissions Test (GMAT). This test is a required part of the application, and the applicant should have the testing service report the test scores to the director of the graduate program, College of Business Administration. A score of 450 or higher is an admission requirement which is waived only in exceptional cases where other strengths are demonstrated. Requests for applications and all questions concerning the test, including time and place, should be addressed to: Educational Testing Service, Box 966, Princeton, New Jersey 08540.

Completed applications should be on file with the College of Business Administration at least 60 days prior to requested enrollment date. For international students the completed application should be on file 120 days prior to requested enrollment date.

Master of Business Administration (MBA)

The program leading to the MBA degree in Business Administration is designed to provide broad education in business management. Depth in a particular area is possible through the use of electives.

Admission Requirements: In addition to the general admission requirements set forth above, the applicant must have completed at least two courses in economics and one course in accounting, business finance, business law, management, marketing, production management, business policy, statistics, calculus, and computer programming.

The Program of Study: Generally, each candidate must complete the following core courses, or their reasonable equivalent, and fulfill either option A or option B. Other programs must be arranged with the advice of the graduate committee.

	Required Core:	
305 820	Behavioral Management Theory	3
305 840	Advanced Marketing Management	3
305 850	Financial Controls for Business	3
305 870	Accounting Controls for Business	3
305 891	Legal and Social Environment of Business	3
		15
	Select two:	
305 890	Decision Theory of the Firm	(3)
305 892	Research Methods in Business	(3)
305 893	Business Operations Analysis	(3)
		6
Option A:		
Required core		21
Elective area*		9
Written comprehensive exams required		0
	Hours required for graduation	30
Option B:		
Required core		21
Electives*		3
Master's thesis		6
Oral defense of thesis required		0
	Hours required for graduation	30

*Elective areas include, but are not necessarily limited to, the following: computer science; economics; finance; industrial relations; management; marketing; operations research (industrial engineering); political science; psychology; sociology; statistics. At least 24 hours must be taken at the 800 level or higher.

Master of Accountancy (M.Acc.)

The program is designed to prepare graduate students for professional careers in public, industrial, or governmental accounting. The M.Acc. program supplements the bachelor's degree with a major in accounting by adding a fifth year of professional education.

Admission Requirements: In addition to the general admission requirements set forth above, the student must have completed work in the following areas:

Area	Credit Hrs.
Accounting (minimum)	13*
Economics	9
Business Finance	3
Business Law	3
Management	3
Marketing	3
Statistics	3
Computer Programming	3
Math through Calculus	3-4
Business Policy	3
Production Management	3

*Additional accounting hours are recommended.

The Program of Study: Generally, each candidate must complete one of the following programs. Any exceptions must be arranged with the advice and consent of the graduate committee. Candidates who wish to qualify for a C.P.A. certificate (after passing the Uniform C.P.A. exam) upon completion of their degree requirements must consult with the director of graduate programs concerning the regulations of the State of Kansas. Individual copies of these regulations may be obtained from the Board of Accountancy, First National Bank Tower, Topeka, Kansas 66603. In 1978 the regulations require students to elect courses 861 and 862. Students can also structure a program to qualify for a Certified Management Accounting (C.M.A.) certificate.

	Required:	
305 820	Behavioral Management Theory	3
305 850	Financial Controls for Business	3
305 860	Accounting Theory I	3
305 891	Legal and Social Environment	3
		12
	Select two:	
305 890	Decision Theory of the Firm	(3)
305 892	Research Methods in Business	(3)
305 893	Business Operations Analysis	(3)
		6
	Select four:	
305 663	Auditing II	(3)
305 665	Computer Applications in Accounting	(3)
305 676	Advanced Managerial Controls	(3)
305 861	Accounting Theory II	(3)
305 862	Tax Planning and Research	(3)
		12
Written comprehensive exams required		0
Total		30

Courses in Business and Accounting

Undergraduate Credit

305 110. Intermediate Typing. (3) I, II. Emphasis on speed and accuracy in typing straight copy and in production of letters, manuscripts, and tabulated reports. Pr.: One unit of high school typing. 305-110-0-0514

305 111. Production Typing. (3) I, II. Develop increased speed and accuracy in production typing—legal forms, statistical materials and letters—within acceptable time limits. Pr.: 305 110 or equiv. 305-111-0-0514

305 112. Shorthand I. (4) I, II. Beginning course in fundamentals of Gregg Shorthand. Open only to students with no previous shorthand instruction. Pr.: One unit of high school typing. 305-112-0-0514

305 202. Small Business Operations. (3). Offered on sufficient demand. Opportunities in business ownership, principles governing the starting of a small enterprise; importance, status, problems, and management of a small business. Pr.: 225 110. Not open to students in College of Business Administration. 305-202-0-0506

305 210. Office Machines. (3) II. Instruction in electronic and 10-key calculators, techniques in machine dictation and transcription, and layout planning and production on duplicating machines. 305-210-1-0501

305 212. Intermediate Shorthand. (3) I, II. Emphasis on writing speed and the introduction of transcription. Pr.: 305 110 or concurrent enrollment and 305 112 or one unit of high school shorthand. 305-212-0-0514

305 213. Transcription. (3) I. Advanced shorthand with speeds of 100 to 120 or higher. Setting up business letters in various styles—gaining speed in transcription of letters and manuscripts. Pr.: 305 110 and 212 or equiv. 305-213-0-0514

305 260. Fundamentals of Accounting. (3) I, II, S. The preparation and use of accounting records for individual, partnership and corporate business organizations. Pr.: Sophomore standing. 305-260-0-0502

305 293. Black Business Studies. (2-3) On sufficient demand. Exposure to operations of black-managed enterprises is the focal point. The study of these businesses and their problems is approached in an interdisciplinary fashion. 305-293-0-0501

305 294. World Business—A Field Study. (2) Spring Intersession. A concentrated study tour of businesses in selected world industrial centers outside the continental United States. 305-294-2-0504

305 301. Personal Finance. (2). Finance from the viewpoint of the individual; principles and practices of credit buying, borrowing, saving and investing; purchase of government bonds, insurance, real estate and annuities; problems of taxation and wills. Not open to students in College of Business Administation. Pr.: Sophomore standing. 305-101-0-0501

305 310. Executive Secretarial Procedures. (3) II. Study of operational and managerial functions top-level secretaries perform. Situations are provided giving practical, meaningful experiences that develop administrative and supervisory skills and functions. Pr.: 305 110 or equiv. 305-310-0-0514

305 311. Office Management. (3) I, II. An examination of the theory and practice of office management. The scope of the course is defined by the five functions of the office manager—organizing, staffing, directing, planning, and controlling. 305-311-0-0506

305 350. 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 contributions of the insurance industry. Pr.: 225 110. 305-350-0-0512

305 360. Intermediate Accounting I. (3) I, II. Application of accounting theory to the valuation of balance sheet accounts with emphasis on cash inventories and fixed assets. Pr.: 305 370 and Junior standing. 305-360-0-0502

305 361. Intermediate Accounting II. (3) I, II, S. Statement analysis and special problems peculiar to the corporate form of organization. Pr.: 305 360. 305-361-0-0502

305 370. Managerial and Cost Controls. (3) I, II, S. Development and use of accounting information for management control. Covers statement analysis, cash and funds flows, cost analysis and budgeting. Pr.: 305 260 and 245 100. 305-370-0-0501

305 371. Cost Accounting. (3) I, II. Allocation of production costs to determine unit costs of goods manufactured and sold and the utilization of such data by management. Pr.: 305 370. 305-371-0-0502

305 390. Business Law I. (3) I, II, S. A study of law as it relates to business. Coverage includes contracts, agency and partnerships. Pr.: Junior standing. 305-390-0-0501

305 391. Administrative Communications. (3) I, II. Preparation of business communications, reports and correspondence, and analysis of communication systems within an enterprise structure. Pr.: 229 120 and 281 106. 305-391-0-0501

305 392. Business Law II. (3) I, II. Study of the social forces which bring about changes in civil law as it affects commercial transactions. Coverage includes corporations, commercial paper and contractual rights. Pr.: 305 390. 305-392-0-0501

305 399. Honors Seminar in Business. (1) I, II. Readings and discussions on selected topics. A maximum of four hours credit may be obtained. 305-399-0-0501

305 420. Management Concepts. (3) I, II, S. Fundamental processes in managing the going concern. Provides a basic understanding of administrative problems through study of organization theory, quantitative, and behavioral aspects of decision making. Pr.: 273 110, 277 211 and junior standing. 305-420-0-0506

305 421. 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.: 225 120, 245 500 and 285 351. 305-421-0-0506

305 440. Marketing. (3) I, II, S. A general study of marketing from a social-economic point of view; a study of the institutional organization of the market and the functioning of marketing agencies in the distribution of goods. Pr.: 225 110 and junior standing. 305-440-0-0509

305 450. 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.: 225 120, 285 350 286 200 and lab and 305 370. 305-450-0-0504

305 460. Advanced Accounting. (3) I, II. Accounting for partnerships, installment sales, consignments, consolidated statements, and other special topics. Pr.: 305 361. 305-460-0-0502

305 461. 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.: 305 370 and junior standing. 305-461-0-0501

305 465. Accounting Internship. (3) II. Provides eight weeks of practical diversified public accounting experience for accounting majors. The course objective is a broader educational experience for participating students. Pr.: 305 361, 461, 662, and consent of instructor. 305-465-2-0502

305 495. Business Administration Internship. (3) S. Eight weeks of business experience between junior and senior years coordinates the interests of participating students and firms. Pr.: 305 420, 440, 450, completion of junior year and consent of instructor. 305-495-2-0501

Undergraduate and Graduate Credit

305 520. Organizational Behavior. (3) I. Examination of psychological and sociological variables important in understanding individual motivation, group functioning, change, creativity and leadership in organizations. Pr.: 305 420 or 531. 305-520-0-0501

305 521. Quantitative Management. (3) I. Emphasis on quantitative techniques, models and the integrative nature of management systems. Includes PERT, CPM, linear programming and decision risk analysis. Pr.: 245 500 or 220, 285 350 and 286 200 and lab, and 305 420. 305-521-0-0506

305 530. Labor Legislation. (3) II. Development of government regulations pertaining to legal rights and duties of employers, unions, and the public. Analysis of labor laws and their effect on labor-management relationships. Pr.: Junior standing. 305-530-0-0513

305 531. Personnel and Wage Administration. (3) I, II. Personnel program and its operational processes of manpower planning, recruiting, testing, development, and wage administration. Analysis of role of personnel department in the organization with emphasis on problem solving. Pr.: Junior standing. 305-531-0-0515

305 540. Consumer Behavior. (3) I, II, S. Behavioral concepts and theories as they relate to marketing: motivation, learning, belief, attitude, habit, taste, custom, fashion, social class, reference, group influence, value and utility theory. Pr.: 305 440. 305-540-0-0509

305 541. Retailing. (3) II. 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.: 305 440. 305-541-0-0509

305 542. Sales Management. (3) I. From the point of view of the manufacturer or wholesaler, a study of management problems relating to sales—including sales programs, product and distribution policies, price policy, management of sales force, sales promotion and market research. Pr.: 305 440. 305-542-0-0509

305 543. Sales Communication. (3) I. Intensive investigation of the art of persuasive sales communication, with emphasis on selection, organization and effective oral presentation of marketing, sales and promotional information. Pr.: Junior standing. 305-543-0-0509

305 550. Financial Institutions. (3) I. The role of financial intermediaries in the flow of funds; emphasis on the financial management concepts that underlie these institutions and their impact on business and economic growth. Pr.: 305 450. 305-550-0-0504

305 551. Investments. (3) I. 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.: 245 500 or 220, 285 350, 286 200, any language lab, and 305 450. 305-551-0-0505

305 552. Real Estate. (3) II. Principles and practices including legal, economic and social implications from the viewpoint of the real estate practitioner, investor and society. Pr.: Junior standing. 305-552-0-0511

305 553. Business Risk Management. (3) I. Development of risk management and insurance programs for the business firm. Risk identification, evaluation and treatment for business property and life insurance, group insurance and pension fund programs. Pr.: 305 450. 305-553-0-0501

305 583. Veterinary Practice Management. (3) II. The business aspects of a veterinary practice, including consideration of factors involved in establishing and maintaining a professional practice, professional ethics, accounting, and investments. Pr.: Fourth year standing in the College of Veterinary Medicine. No other students admitted. Joint listing with College of Veterinary Medicine.

305 590. Women in Business. (3) I. A study of the legal and economic impact of women in the work force. The social and sexual dimensions of occupations and personnel procedures relating to women in modern industrial society. Pr.: Junior standing. 305-590-0-0501

305 622. Decision Analysis. (3) II. Systematic application of decision theory, input-output analysis and quantitative techniques to business problems and policy. Includes cases that integrate concepts and techniques, develop analytic skills and creative investigation. Pr.: 305 521. 305-622-0-0501

305 630. Industrial Relations. (3) I. Study of strategies and procedures in industrial relations including prenegotiations and negotiations, grievance procedure, arbitration, labor law, conflict resolutions, behavioral aspects of union-management relations and current issues. Pr.: Junior standing. 305-630-0-0516

305 631. Labor Arbitration. (3) II. Role of arbitration and mediation in settling labor-management disputes. Intensive analytical probe into disputed areas including discipline, wages, discrimination and working conditions. Role playing and case research emphasized. Pr.: 305 630. 305-631-0-0501

305 632. Contemporary Issues in Labor Relations. (3) II. Research-oriented course concentrating on current critical issues in the labor-management field. Pr.: 305 630 or 225 620. 305-632-0-0516

305 640. Marketing Research. (3) II. 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.: 285 350, 285 351, 286 200 and 286 201 or 286 202, and 305 440. 305-640-0-0500

305 641. Business Logistics. (3) I. Operational analysis of the logistics system including locational analysis, inventory control, production scheduling and transportation. Utilizes concepts and techniques from economics and operations research to analyze logistics systems. Pr.: 285 350, 285 351, 286 200 and 286 201 or 286 202, and 305 421. 305-641-0-0500

305 642. Marketing Strategy. (3) I. Marketing policy formulation and implementation. Emphasis on developing students' ability to analyze and solve marketing problems by integrating knowledge in major marketing areas. Pr.: 305 640, or concurrent enrollment in 540 or 640. 305-642-0-0509

305 643. Promotional Administration. (3) II. Focuses on decisions made in managing the promotional mix. Relies on the concepts of economics, behavioral science and mathematics. Stresses analytical decision-making techniques in dealing with promotional problems. Pr.: 305 540. 305-643-0-0501

305 644. 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, i.e., international economic factors, foreign cultures, nationalism and government influences, economic development, etc. Pr.: Six hours of marketing.

305 650. Capital Budgeting. (3) I. 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.: 245 500, 285 350 and 305 450. 305-650-0-0501

305 651. Financial Management. (3) II. Analysis of problems in advanced financial planning and control. Pr.: 245 500, 285 350 and 305 450. 305-651-0-0501

305 653. Portfolio Management. (3) II. A theoretical and empirical synthesis of institutional investment decision-making. Concentrates on selecting the optimal investment set. Pr.: 245 220 or 500, 285 351 and 305 450. 305-653-0-0501

305 660. C.P.A. Problems. (3) I. A study of problems in various C.P.A. examinations. Pr.: 305 361 and 305 371. 305-660-0-0502

305 661. 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.: 305 292, 361 and 371. 305-661-0-0502

305 662. Auditing I. (3) I, II. Theory and procedures used in balance sheet audits. Pr.: 305 361 and 371. 305-662-0-0502

305 663. Auditing II. (3) II. Theory and procedure used in more complex balance sheet and detailed audits; a study of auditing questions as given in C.P.A. examinations, and review of current literature. Pr.: 305 662. 305-663-0-0502

305 665. Computer Applications in Accounting. (3) I. Study of the computer as an accounting tool. Emphasizes applications to custodial, performance and decision functions. Pr.: 286 200 and 201 or 202, and 12 hours of accounting. 305-665-0-0502

305 666. Public and Governmental Accounting. (3) II. Accounting for governmental units and not-for-profit organizations. Current problems in public reporting. Pr.: 305 361. 305-666-0-0502

305 676. Advanced Managerial Controls. (3) II. Control of operations through budgeting, cost analysis and income determination. Emphasizes use of accounting data for decision making. Pr.: 225 120, 305 360, 371 and 450. 305-676-0-0501

305 690. International Business. (3) On sufficient demand. Examination of business decision parameters and strategy in a foreign environment. Emphasis on aspects differing from the domestic area as they relate to marketing, management and financial decisions. Pr.: Senior standing. 305-690-0-0513

305 691. Business Measurements and Forecasting. (3) On sufficient demand. Analysis of business data, with emphasis on selection and the use of information for executive decisions. Topics include current economic indicators, forecasting techniques and business data sources. Pr.: 285 350. 305-691-0-0501

305 692. Application of the Computer in Business. (3) II. A study of computer solutions of business problems. Programs will be developed in Information Systems, Location, PERT, Inventory Control, Simulation and Finance. Pr.: 285 350, 286 200 and 286 201 or 286 202, and 305 421. 305-692-0-0501

305 695. Business Policy. (3) I, II, S. Integration of the subject matter of required courses in business and economics through study of the problems of policy formulation and administration. Cases are used as the basis of class discussion and written reports. Business simulation is used as an additional pedagogical technique. Pr.: Open only to graduating seniors and graduate students; 305 420, 440 and 450. 305-695-0-0501

305 696. Business and Society. (3) I, II, S. The impact of changes in the non-market environment on business; the relationship of business to social, economic and political forces. Pr.: Senior or graduate standing plus nine hours of credit in the social sciences. 305-696-0-0501

305 698. Problems in Business Administration. (Var.) I, II, S. Pr.: Background of courses needed for the problem undertaken. 305-698-3-0501

305 699. Problems in Accounting. (Var.) I, II, S. Pr.: Background of courses needed for the problem undertaken. 305-699-3-0502

305 770. Controllership. (3) I. Emphasis on control of operation through cost analysis, internal and external reporting, and income determination concepts. Pr.: 305 370. 305-770-0-0501

Graduate Credit

305 820. Behavioral Management Theory. (3) I, S. The development of the behavioral basis of individual and group functioning in business, governmental, educational and other organizations. Pr.: 305 420. 305-820-0-0506

305 840. Advanced Marketing Management. (3) II. An analytical approach to the study of marketing problems of business firms and other types of organizations. Attention on the influence of the marketplace and the marketing environment on marketing decision-making; the organization's products, and communication strategies; and the organization's system for planning and controlling its marketing effort. Pr.: Six hours of economics, three hours in marketing, three hours in statistics, and 245 500 or equivalent.

305 841. Special Topics in Marketing. (3) I. Investigation and discussion of contemporary issues, theories, and approaches affecting marketing policies. Pr.: 305 840 or six hours of marketing.

305 850. Financial Controls for Business. (3) II, S. The data necessary to judge economic flexibility and risk of investment proposals, cost of capital and capital structure are evaluated under static and dynamic assumptions regarding money and capital markets. Pr.: 305 450. 305-850-0-0506

305 860. Accounting Theory I. (3) I. An intensive treatment of problems related to corporation accounting and reporting, with emphasis on income determination and balance sheet valuation. Pr.: 21 hours of accounting. 305-860-0-0502

305 861. 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.: 21 hours of accounting. 305-861-0-0502

305 862. Tax Planning and Research. (3) I. Intensive examination of specific problems in taxation of partnership and corporate income, gift taxes and death taxes. Emphasis on research and tax planning. Pr.: 21 hours of accounting including 305 461. 305-862-0-0502

305 870. Accounting Controls for Business. (3) I. 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.: 225 120 and 305 260. 305-870-0-0502

305 890. Decision Theory of the Firm. (3) I. An integration of economic theory and operations research, with business decisions and application of these tools to management problems. Pr.: 225 120, 285 350 and 305 260. 305-890-0-0501

305 891. Legal and Social Environment of Business. (3) II. Problems affecting business, government and society are used to develop insight into the existence of business problems calling for judgments involving human and social values. Pr.: Consent of instructor. 305-891-0-0501

305 892. 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.: 285 350 and 305 420. 305-892-0-0503

305 893. Business Operations Analysis. (3) II. The use of quantitative decision models in business decisions; includes linear and dynamic programming, queuing, inventory control, simulation and multi-strategy game theory. Pr.: One course in calculus. 305-893-0-0501

305 894. 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.: 15 hours of B.A. courses at the 600 level or higher. 305-894-0-0501

305 898. Advanced Business Problems. Credit arranged. I, II, S. Intensive investigation of special business problems. Pr.: 21 hours of Business Administration courses at the 600 level or higher and sufficient training to complete the desired investigation. 305-898-3-0501

305 899. Thesis Research. (Var.) I, II, S. Pr.: Sufficient background to pursue line of research undertaken and consent of instructor. 305-899-4-0501



College of Education

Jordan Utsey, Dean
Jerry G. Horn, Assistant Dean
Vida E. Stanius, Assistant Dean
Margaret C. Bloomquist, Director, Student Personnel Services
Willard J. Nelson, Director, Pre-education Advisement Center
Roy A. Bartel, Coordinator of Field Experiences
Fred A. Teague, Director, Instructional Media Center
G. Kent Stewart, Director, Center for Extended Services and Studies

The College of Education is concerned with programs preparing individuals for the broad spectrum of educational positions in schools, colleges, business, industry, and in governmental agencies.

Primary consideration is given to: 1) the preparation of teachers for elementary schools and secondary schools, and for occupational and vocational programs, 2) the preparation of personnel to serve at various levels of administration in schools and colleges, 3) the training of supervisory personnel for curricular development and instructional improvement, 4) the preparation of persons for a wide variety of positions in counseling and guidance and in student personnel work, 5) the preparation of instructors for community colleges and four-year institutions, 6) the preparation of teachers and other personnel in the area of special education, 7) the preparation of teachers and other personnel in adult and continuing education, 8) the provision of consultative services and in-service training for the improvement of various aspects of educational programs at all levels.

The College of Education cooperates with all other colleges and departments at Kansas State University in its interdisciplinary approach to the preparation of teachers and other educational personnel.

The Kansas State University undergraduate Teacher Education Programs and the Master of Science and Doctor of Philosophy Degree Programs are accredited by the Kansas State Board of Education, North Central Association of Colleges and Secondary Schools, and National Council for Accreditation of Teacher Education.

The College of Education participates in the Intercollegiate program in Women's Studies, see page 43.

Center For Extended Services And Studies

The Center for Extended Services and Studies is operated by the College of Education, in response to the needs of schools in the State of Kansas and of education generally. The center provides a structure within which the college and the University can direct their resources toward working cooperatively with schools to develop and provide services and studies. The services and studies relate to the solution of educational problems and general improvement of education.

The center is staffed and maintained through the assignment of faculty members within the college, through contracts with faculty from K-State and other Kansas colleges and universities, and through the assignment of graduate students. The problem will determine the resources that will be coordinated through agreement.

Instructional Media Center

The Instructional Media Center provides a wide range of services, instructional materials and audiovisual equipment for faculty and students. 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 all 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 provided for use 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 wide variety of audio and video recorded teaching and individual study materials.

Facilities are available for group and individual uses of instructional media. Rooms are provided for group viewing of films and video tapes. An independent development laboratory is provided for the use of instructional materials on an individual basis. The laboratory includes learning spaces which are provided with all materials and equipment needed for totally individualized instruction.

Undergraduate Study

The curriculum in elementary education or secondary education at Kansas State University is a four-year program.

Pre-Education. For the freshman and sophomore years, students preparing to teach on either the elementary or secondary level will enroll in the appropriate pre-professional curriculum: elementary (402) or secondary (404). **Exceptions to the above:** Students majoring in agricultural education, home economics education, music education, and physical education must enroll in a curriculum within another college. Refer to the section on secondary education major fields.

Freshmen and sophomores are advised by a College of Education pre-education adviser in Room 110 Holton Hall. Refer to the section Bachelor of Science in Elementary Education, page 210, and Bachelor of Science, page 211 for further information.

Transfer Students. Students transferring as freshmen or sophomores will enroll in one of the pre-professional curricula as indicated in the pre-education paragraph. Students transferring as juniors or seniors (53 hours minimum) will enroll in elementary curriculum (410), elementary—special education—curriculum (411) or one of the appropriate secondary education curricula as indicated in the section entitled Secondary Education Major Fields.

Students planning to transfer to Kansas State University after one or two years at a junior college are encouraged to plan their degree programs in a four-year sequence. The faculty of the College of Education is available to advise students on the selection of courses which will meet Kansas State University degree requirements.

Students planning to transfer are invited to write to either the director of the pre-education advisement center, Holton Hall Room 110, or the director of student personnel services, Holton Hall Room 111.

Programs In Education

Adult Education. The adult education program is designed to develop competencies essential to persons working with adults. Graduates are qualified to be employed in continuing education, cooperative extension, community and junior colleges, technical schools, adult basic education, voluntary agencies, hospitals, industry, rehabilitation agencies, employment security, government, and other settings. The adult education bachelor's degree program is not to be used for vocational certification.

The program in adult education requires (1) general education studies, (2) professional education studies and (3) area of concentration as outlined in the section entitled Bachelor of Science Curriculum in Adult Education.

Teacher Education. The teacher education programs are designed to develop competencies essential for teaching. The programs in elementary education and in secondary education require (1) general education studies, (2) professional education studies and (3) major studies specifically outlined in the sections entitled Bachelor of Science in Elementary Education and Bachelor of Science Curricula in Secondary Education. All programs have met program approval by the Kansas State Department of Education.

All students wishing to teach in elementary or secondary schools must fully complete one of the approved programs.

Students completing a teacher education program in secondary education which may be part of requirements for a degree granted by another college at KSU must complete all requirements of the approved teacher education program. (See pages 210-218). Elementary education is a degree program in the College of Education only.

Admission To The Programs In Education

Adult Education. Any student intending to enter adult education must have the application for admission to adult education filed and approved before the student may enroll in any of the following courses:

405 315 Educational Psychology II
405 611 Educational Sociology
410 633 Practicum in Adult Education

The application for admission to the adult education program must be approved before a change into the adult education curriculum may be completed. The application forms are available in the Office of Student Personnel Services, College of Education, Holton Hall Room 111.

Teacher Education. Any student intending to teach in elementary or secondary schools must have the application for admission to a teacher education program filed and approved before the student may enroll in any of the following courses that may be in their program:

405 315 Educational Psychology II
415 316 Introduction to Instructional Media
415 470 Science for Elementary Schools
415 471 Language Arts for Elementary Schools
415 472 Social Studies for Elementary Schools
415 473 Mathematics for Elementary Schools
415 474 Elementary School Reading
also any course which is a part of the professional semester as listed on page 219.

The application forms are available in the Office of Student Personnel Services, College of Education, Holton Hall, Room 111.

Students in the College of Education will be transferred from the pre-professional to the professional program when the application for admission to teacher education programs has been approved.

Dates: (1) Students must apply by October 1 or February 15 of the sophomore year in the semester in which they earn 53 semester hours. The application for admission to a teacher education program and adult education must be filed two years prior to graduation. If this is not adhered to, students may experience difficulties in meeting certification requirements.

(2) Transfer students transferring 53 or more hours

from another institution should apply at the time of enrollment or pre-enrollment. Students transferring less than 53 hours will be required to complete a semester in residence.

Students making a change in teacher education programs should file an application for the new program.

Academic Standards Committee: The Academic Standards Committee of the College of Education must approve the application for admission to the teacher education programs.

Requirements for Admission to all Teacher Education Programs and Adult Education:

1. a. Over-all grade-point average of 2.2 in all resident work attempted at Kansas State University.
   b. The grade-point average requirements for students transferring to KSU will be based on all work attempted at previously attended institutions only when the application is filed at the time of initial enrollment.
2. A grade-point average of 2.5 in all resident work attempted at Kansas State University in the teaching field (as defined by the Certificate Handbook of the State of Kansas). This requirement does not apply to the elementary education and adult education majors. Transfer students will have the grade average based on all attempted work in the teaching field at previously-attended institutions only when the application is filed at the time of initial enrollment.
3. Passing English Composition I and II with a grade of "C" or better in one of the courses.
4. Grade of "C" or better in one of the following speech courses: 105, 106, 109, 220.

Provisional admission may be granted to an applicant who meets all requirements and whose over-all grade-point average is not below 2.0 and teaching field over-all grade-point average is not below 2.3.

Interruption of Degree

For students who interrupt their academic program, the question arises, "Can a student who has interrupted an academic career qualify for graduation by satisfactorily completing, upon return, the academic program existing at the time of their original entrance, even though the degree requirements have subsequently changed?"

This College of Education policy, addressing the above issue, applies to those persons seeking teacher education certification as well as those enrolled in degree programs in the College of Education.

Students who graduate within six (6) years from the time they enter Kansas State University 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 Sttate 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 their entry program if the Kansas State 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 the student 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 obtained credit as follows:

less than 30 credits	6 years allowed for completion
30 to 59 credits	5 years allowed for completion
60 to 89 credits	4 years allowed for completion
90 or more credits	3 years allowed for completion

Most students who interrupt their education for military service during peacetime do so by voluntary enlistment. In such a case the above policy would hold. In war-time 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.

Bachelor Of Science In Elementary Education

Students preparing to teach in the elementary school are enrolled in the pre-professional elementary curriculum (402) in the College of Education for the freshman and sophomore years. Freshmen and sophomores are advised by a College of Education pre-education adviser in Room 110, Holton Hall. The adviser is available for advising and counseling students concerning the courses essential for entry into the teacher education program.

All sophomores must make application for admission to the teacher education program. When the applications are approved, students are transferred into the teacher education professional program. Students are reassigned from a pre-education adviser to an elementary education adviser.

GENERAL EDUCATION REQUIREMENTS

Humanities ..... **minimum requirement 12 sem. hours**
Required: English Composition I & II. (A minimum grade of "C" is required in at least one of the courses.) A course in oral communication, (A minimum grade of "C" required) modern foreign language, linguistics, or literature.

Psychology ..... **minimum requirement one course**
Required: General Psychology, 273 110.

Social Sciences ..... **minimum requirement 9 sem. hours.**
(Psychology not included here. See general education electives below.) Required: Courses must be selected from anthropology, economics, geography (excluding 235 220 and 235 420), history, political science, sociology. The total of social sciences and general psychology must be a minimum of 12 sem. hours.

Natural Sciences ..... **minimum requirement 12 sem. hours**
Required: At least one biological science course, and at least one physical science course. One laboratory course.

Mathematics ..... **minimum requirement 3 sem. hours**
Course recommended: mathematics 245 508 "Topics in Mathematics for Elementary School Teachers." No mathematics may apply to the natural sciences requirement.

General Education Electives ..... **11 hours.**
Electives must be selected from any area included above and/or general religion, philosophy, art and music history, literature, appreciation of art, music and theatre, and humanities courses.

The minimum total hours required in general education **50**

Physical Education Requirement:
261 101 Concepts in Physical Education, 1 sem. hour

PROFESSIONAL AND SPECIALIZED COURSES REQUIRED

Following courses may be taken before student is admitted to the teacher education program.

405 215	Educational Psychology I	3
415 300	Principles of Elementary Education	3
209 170	Art for Elementary Schools	3
257 405	Music for Elementary Teachers	3
229 540	Literature for Children	3
261 201	Personal and Community Health	3
	OR	
261 369	PE for Elem. School Teachers	3

Student must be admitted to the teacher education program before enrolling in the following courses:

405 315	Educational Psychology II	3
415 316	Introduction to Instructional Media	1
415 470	Science for Elementary Schools	3
415 471	Language Arts for Elementary Schools	3
415 472	Social Studies for Elementary Schools	3
415 473	Mathematics for Elementary Schools	3
415 474	Elementary School Reading	3
405 611	Educational Sociology	3

Clinical Experiences:

415 585	Teaching Participation in Elementary School	8
415 600	Reading with Practicum	3
	(Becomes effective with December, 1978 graduates)	
	Total hours required in professional and specialized courses	51

AREA OF CONCENTRATION

The hours selected from the field of concentration are in addition to those taken to meet general education requirements. Concentrations are offered in the following fields:

biological sciences
health education
home economics
music and art
social science
English and speech
modern foreign language
physical sciences and mathematics
special education (learning disabilities, mental retardation, emotionally disturbed)
speech pathology

Total hours required in the area of concentration 15

ELECTIVES

Remaining hours in the degree may be taken as additional hours in the major, general education and related courses, and free electives.

Total hours required in electives 9

Total credit hours required for graduation 126

Bachelor Of Science

Curriculum in Adult Education. For the freshman and sophomore years, students who wish to teach or pursue careers as other personnel in adult education are enrolled in the pre-professional curriculum (401) in the College of Education. Freshmen and sophomores are advised by the College of Education pre-professional adviser in Room 110, Holton Hall. The adviser is available for advising and counseling students concerning the courses essential for entry into the adult education program.

All sophomores make application for admission into the adult education program. When students are accepted into the adult education curriculum (450), they are reassigned from the pre-professional adviser to an adult education adviser.

GENERAL EDUCATION REQUIREMENTS

Humanities ..... minimum requirement 12 sem. hours
Required: English Composition I & II (A minimum grade of "C" is required in at least one of the courses.) A course in oral communication, (A minimum grade of "C" required.) modern foreign language, linguistics, or literature.

Psychology ..... minimum requirement one course
Required: General Psychology, 273 110.

Social Sciences ..... minimum requirement 9 sem. hours
(Psychology not included here. See general education electives below.) Required: Courses must be selected from anthropology, economics, geography (excluding 235 220 and 235 420), history, political science, sociology. The total of social sciences and general psychology must be a minimum of 12 sem. hours.

Natural Sciences and Mathematics ..... minimum requirement 12 sem. hours
Required: At least one biological science course, and at least one physical science course. One laboratory course. A maximum of four hours of mathematics may apply, but not substitute for a physical science. Mathematics may include statistics or computer science.

General Education Electives ..... 14 hours
Electives must be selected from any area included above and/or general religion, philosophy, art and music history, literature, appreciation of art, music and theatre, and humanities courses.

The minimum total hours required in General Education 50

Physical Education Requirement:

261 101 Concepts in Physical Education, 1 sem. hour

PROFESSIONAL EDUCATION REQUIREMENTS

The following courses may be taken before student is admitted to the adult education curriculum:

410 680	Introduction to Adult Education	3
	Professional Education electives	25-28

A student must be admitted to the adult education curriculum before enrolling in the following three courses:

405 315	Educational Psychology II	3
405 611	Educational Sociology	3
410 633	Practicum in Adult Education	3-6
	Total hours required in professional education	40

AREA OF CONCENTRATION

The hours selected from the field of concentration are in addition to those taken to meet general education requirements and may not be professional education courses. Concentrations are offered in the following fields:

agriculture
art
architecture
business
computer science
economics
English and speech
engineering
family and child development
home economics
humanities
journalism & mass communications
modern languages
music
natural sciences
nursing
psychology
recreation and physical education
social sciences
statistics and mathematics
vocational (skill areas)

Total hours required in area of concentration 15

ELECTIVES 21

Total credit hours required for graduation 126

Curricula in Secondary Education. For the freshman and sophomore years, students preparing to teach in the secondary school are enrolled in the pre-professional secondary curriculum (404) in the College of Education. Exceptions are students majoring in agricultural education, home economics education, music education, and physical education. Refer to section on secondary education major fields.

Dual advisement is provided during the entire four years for all prospective secondary teachers. For the first two years students are advised by a College of Education pre-education adviser in Room 110, Holton Hall. In addition to the pre-education adviser, students are assigned to advisers in their majors who assist in the selection of courses in their majors and teaching fields.

All sophomores must make application for admission to the teacher education program. When the applications are approved, students are accepted into the College of Education professional program. Students are reassigned from the pre-education adviser to a secondary education adviser but retain their advisers in their major fields.

There are 22 subject fields applicable to teaching at the secondary level.

GENERAL EDUCATION REQUIREMENTS

Humanities ..... **minimum requirement 12 sem. hours**
Required: English Composition I & II. (A minimum grade of "C" is required in at least one of the courses.) A course in oral communication, (A minimum grade of "C" required.) modern foreign language, linguistics, or literature.

Psychology ..... **minimum requirement one course**
Required: General Psychology, 273 110.

Social Sciences ..... **minimum requirement 9 sem. hours**
(Psychology not included here. See general education electives below.) Required: Courses must be selected from anthropology, economics, geography (excluding 235 220 and 235 420), history, political science, sociology

Natural Sciences and Mathematics ..... **minimum requirement 12 sem. hours**
Required: At least one biological science course, and at least one physical science course. One laboratory course. A maximum of four hours of mathematics may apply, but not substitute for a physical science. Mathematics may include statistics or computer science.

General Education Electives ..... **14 sem. hours**
Electives must be selected from any area included above and/or general religion, philosophy, art and music history, literature, appeciation of art, music and theatre, and humanities courses.

The minimum total hours required in General Education **50**

Physical Education Requirement:

261	101	Concepts in Physical Education, 1 sem. hour

Professional Education Requirement:
The following course may be taken before student is admitted to the teacher education program:

405	215	Educational Psychology I	3

A student **must be admitted** to the teacher education program before enrolling in the following courses:

405	315	Educational Psychology II	3
415	316	Introduction to Instructional Media	1
405	611	Educational Sociology	3
415	451	Principles of Secondary Education	3
415	476	Methods of Teaching in the Secondary School	3

Clinical Experiences:

415	586	Teaching Participation in the Secondary School	8
		Total hours required in professional education	24

ELECTIVES

Remaining hours in the degree may be taken in additional hours in the major, general education and related courses, and free electives.

Total hours required in electives	credit variable
Total credit hours required for graduation	126

Secondary Education Major Fields And Approved Programs

AGRICULTURAL EDUCATION (AED 075)

Students planning to be agricultural education teachers must complete the approved program in agricultural education. These students will be enrolled in and receive their degrees from the College of Agriculture. See page 55.

ART EDUCATION (EAR 420)

Art	209	095	Art Assembly	0
Art	209	096	Art Education Sem.	0
Art	209	100	Design I	2
Art	209	190	Drawing I	2
Art	209	195	Survey Art History I	3
Art	209	196	Survey Art History II	3
Art	209	200	Design II	2
Art	209	210	Drawing II	2
Art	209	220	Water Color I	2
Art	209	225	Figure Drawing I	2
Art	209	230	Sculpture I	2
Art	209	235	Printmaking I	2
Art	209	245	Oil Painting I	2
Art	209	265	Ceramics I	2
Art	209	270	Metalsmithing and Jewelry	2
Art	209	545	Twentieth Century Art History I	3
Art	209	690	Techniques in Teaching Art	2
Art	209		Art electives	6
			Additional hours in one of the following specialized art subjects: oil, prints, ceramics, sculpture, art history, metalcrafts and jewelry, graphic design, drawing	6

Students preparing for K-12 certification must complete 209 170 and student teaching on both the elementary and secondary levels.

BUSINESS EDUCATION (EBU 421)

B.A.	305	110	Intermediate Typing	3
B.A.	305	111	Production Typing	3
B.A.	305	210	Office Machines	3
B.A.	305	260	Fund. of Accounting	4
B.A.	305	360	Inter. Accounting I	3
			OR	
B.A.	305	370	Manag. & Cost Contr.	3
B.A.	305	390	Business Law I	3
B.A.	305	310	Exec. Sec. Procedures	3
B.A.	305	311	Office Management	3
B.A.	305	392	Business Law II	3
B.A.	305	420	Management Concepts	3
B.A.	305	440	Marketing	3
B.A.	305	450	Business Finance	3
			OR	
Econ.	225	530	Money and Banking	3

Minimum of 6 hours from one of the following options:

B.A.	305	112	Shorthand I	4
B.A.	305	212	Intermediate Shorthand	3
B.A.	305	213	Transcription I	3
			OR	
B.A.	305		Additional hours of Accounting	6

Supporting courses required:

Econ.	225	110	Economics I	3
Econ.	225	120	Economics II	3
Pol. Sci.	269	325	U.S. Politics	3
Soc.	277	211	Intro. to Sociology	3
Math.	245	100	College Algebra	3
C. Sci.	286	200	Fund. of Computer Programming	2
C. Sci.	286		A language lab	1
Fam. Econ.	630		Family Economics electives	3

ENGLISH (EEO 422)

Two of the following four courses:

Engl.	229	260	E. British Survey I	3
Engl.	229	265	E. British Survey II	3
Engl.	229	280	American Survey I	3
Engl.	229	285	American Survey II	3
Engl.	229	250	Forms of Literature	3
Engl.	229	400	Advanced Comp.	3
Engl.	229	530	Modern English Grammar	3
Engl.	229	545	Literature for Adolescents	3
Engl.	229	350	Intro. to Shakespeare	3
			OR	
Engl.	229	716 or 717	Shakespearean Drama I or II	3
Engl.	229		Literature electives, at 600 level and above	9

If two American surveys, must take one British course; if two British surveys, must take six hours of American literature.

Engl.	229		English electives	6

May include one introduction to Genre (310, 320, 330, 340, or 350) or third survey course.

For English majors who need 12 hours for certification to teach journalism, the following courses are suggested:

Journ.	289	275	Reporting I	3
Journ.	289	285	Reporting II	3
Journ.	289	330	Editing I	3
Journ.	289	665	Law of Mass Communications	3

HEALTH EDUCATION (HPR 275)

Students planning to be health education teachers will be enrolled in and receive their degrees from the College of Arts and Sciences. See page 134.

HOME ECONOMICS EDUCATION (HED 672)

Students planning to be vocational home economics teachers must complete the approved program in vocational home economics education. Students will be enrolled in and receive their degrees from the College of Home Economics. See page 273. Completion of this program satisfies State of Kansas requirements for vocational home economics certification.

JOURNALISM (EJO 423)

Journ.	289	275	Reporting I	3
Journ.	289	285	Reporting II	3
Journ.	289	330	Editing I	3
Journ.	289	665	Law of Mass Communications	3

18 hours of Journalism electives; the following courses are suggested:

Journ.	289	310	Photography I	3
Journ.	289	320	Principles of Advertising	3
Journ.	289	335	Editing II	3
Journ.	289	360	Publications Practice	1-4
Journ.	289	510	Yearbook Editing and Management	2
Journ.	289	555	Advertising Copy and Layout	3
Journ.	289	605	Supervision of School Publications	3

Journ.	2B9 610	Interpretation of Contemp. Affairs	3
Journ.	2B9 660	History of Journalism	3
Journ.	2B9 6B5	MC Ethics and Issues	3

MATHEMATICS (EMA 424)

Math.	245 220	Analytic Geom. and Calc. I	4
Math.	245 221	Analytic Geom. and Calc. II	4
Math.	245 222	Analytic Geom. and Calc. III	4
Math.	245 240	Series and Differential Equations	4

18 hours of mathematics courses numbered 400-799; the following courses are recommended:

Math.	245 511	Intro. to Algebraic Systems	3
Math.	245 512	Intro. to Modern Algebra I	3
Math.	245 513	Intro. to Modern Algebra II	3
Math.	245 570	History of Mathematics	3
Math.	245 572	Modern Geometry	3
Math.	245 612	Finite Appl. of Math.	3
Math.	245 619	Foundations of Analysis	3
Math.	245 717	The Real Number System	3
Math.	245 771	Transformation and Vector Geometry	3
Math.	245 791	Topics in Mathematics for Secondary School Teachers	3

Supporting courses required:

Stat.	285 320	Elements of Statistics	3
		OR	
Stat.	2B5 510	Introductory Probability and Statistics I	3

It is recommended that a course in physics and a course in computer programming be included as part of general education.

MODERN LANGUAGES (EML 425)

FRENCH:

Required: 30 hours at 200 level or above to include the following:

Mod. Lang.	253 211	French III	4
Mod. Lang.	253 213	French IV	3
Mod. Lang.	253 214	French Conversation IVA	2
Mod. Lang.	253 511	Survey Fr. Literature I	3
Mod. Lang.	253 512	Survey Fr. Literature II	3
Mod. Lang.	253 513	French Composition and Conversation	3
Mod. Lang.	253 514	French Civilization	3
Mod. Lang.	253 719	Advanced French Syntax	3
Mod. Lang.	253	French electives at 200 and above	6

GERMAN:

Required: 30 hours at 200 level or above to include the following:

Mod. Lang.	253 221	German III	4
Mod. Lang.	253 223	German IV	3
Mod. Lang.	253 224	German Conversation IVA	2
Mod. Lang.	253 521	Intro. German Literature I	3
Mod. Lang.	253 522	Intro. German Literature II	3
Mod. Lang.	253 523	German Composition	3
Mod. Lang.	253 530	German Civilization	3
Mod. Lang.	253 731	Advanced Spoken and Written German	3
Mod. Lang.	253	German electives at 200 and above	6

SPANISH:

Required: 30 hours at 200 level or above to include the following:

Mod. Lang.	253 261	Spanish III	4
Mod. Lang.	253 263	Spanish IV	3
Mod. Lang.	253 264	Elementary Spanish Conversation IVA	2
Mod. Lang.	253 564	Spanish Composition and Grammar	3
Mod. Lang.	253 565	Spanish Civilization	3
		OR	
Mod. Lang.	253 566	Hispanic-American Civilization	3
Mod. Lang.	253 570	Adv. Spanish Composition and Grammar	2
Mod. Lang.	253 571	Adv. Spanish Conversation	2
Mod. Lang.	253	Spanish electives at 200 and above	5

Minimum of 6 hours from the following options:

Mod. Lang.	253 561	Spanish Literature I	3
Mod. Lang.	253 562	Spanish Literature II	3
Mod. Lang.	253 563	Spanish-American Masterpieces	3
Mod. Lang.	253 567	Spanish Masterpieces	3

A second teaching field is recommended.

Elective courses in the following areas are recommended: speech (linguistics), history, anthropology, and philosophy.

Early experience as a teacher's aide is recommended. Make arrangements with Modern Language education adviser.

MUSIC EDUCATION (MEO 272)

Students planning to be music education teachers must complete the approved program in music education. These students will be enrolled in and receive their degrees from the College of Arts and Sciences. See page 164.

PHYSICAL EDUCATION (HPR 276)

Students planning to be physical education teachers must complete the approved program in physical education. These students will be enrolled in and receive their degrees form the College of Arts and Sciences. See page 135.

PSYCHOLOGY (EPY 426)

Psych.	273 110	General Psychology	3
Psych.	273 250	Experimental Methods in Psychology	4
Psych.	273 520	Personality Development	3
Psych.	273 535	Social Psychology	3
Psych.	273 460	Information Processing and Memory	3
		OR	
Psych.	273 475	Principles of Learning and Motivation	3
		OR	
Psych.	273 4B0	Fundamentals of Perception and Sensation	3
Psych.	273	Psychology electives (excluding Ed. Psych. I & II)	2

Supporting courses required:

Stat.	285 320	Elements of Statistics	3
		OR	
Stat.	285 330	Stat. for Soc. Sci. Majors	3
A&F	405 715	Principles of Measurement	3
A&F	405 721	Mental Hygiene in the School and Community	3

Completion of a second teaching field based on College of Education requirements

SPEECH (ESP 429)

30 hours in Speech to include the following:

A. 21 hours from one of the following major areas of interest.

Speech	2B1	General Speech
Speech	282	Linguistics
Speech	283	Speech Pathology/Audiology
Speech	284	Theatre and Interpretation

B. 9 hours in speech courses outside the major area of interest.

Note: To satisfy Kansas State certification requirements, each candidate must complete one course in each of the following four areas

Speech	281	Public speaking
Speech	281	Discussion and debate
Speech	284	Theatre
Speech	284	Oral interpretation

Natural Science Majors

BIOLOGICAL SCIENCE (EBI 430)

Biol.	215 198	Principles of Biology	4
Biol.	215 201	Organismic Biology	5
Biol.	215 555	Microbiology	4
Biol.	215 303	Ecosystems and Society	3
		OR	
Biol.	215 529	Fundamentals of Ecology	3
		OR	
Biol.	215 631	Ecology	3
AS&t	020 500	Genetics	3
		OR	
Biol.	215 650	Molecular Genetics	3

8 hours of biology electives: Many different biology courses may be used but it is strongly suggested that the following courses be considered:

Entom.	030 312	Gen. Entomology	2
Entom.	030 313	Gen. Entomology lab.	1
Biol.	215 310	Biology and the Future of Man	3
Biol.	215 440	Cell-Oevelop. Biol.	5
Biol.	215 560	Evolutionary Biology	2

Chemistry Courses Required:

Chem.	221 210	Chemistry I	4
Chem.	221 230	Chemistry II	4
Chem.	221 240	Environ. Chem. Lab.	1
Chem.	221 350	General Organic Chemistry	3

Other Required Courses:

Geol.	234 512	Earth Science	3
Geol.	234 130	El. Geo. Lab.	1
Phys.	265 115	Descriptive Physics	4
C&I	415 614	Lab Techniques	3

CHEMISTRY (ECH 431)

Chem.	221 210	Chemistry I	4
Chem.	221 230	Chemistry II	4
Chem.	221 271	Chemical Analysis	4
Chem.	221 350	Gen. Organic Chemistry	3
Chem.	221 351	Gen. Organic Chemistry Lab.	2
Chem.	221 500	Descriptive Phys. Chemistry	3
Chem.	221	Chemistry electives	5

Supporting courses required:

Biol.	215 198	Principles of Biology	4
Biol.	215 201	Organismic Biology	5
Math.	245 220	Analytic Geom. & Calc. I	4
Math.	245 221	Analytic Geom. & Calc. II	4
Phys.	265 113	General Physics I	4
Phys.	265 114	General Physics II	4
C&I	415 614	Lab Techniques	3

Additional courses highly recommended:

Math.	245 222	Analytic Geom. & Calc. III	4
Chem.	221 799	Problems in Chemistry	Credit Variable

EARTH SCIENCE (EEA 432)

Geol.	234 100	Geology I	3
Geol.	234 130	Elem. Geol. Lab.	1
Geol.	234 512	Earth Science	3
Geol.	234 520	Geomorphology	4
Geol.	234 502	Mineralogy and Petrology I	4
Geog.	235 220	Environmental Geography I	4

Supporting courses required:

Biol.	215 198	Principles of Biology	4
Biol.	215 201	Organismic Biology	4
Chem.	221 210	Chemistry I	4
Chem.	221 230	Chemistry II	4
Chem.	221 240	Environ. Chem. Lab.	1
Math.	245 100	College Algebra	3
Math.	245 150	Plane Trigonometry	3
Phys.	265 113	General Physics I	4
Phys.	265 114	General Physics II	4
Phys.	265 191	Descriptive Astronomy	3
Phys.	265 193	Descriptive Meteorology	3
C&I	415 614	Lab Techniques	3

PHYSICAL SCIENCE (EPS 434)

Phys.	265 113	General Physics I	4
Phys.	265 114	General Physics II	4

6 hours physics electives selected from the following:

Phys.	265 191	Descriptive Astronomy	3
Phys.	265 193	Descriptive Meteorology	3
Phys.	265 636	Phys. Meas. Instr.	4
Phys.	265 506	Physics Lab. I	3
Phys.	265 551	Atomic Physics	3
		OR	
Phys.	265 451	Modern Physics	3

Note: Kansas physics certification requires at least one physics course that specifies Physics II as a prerequisite.

Supporting courses required:

Chem.	221 210	Chemistry I	4
Chem.	221 230	Chemistry II	4
Chem.	221 240	Environ. Chem. Lab.	1
Chem.	221 350	General Organic Chem.	3
Chem.	221 351	General Organic Chem. Lab.	2
Geol.	234 100	Geology I	3
Geol.	234 130	El. Geol. Lab.	1
Geol.	234 512	Earth Science	3
Biol.	215 198	Principles of Biology	4
Biol.	215 201	Organismic Biology	4
Math.	245 220	Analytic Geom. and Calc. I	4
Math.	245 221	Analytic Geom. & Calc. II	4
C&I	415 614	Lab. Techniques	3

PHYSICS (EPH 435)

Phys.	265 017	Colloquium in Physics	0
Phys.	265 213	Engineering Physics I	5
Phys.	265 214	Engineering Physics II	5
Phys.	265 506	Physics Lab. I	3
Phys.	265 522	Mechanics I	3
Phys.	265 532	Electricity and Magnetism	3
Phys.	265 551	Atomic Physics I	3
Phys.	265 636	Phys. Meas. Instr.	4

Supporting courses required:

Biol.	215	one biology course (selection must be approved by the education adviser)	3-4
Chem.	221 210	Chemistry I	4
Chem.	221 230	Chemistry II	4
Chem.	221 240	Environ. Chem. Lab.	1
Math.	245 220	Analytic Geom. & Calc. I	4
Math.	245 221	Analytic Geom. & Calc. II	4
Math.	245 222	Analytic Geom. & Calc. III	4
Math.	245 240	Series & Differential Equations	4
C&I	415 614	Lab Techniques	3

Additional courses highly recommended:

Geol.	234 512	Earth Science	3
Geol.	234 130	El. Geol. Lab.	1

Social Science Majors

ECONOMICS (EEC 437)*

Econ.	225 110	Economics I	3
Econ.	225 120	Economics II	3
Econ.	225 510	Inter. Macroeconomics	3
Econ.	225 520	Inter. Microeconomics	3

15 hours of economics courses numbered 500 and above, selected with advice of economics and education advisers.

Supporting courses required:

Geog.	235 100	World Regional Geography	3
		OR	
Geog.	235 440	Geography of Natural Resources	3
		OR	
Geog.	235 450	Geography of Economic Behavior	3
Hist.	241 251	U.S. History to 1877	3
Hist.	241 252	U.S. History since 1877	3
Math.	245 100	College Algebra	3
Pol. Sci.	269 110	Principles of Pol. Sci.	3
Soc.	277 211	Intro. to Sociology	3
Stat.	285 350	Bus & Econ. Stat. I	3
		OR	
Stat.	285 330	Elem. Stat. for Soc. Sci.	3

One of the following four courses:

B.A.	305 260	Fund. of Accounting	4
Math.	245 220	Analytic Geom. & Calc. I	4
Math.	245 500	Intro. to Analytic Processes	3
Stat.	285 351	Bus. & Econ. Stat. II	3

Social Science electives:

Hist.	241	Additional courses in U.S. History	6
		OR	
Pol. Sci.	269	Political Science courses	9

GEOGRAPHY (EGO 436)*

Geog.	235 100	World Regional Geog.	3
		OR	
Geog.	235 200	Man Space Environ.	3
Geog.	235 220	Environmental Geog. I	4

Any two of the following three courses:

Geog.	235 420	Environmental Geog II	4
Geog.	235 440	Geography of Natural Resources	3
Geog.	235 450	Geography of Economic Behavior	3
Geog.	235 470	Cartography	3
Geog.	235 480	Pro-Seminar in Geography	2
Geog.	235	Additional Geography courses 600 level and above	9

Supporting courses required:

Hist.	241 101	Rise of Europe	3
Hist.	241 102	Modern Era	3
Hist.	241 251	U.S. History to 1877	3
Hist.	241 252	U.S. History since 1877	3
Pol. Sci.	269 110	Principles of Pol. Sci.	3
Soc.	277 211	Intro. to Sociology	3

Social Science electives:

Hist.	241	Additonal courses in U.S. History	6
		OR	
Pol. Sci.	269	Political Science courses	9

HISTORY (EHI 438)*

Hist.	241 101	Rise of Europe	3
Hist.	241 102	Modern Era	3
Hist.	241 251	U.S. History to 1877	3
Hist.	241 252	U.S. History since 1877	3
Hist.	241 397	Junior Seminar	3
Hist.	241 599	Senior Seminar	3
		OR	
Hist.	241	Approved alt. above 500	3

12 hours of courses numbered 500 and above distributed in three of the following fields:
(a) ancient, medieval and early modern Europe
(b) modern Europe including Britain
(c) third world (Asia, Africa, Latin America)
(d) The United States
(e) history of science, history of technology, military history

Supporting courses required:

Econ.	225 110	Economics I	3
Geog.	235 100	World Regional Geog	3
Pol. Sci.	269 110	Principles of Pol. Sci.	3
Pol. Sci.	269	Pol. Sci. elective	3
Soc.	277 211	Intro. to Sociology	3

POLITICAL SCIENCE (EPL 439)*

Pol. Sci.	269 110	Introduction to Pol. Sci.	3
Pol. Sci.	269	Political Science courses	21

Supporting courses required:

Econ.	225 110	Economics I	3
Geog.	235 100	World Regional Geography	3
Hist.	241 101	Rise of Europe	3
Hist.	241 102	Modern Era	3
Hist.	241 251	U.S. History to 1877	3
Hist.	241 252	U.S. History since 1877	3
Soc.	277 211	Intro. to Sociology	3

SOCIOLOGY (ESO 440)*

Soc.	277 211	Intro. to Sociology	3
Soc.	277 520	Methods of Soc. Res. I	4
Soc.	277 511	Comparative Soc. Theory	3
Soc.	277	Sociology electives 400 level and above	9**
Soc.	277	Sociology electives numbered 500-799	9**
Social Science electives (all either U.S. hist. or pol. sci.)			6

Supporting courses required:

Econ.	225 110	Economics I	3
Geog.	235 100	World Regional Geog.	3
Hist.	241 251	U.S. History to 1877	3
Hist.	241 252	U.S. History since 1877	3
Pol. Sci.	269 110	Principles of Pol. Sci.	3
Pol. Sci.	269	Political Science elective	3**
Stat.	285 320	Elements of Statistics	3

*Note: At least 12 hours of U.S. history or 12 hours of political science or 12 hours of world history must be completed prior to student teaching.
**Selected in consultation with education adviser.

Second Teaching Fields For All Secondary Education Majors

All students in teacher education, or all graduates of teacher education, intending to qualify for a second teaching field in the secondary school must complete all requirements of the approved program for the second teaching field. Kansas State University will recommend certification in a second teaching field when all requirements of the approved program have been completed.

The second teaching field gives the individual a sound core of courses with a minimum in quantity of hours but a maximum in quality of subject matter background. The second teaching field requirements are in some areas more than the minimum required by the Kansas State Department of Education certification standards.

Approved Programs in Second Teaching Fields:

VOCATIONAL AGRICULTURE

To be recommended for certification in vocational agriculture, students must complete the approved program in vocational agriculture.

ART

Art	209 100	Design I	2
Art	209 200	Design II	2
Art	209 190	Drawing I	2
Art	209 210	Drawing II	2
Art	209 235	Printmaking I	2
Art	209 220	Water Color Painting	2
Art	209 245	Painting I	2
Art	209 230	Sculpture I	2
Art	209 265	Ceramics I	2
Art	209 195	Survey Art History I	3
Art	209 196	Survey Art History II	3
Art	209 545	Twentieth Century Art History I	3
Six additional hours in an area of concentration in one of the following areas: painting, printmaking, sculpture, metals, drawing, graphic design, ceramics			6
Art	209	Art electives (Studio or Art History)	3
C&I	415 476	Methods of Teaching in the Secondary Schools	3
		Total hours required	33

BUSINESS

B.A.	305 110	Intermediate Typing	3
B.A.	305 111	Production Typing	3
B.A.	305 260	Fundamentals of Accounting	4
B.A.	305 360	Intermediate Accounting I	3
		OR	
B.A.	305 370	Manag. Cost Accounting	3
Option A Shorthand (Minimum 6 hours)			
B.A.	305 112	Shorthand	3
B.A.	305 212	Intermediate Shorthand	3
B.A.	305 213	Transcription I	3
Option B Accounting (6 additional hours)			
B.A.	305 210	Office Machines	3
B.A.	305 310	Exec. Sec. Procedures	3
B.A.	305 390	Business Law I	3
B.A.	305 392	Business Law II	3
Include in General Education			
Econ.	225 110	Economics I	3
Econ.	225 120	Economics II	3
		Total hours required	25

This prepares a student to teach typing, office practice, business law, bookkeeping, and shorthand if Option A is selected.

ENGLISH

Engl.	229 370	American Literature I	3
Engl.	229 375	American Literature II	3
		OR	
Engl.	229 280	American Survey I	3
Engl.	229 280	American Survey II	3
Engl.	229 400	Advanced Composition	3
Engl.	229 530	Modern English Grammar	3
Engl.	229	Electives	12
Engl.	281 106/107	Oral Communication	3
		Total hours required	36

9 additional hours in: composition, literature, study of the English language, speech, theatre, journalism, and teaching of reading.

It is recommended that students complete:
6 hrs. British Literature
3 hrs. Literature for Adolescents
3 hrs. Shakespeare course

JOURNALISM

Journ.	289 275	Reporting I	3
Journ.	289 285	Reporting II	3
Journ.	289 330	Editing I	3
Journ.	289 665	Law of Mass Communications	3
		Total hours required	12

HEALTH

HPER	261 201	Personal & Community Health	3
HPER	261 206	Professional Orientation	1
HPER	261 583	Current Health Issues	3
		OR	
HPER	261 550	Health Appraisal	3
HPER	261 376	First Aid Multimedia	1
		OR	
HPER	261 377	First Aid Multi. Instr.	1
HPER	261 765	Human Sexuality	3
		OR	
HPER	261 250	You and Your Sexuality	3
HPER	261 385	Consumer Health & Quackery	3
HPER	261 555	Community Health	3

(Required, but is not included as part of the health requirements.)

Bio.	215 240	Structure and Function of Human Body	6
		Total hours required	21

VOCATIONAL HOME ECONOMICS

To be recommended for certification in vocational home economics, students must complete the approved program in vocational home economics.

MATHEMATICS

Math.	245 220	Analytic Geometry & Calculus I	4
Math.	245 221	Analytic Geometry & Calculus II	4
Math.	245 222	Analytic Geometry & Calculus III	4
Math.	245 771	Transformation & Vector Geometry	3
Math.	245 511	Introduction to Algebraic Systems	3
		OR	
Math.	245 512	Introduction to Modern Algebra	3

Six semester hours of electives chosen from the following:

Math.	245 240	Series & Differential Equations	4
Math.	245 570	History of Mathematics	3
Math.	245 612	Finite Applications of Mathematics	3
Math.	245 619	Foundations of Mathematics	3
Math.	245 717	The Real Number System	3

Supporting Courses Required:

Stat.	285 320	Elements of Statistics	3
		Total hours required	27

Supporting Courses Recommended: A course in computer science. A course in physics.

MODERN FOREIGN LANGUAGE

FRENCH:

24 hours in French at 200 level or above, to include:

Mod. Lang.	253 211	French III	4
Mod. Lang.	253 213	French IV	3
Mod. Lang.	253 214	French Conversation IVA	2
Mod. Lang.	253 511	Survey French Literature I	3
		OR	
Mod. Lang.	253 512	Survey French Literature II	3
Mod. Lang.	253 513	French Composition & Conversation	3
Mod. Lang.	253 514	French Civilization	3
Mod. Lang.	253	French electives at 500 or above	6

GERMAN:

24 hours in German at 200 level or above, to include:

Mod. Lang.	253 221	German III	4
Mod. Lang.	253 223	German IV	3
Mod. Lang.	253 224	German Conversation IVA	2
Mod. Lang.	253 521	Intro. German Literature I	3
		OR	
Mod. Lang.	253 522	Intro. German Literature II	3
Mod. Lang.	253 523	German Composition	3
Mod. Lang.	253 530	German Civilization	3
Mod. Lang.	253	German electives at 500 or above	6

SPANISH:

24 hours in Spanish at 200 level or above, to include:

Mod. Lang.	253 261	Spanish III	4
Mod. Lang.	253 263	Spanish IV	3
Mod. Lang.	253 264	Elementary Spanish Conversation IVA	2
Mod. Lang.	253 564	Spanish Composition and Grammar	3
Mod. Lang.	253 565	Spanish Civilization	3
		OR	
Mod. Lang	253 566	Hispanic-American Civilization	3
Mod. Lang	253	Spanish electives at 500 or above	6

Minimum of three hours from the following:

Mod. Lang	253 561	Spanish Literature I	3
Mod. Lang	253 562	Spanish Literature II	3
Mod. Lang.	253 563	Spanish-American Masterpieces	3
Mod. Lang.	253 567	Spanish Masterpieces	3

Additional requirements:

C&I	415 476	Methods of Teaching in the Secondary School—Foreign Language	3
C&I	415 586	Teaching Participation in the Secondary School. (May be completed in conjunction with the major field	Variable Cr.

MODERN FOREIGN LANGUAGE ELEMENTARY SCHOOL

Certification to teach elementary school foreign language is an optional extension of secondary school certification. The following must be completed in addition to the requirements for secondary modern foreign language certification:

C&I	415 686	Topics: Method of Elementary Foreign Language	3
C&I	415 585	Teaching Participation Elementary School	4

SECONDARY INSTRUMENTAL MUSIC

Music	257	Styles I-IV (#175, 176, 214, 215)	16
Music	257	Instrument	4
Music	257	Music Organizations (If band-2 hrs Marching and 2 hrs regular; if orchestra 4 hrs in Orchestra)	4
Music	257 417	Conducting	2
Music	257 514	Secondary School Instrumental Music	2
Music	257	Instructional Techniques (#427 or 428 or 429)	4
		Total hours required	32

SECONDARY VOCAL MUSIC

Music	257	Styles I-IV (#175, 176, 214, 215)	16
Music	257	Piano	2
Music	257	Voice	4
Music	257	Vocal Organizations	4
Music	257 417	Conducting	2
Music	257 513	Secondary School Vocal Music	2
		Total hours required	30

SECONDARY VOCAL AND INSTRUMENTAL MUSIC

Music	257	Styles I-VI (#175, 176, 214, 215, 406, 407)	24
Music	257 417	Conducting	2
Music	257	Voice	4
Music	257	Instrument	4
Music	257	Piano	2
Music	257 513	Secondary School Vocal Music	2
Music	257 514	Secondary School Instrumental Music	2
Music	257	Instructional Techniques (#427 or 42B or 429)	4
Music	257	Music Organizations (any combination; both must be represented	4
		Total hours required	48

BIOLOGY

Core:

Bio.	215 198	Principles of Biology	4
Bio.	215 201	Organismic Biology	5
Bio.	215 303	Ecosystems and Society	3
		OR	
Bio.	215 529	Fundamentals of Ecology	3
Chem.	221 110	General Chemistry	3
		OR	
Chem.	221 210	Chemistry I	4

Plus a minimum of nine semester hours chosen from the following:

Bio.	215 310	Biology and the Future of Man	3
Ent.	030 312	General Entomology	2
Ent.	030 313	General Entomology Lab.	1
Bio.	215 430	Population Biology	4
		OR	
AS&I	020 500	Genetics	3
Bio.	215 555	Microbiology	4

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, 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:

C&I	415 614	Lab Techniques	3
Chem.	221 230	Chemistry II	4
Phys.	265 115	Descriptive Physics	4
Geol.	234 512	Earth Science	3

CHEMISTRY

Chem.	221 210	Chemistry I	4
Chem.	221 230	Chemistry II	4
Chem.	221 271	Chemical Analysis	4
Chem.	221 350	General Organic Chemistry	3
Bio.	215 198	Principles of Biology	4
Phys.	265 113	General Physics I	4
		OR	
Phys.	265 115	Descriptive Physics	4

Plus a minimum of three semester hours chosen from the following:

Bio.	215 201	Organismic Biology	5
Chem.	221 500	Descriptive Physical Chemistry	3
Geol.	234 512	Earth Science	3
Geol.	234 100	Geology I	3
Phys.	265 114	General Physics II	4
Phys.	265 191	Descriptive Astronomy	3
Phys.	265 193	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 designed to meet the needs of curricula other than the classical natural sciences would **not** satisfy the requirements.

Highly recommended, but not required.

C&I	415 614	Lab Techniques	3
Math.	245 220	Analytic Geometry & Calculus I	4

EARTH SCIENCE OR PHYSICAL SCIENCE

Core:

Geol.	234 512	Earth Science	3
Geol.	234 100	Geology I	3
Geol.	234 130	Elementary Geology Lab	1
Bio.	215 198	Principles of Biology	4
Chem.	221 210	Chemistry I	4
Phys.	265 113	General Physics I	4
		OR	
Phys.	265 115	Descriptive Physics	4

Plus a minimum of two courses chosen from the following:

Geol.	234 200	Geology II	4
Geol.	234 502	Mineralogy & Petrology	4
Geol.	234 520	Geomorphology	4
Geol.	234 105	Oceanography	3
Phys.	265 191	Descriptive Astronomy	3
Phys.	265 193	Descriptive Meteorology	3

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 designed for curricula other than the classical natural sciences would **not** satisfy the requirements.

Highly recommended, but not required.

Geog	235 220	Environmental Geography I	4
C&I	415 614	Lab. Techniques	3

GENERAL SCIENCE

Core:

Bio.	215 19B	Principles of Biology	4
Chem	221 110	General Chemistry	5
		OR	
Chem.	221 210	Chemistry I*	4
Geol.	234 512	Earth Science	3
Phys	265 113	General Physics I	4
		OR	
Phys	265 115	Descriptive Physics	4

*Required for Chemistry and Physics options.

Plus one of the following options.

Biology

Bio.	215 201	Organismic Biology	5
Bio.	215 303	Ecosystems and Society	3
		OR	
Bio.	215 529	Fundamentals of Ecology	3

Chemistry

Chem.	221 230	Chemistry II	4
Chem.	221 271	Chemical Analysis	4
		OR	
Chem	221 350	General Organic Chemistry	3
		AND	
Chem	221 351	General Organic Chemistry Lab	2

Physics

Phys.	265 114	General Physics II	4
Phys.	265	One physics course that has Physics II as a prerequisite	
Phys.	265	Plus enough physics department credit to total at least 12 semester hours	4 (minimum)

Earth Science

Geol.	234 100	Geology I	3
Geol.	234 130	Elementary Geology Lab	1

Plus at least two courses selected from the following:

Geol.	234 105	Oceanography	3
Geol.	234 200	Geology II	4
Geol.	234 502	Minerology & Petrology	4
Geol.	234 520	Geomorphology	3
Phys.	265 191	Descriptive Astronomy	3
Phys.	265 193	Descriptive Meterology	3

Highly recommended, but not required:

C&I	415 614	Lab Techniques	3

Each student seeking second field certification recommendation in general science must select any necessary coursework required to bring the total natural science credits to 24 semester hours from the above.

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 designed to meet the needs of curricula other than the classical natural science would **not** satisfy the requirements.

PHYSICS

Phys.	265 113	General Physics I	4
Phys.	265 114	General Physics II	4
Chem.	221 210	Chemistry I	4
Chem.	221 230	Chemistry II	4

Plus a minimum of three semester hours chosen from the following:

Phys.	265 506	Physics Lab I	3
Phys.	265 515	Physics for Science Teachers	2-3
Phys.	265 451	Modern Physics	3
		OR	
Phys.	265 551	Atomic Physics	3
Phys.	265 636	Physical Measurements Instrumentation	4

Plus a minimum of three semester hours chosen from one of the following:

Phys.	265 191	Descriptive Astronomy	3
Phys.	265 193	Descriptive Meterology	3

Plus a minimum of three semester hours chosen from one of the following:

Geol.	234 512	Earth Science	3
Geol.	234 100	Geology I	3
Bio.	215 198	Principles of Biology	4
Bio.	215 303	Ecosystems and Society	3
Bio.	215 310	Biology and the Future of Man	3
Chem.	221 350	General Organic Chemistry	3
Chem.	221 500	Descriptive Physical Chemistry	3

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 designed to meet the needs of curricula other than the classical natural sciences would **not** satisfy the requirements.

Highly recommended, but not required:

C&I	415 614	Lab Techniques	3
Math.	245 220	Analytic Geometry & Calculus I	4
Math.	245 221	Analytic Geometry & Calculus II	4

SOCIAL SCIENCE

A minimum of 36 hours is required, 24 of which shall consist of the following core:

Core:

Econ.	225 110	Economics I	3
Hist.	241 102	Modern Era	3
Hist.	241 251	U.S. to 1877	3
Hist.	241 252	U.S. Since 1877	3
Geog.	235 100	World Regional Geography	3
Pol. Sci.	269 110	Principles of Political Science	3
Soc.	277 211	Introduction to Sociology	3
Hist.	241 101	Rise of Europe	3
		OR	
Pol. Sci.	269 325	U.S. Politics	3

Students in addition to completing the core must choose hours from the following areas to meet certification requirements.

ECONOMICS

Required:

Econ.	225 120	Economics II	3

Three additional hours from among the following courses or equivalent courses acceptable to the education adviser.

Econ.	225 520	Money and Banking	3
Econ.	225 532	Fiscal Operations of State and Local Government	3
Econ.	225 555	Urban & Regional Economics	3
Econ.	225 620	Labor Economics	3
Econ.	225 631	Principles of Transportation	3
Econ.	225 636	Capitalism & Socialism	3
Econ.	225 633	Public Finance	3

GEOGRAPHY

Six additional hours of geography courses numbered 400 or above and acceptable to the education adviser.

AMERICAN HISTORY

Required:

Hist.	241 550	American Economic History	3

Six additional hours of American history courses numbered 500 or above and acceptable to the education adviser.

WORLD HISTORY

Nine hours of world history courses numbered 500 or above and acceptable to the education adviser.

POLITICAL SCIENCE

Pol. Sci.	269 333	World Politics	3
Pol. Sci.	269 520	State and Local Government	3
		OR	
Pol. Sci.	269 321	Kansas Politics and Government	3

Three additional hours selected from political science courses numbered 500 or above and acceptable to the education adviser.

SOCIOLOGY

Soc.	277 411	Social Problems	3

Three additional hours of sociology courses numbered 500 or above and acceptable to the education adviser.

SPEECH

Speech	281 106/107	Oral Communication	3
Speech	281 226	Argumentation & Debate	3
Speech	284	Theatre	3
Speech	284 263	Oral Interpretation of Literature	3
		OR	
Speech	284 763	Reader's Theatre	3
Speech	281	Speech Electives	3
Speech	284		

Application For Student Teaching

Each student who plans to enroll in teaching participation in the elementary or secondary school must submit an application for student teaching to the College of Education coordinator of field experiences not later than December 20 of the year preceding the professional semester. This application must be made even though all admission

requirements to the professional semester are not fully satisfied at the time of the application. The application will be obtained from the College of Education adviser and returned to the coordinator of field experiences. Junior and senior transfer students from other educational institutions should file the application immediately upon enrollment.

The Professional Semester

Teaching participation is the culminating clinical experience of the professional semester. The professional semester is comprised of a series of prescribed courses which are accelerated so that one-half of the semester is allocated to the clinical experience (teaching participation). This semester usually occurs in the fall or spring semester 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 in another college or university will be required to audit the equivalent course at Kansas State University.

Admission To The Professional Semester

The coordinator of field experiences will notify applicants of their admission to the professional semester. Students will be approved for the professional semester when the requirements listed below have been met. If the coordinator of field experiences notifies a student that all requirements for the professional semester have not been satisified, the student may request through the College of Education adviser that his application be postponed for one semester. Only one postponement is permitted without filing a new application for student teaching.

A. Requirements for ALL applicants to the Professional Semester:

1. Full admittance to a teacher education program.
2. Completion of 90 semester hours.
3. An overall grade-point average of 2.2 in all course work attempted at KSU.
4. Satisfactory completion of:
   - 405 215 Educational Psychology I
   - 405 315 Educational Psychology II
   - 415 316 Introduction to Instructional Media
5. Recommendation by the College of Education adviser
6. Physical examination by the Student Health Center or by a licensed physician.
   a. Physicals are taken no later than the semester preceding the professional semester.
   b. A copy of the physical examination must be on file in the office of the coordinator of field experiences before a student teaching assignment will be finalized.

B. Additional requirements:

1. Applicants to the SECONDARY PROFESSIONAL SEMESTER:
   A grade-point average of 2.5 in all resident work attempted at KSU in the teaching field is required. Psychology majors must have the 2.5 grade-point average in the required second teaching field.
2. Applicants to the ELEMENTARY PROFESSIONAL SEMESTER:
   Satisfactory completion of the following courses is required
   - 415 470 Science for the Elementary School
   - 415 471 Language Arts for the Elementary School
   - 415 472 Social Studies for the Elementary School
   - 415 473 Mathematics for the Elementary School
   - 415 474 Elementary School Reading

Professional Semester Options

A. CONVENTIONAL PROFESSIONAL SEMESTER. This semester involves eight weeks in the classroom on campus and eight weeks in student teaching. Normally, students will commute from Manhattan to student teaching positions, except in the case of vocational agriculture and vocational home economics and when students choose to live off campus.

The conventional professional semesters are shown below:

ELEMENTARY PROFESSIONAL SEMESTER

415 600	Reading with Practicum	3
405 611	Educational Sociology	3
415 585	Teaching Participation in Elementary School	8
	(Effective December 1978 graduates)	14

SECONDARY PROFESSIONAL SEMESTER

415 586	Teaching Participation in Secondary School	8
415 451	Principles of Secondary Education	3
405 611	Educational Sociology	3
415 476	Methods of Teaching in Secondary School	3
		17

AGRICULTURAL EDUCATION PROFESSIONAL SEMESTER

410 586	Teaching Participation in Secondary School	8
410 621	Program Planning in Vocational Education	3
410 500	Methods of Teaching Agriculture	2
506 599 & 506 553	Courses in Major	6
		19

HOME ECONOMICS EDUCATION PROFESSIONAL SEMESTER

410 586	Teaching Participation in Secondary School	8
410 621	Program Planning in Vocational Education	3
410 550	Methods of Teaching Home Economics	2
415 316	Introduction to Instructional Media	1
		14

MUSIC EDUCATION PROFESSIONAL SEMESTER

415 583	Teaching Participation in Elementary Music	4
415 584	Teaching Participation in Secondary Music	4
415 451	Principles of Secondary Education	3
405 611	Educational Sociology	3
415 316	Introduction to Instructional Media	1
	Courses in Major	2
		17

PHYSICAL EDUCATION PROFESSIONAL SEMESTER (SECONDARY)

415 586	Teaching Participation in Secondary Schools	8
415 451	Principles of Secondary Education	3
405 611	Educational Sociology	3
415 476	Methods of Teaching in Secondary Schools	3
		17

PHYSICAL EDUCATION PROFESSIONAL SEMESTER (ELEMENTARY)

415 585	Teaching Participation in Elementary Schools	8
405 611	Educational Sociology	3
415 469	Physical Education for the Elementary Schools	3
		14

B. The following professional semester options are on the credit/no credit basis only.

The MITEC Option. There are Multi-Institutional Teacher Education Centers located in Topeka and Kansas City. The Kansas City center includes both Kansas City, Kansas, and Shawnee Mission. This is a voluntary, full-semester off-campus option. This professional semester option requires advanced planning with the education adviser or the coordinator of field experiences. Students must make special request for this program.

The CUTE Option. The Cooperative Urban Teacher Education option is in an urban educational setting in Wichita in which the students spend a full semester off campus. Only five or six students are selected by application for this option.

The Competency-Based KSU Teacher Education Option. Selected secondary education majors are involved with a professional semester which focuses on the development of specific teacher competencies, the implementation of those competencies in the classroom where they will student teach, and early participation in those classrooms. The schedule is flexible and a basic objective of the option is to provide alternative ways of developing competencies.

Student Teaching Assignment Request

All options require a special application called "Student Teaching Assignment Request." This form may be obtained from the office of the coordinator of field experiences. This request form should be returned to the office of the coordinator of field experiences by:

September 25 for students participating in the spring professional semester

February 25 for students participating in the fall professional semester

NOTE: Should either of these dates fall on a Saturday, Sunday, or holiday, the next working day will be considered as the due date.

Special Information Concerning The Professional Semester

1. Students enrolled in the professional semester may take no courses which do not conform to the accelerated schedule. This means that during the professional semester no assignments or class attendance may be required during the clinical experience.
2. Students will receive credit or no-credit for teaching participation.
3. Students must be eligible for admission to the professional semester to enroll in any of the professional education courses which are a part of the professional semester.

Graduate Study

The College of Education offers work leading to the Master of Science degree and the Doctor of Philosophy in 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 the catalog.

The College of Education has established numerous off-campus courses throughout the State of Kansas. These courses are offered for those persons who cannot attend classes on campus. Credit toward a graduate degree may be earned through off-campus offerings. Doctoral candidates must meet specific on-campus residency requirements.

Professional Certification and Renewal. Those students who are primarily interested in graduate study to meet certification and/or renewal of teaching skills and do not wish to seek an advanced degree may apply to admission as a special student. Admission in this category is consistent with Graduate School standards for special students. Refer to the section entitled Professional Certification.

Master of Science Degree. Major work leading to the degree Master of Science is offered in the following fields:

agricultural education

home economics education

education—specialization in: adult and continuing education, elementary administration, secondary administration, guidance and counseling, secondary education, elementary education, special education, occupational education

Requirements: Candidates for graduate work shall meet the following admission requirements:

1. Graduation from an accredited institution whose requirements for the bachelor's degree are substantially equivalent to those of Kansas State University.
2. Undergraduate grade average of 3.0 or better in the junior and senior years.
3. Undergraduate preparation substantially equivalent to that given by Kansas State University in the specific subject-matter field in which the applicant expects to do graduate work.
4. Undergraduate preparation in closely related or supporting subjects adequate to support advanced work in the field of the applicant's choice.
5. Undergraduate professional education necessary to satisfy the requirements of the graduate program the student expects to pursue.
6. International students whose native language is not English must make available the results of the Test of English as a Foreign Language (TOEFL).

Students lacking preparation in certain areas may be required to do additional work.

All students expecting to work for a Master's degree 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. Advisers and/or departments may require additional information.

M.S. degree requirements include:

1. A minimum of 30 semester hours, approximately one-half of which shall be in the major field (one option provides for 12 hours).
2. All programs of study must include courses selected from the following list: Philosophy of Education, Curriculum Development, Advanced Educational Psychology, Principles and Practices of Guidance, Basic Principles of Measurement, and Research Methods and Treatment of Data.
3. Academic advisers should be consulted regarding specific departmental course requirements.
4. **Thesis, Report, Non-Report Options:** Departments shall have the option of using one or more of the three plans below:
   a. A thesis of six to eight semester hours
   b. A written report of two semester hours either of research or of problem work on a topic in the major field.
   c. Course work only, but including evidence of scholarly effort such as term papers, production of art, music, designs, etc., as determined by the student's supervisory committee.
5. A final oral examination or a comprehensive written examination or both 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 broad areas of specialization: (1) Administration and Foundations Education, (2) Adult and Occupational Education, and (3) Curriculum and Instruction Education. Joint

programs involving selected departments in other colleges at Kansas State University will prepare individuals for teaching positions in community and four-year colleges.

Requirements: Applicants for admission to the Ph.D. degree program in education shall make available to the office of graduate studies, College of Education two copies of the graduate school application, two official transcripts for undergraduate and graduate courses, verbal and quantitative scores from the aptitude test of the Graduate Record Examination or the Miller Analogies Test score, and a statement of objectives indicating educational experience and professional goals. International students must make available three letters of recommendation. The major professor and/or the departmental faculty may require additional information.

Additional requirements for the Ph.D. degree include a minimum of 90 semester hours of graduate study beyond the bachelor's and these must include:

1. A minimum of 24 hours of course work above the master's degree or equivalent, and 30 hours of research at Kansas State University after admission to the doctoral program.
2. A minimum of 20 hours in the area of specialization, 12 hours in an integrated supporting area, and 9 hours in the prescribed research core. The prescribed research core consists of the following: (a) a first course in statistics, (b) Administration & Foundations (A&F) 817 and (c) A&F 917. A foreign language is not required.
3. For the residency requirement of the doctoral program, 24 hours of course work will be completed on the Kansas State University campus within a calendar year.
4. Written preliminary and oral examinations that meet the requirements of the Graduate School and the College of Education.

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 on the student's interests, expertise, and professional goals.

A member of the graduate faculty in the student's area of study serves as the major professor. The graduate faculty member must agree in conference with the department head to serve as major professor.

Information on special requirements for an advanced degree may be obtained by writing to a department head.

Professional Certification

Initial Certification. The College of Education has the responsibility to serve as the recommending agent for all Kansas State University 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 requirements. Pre-school, elementary and secondary teaching certification may be accomplished through the completion of the approved program and the B.S. or B.A. degrees. Students enrolled in and earning degrees in colleges other than the College of Education must complete all requirements of the teacher education program.

Students may qualify for the three-year degree early childhood certificate, the three-year degree elementary certificate, the three-year degree secondary certificate, or the three-year degree elementary and secondary certificate, as established by the State Board of Education.

Applications for certification are processed by the office of student personnel services of the College of Education, Room 111, Holton Hall.

Persons seeking initial certification who present degrees from other accredited institutions must meet all requirements of the teacher education program.

Recertification. Kansas State University continues to act as the parent institution for persons who have been recommended for initial certification. The renewal requirements as established by the State Board of Education as well as requirements of the College of Education must be satisfied. Community or junior college credit or credit earned through correspondence study may not be used for recertification.

Kansas State University may become the recommending agent for recertification of individuals presenting degrees from other accredited institutions. These persons must complete eight hours in residence, a portion of which must be earned in the College of Education.

Certification requiring work beyond the Bachelor's Degree. The College of Education will recommend for certification individuals satisfying program requirements for the following:

1. **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 at the level they plan to counsel and have two years teaching experience or must satisfy these requirements concurrently with the program.
2. **Speech Clinician.** The speech pathology-audiology program at Kansas State University has been designed to meet the requirements for certification of clinical competence of the American Speech and Hearing Association and the State of Kansas Department of Education requirements for speech clinician. The approved program requires the M.S. degree in the College of Arts and Sciences.
3. **Administrator.** A graduate degree is required for any administrative certificate granted by the State of Kansas. The program as required by the College of Education must be completed. The KSU College of Education may be designated as the parent institution for recommending administrative certification when a student completes a minimum of eight graduate hours at KSU with some work taken in the College of Education. The Department of Administration and Foundations should be contacted regarding advisement for specific administrative certification.
4. **Special Education.** Students at Kansas State University wishing to prepare as special education

teachers may meet all academic requirements for certification as teachers of the gifted, mentally retarded, learning disabled, or those who have personal and social adjustment problems (emotionally disturbed). Each program is considered as being primarily one that leads to a master's degree.

5. **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 12 semester hours in a planned sequence of graduate reading courses is required. (A master's degree is not required for certification.) The College of Education offers a variety of courses which meet these requirements.
6. **Community College Teaching.** A certificate is no longer required to teach in a Community College. The College of Education offers a master's degree which includes those courses recommended for students who desire to prepare for Community College teaching.

Teacher Aide Program

The teacher aide program is designed to give the student early contact with the teaching effort of the public school system. There are both learning and observation situations provided for the student. Providing the aide with this experience hopefully will lead to an earlier and deeper commitment to the teaching profession. Students wishing to participate in the teacher aide program should enroll in 400-100.

Departments & Course Offerings

General Courses in Education

400 100. Pre-Professional Laboratory Experiences. (1) I, II. Supervised experiences in the field of education designed to facilitate orientation and investigation of teaching through the teacher aide program. Maximum credit of three (3) hours. No more than one credit per semester. 400-100-2-0808

400 105. Introduction to Women's Studies. (3)

400 405. Senior Seminar in Women's Studies. (3)

ADMINISTRATION AND FOUNDATIONS

Michael C. Holen, Head of Department*

Professors Danskin,* DeMand,* Hanna,* Hoyt,* McCain,* and Wilson;* Associate Professors Bradley,* Kaiser,* Litz,* Lynch,* Neely,* Newhouse,* Nolting,* Ohlsen,* Parish,* Stewart,* and Van-Meter;* Assistant Professors Dyck,* Goodyear,* Hershey,* McIlvaine,* Sparkman,* Sherrard, Shoop,* and Zabel; Emeritus Professors Baker,* Green,* Moggle,* and Olson.*

The focus of the department is twofold: (1) foundations of education at the undergraduate level in special education and educational psychology and (2) graduate studies in educational administration, guidance counseling, educational psychology, special education, and higher education.

The foundations of education include such topics as community education, educational sociology, plus 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 both the undergraduate and graduate levels.

Studies in special education are intended to 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. Early planning will permit completion of coursework required for provisional certification in special education at the undergraduate level. Permanent certification requires the completion of additional work at the graduate level. Program focus is to work with the mentally retarded, learning disabled and emotionally disturbed student at both the elementary and secondary levels. In addition, a close working relationship is maintained with the Department of Speech in the preparation of supporting personnel in the area of speech pathology and hearing conservation.

Graduate studies in educational psychology and counseling and student personnel prepare teachers, researchers, counselors and guidance personnel for schools, colleges, universities and community settings. Students may choose coursework emphasizing such dimensions as learning and human development, statistics and measurement, guidance and counseling, student personnel work and career development.

The program in the educational administration area is designed to prepare individuals for positions of leadership at all levels of education and in professional organizations and educational agencies. The program provides sufficient breadth and depth to give candidates for advanced degrees ample opportunity to develop essential competencies. A close working relationship is maintained with the Environmental Laboratory, the Center for Community Planning Services, the Computing Center and the College of Architecture and Design in the development of joint programs. Explorations are being made in other areas in which cooperative activities may occur.

Undergraduate Credit

405 111. Group Life Seminar. (1) I. 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. 405-111-1-0801

405 211. Leadership Training Seminar. (2) I. 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. 405-211-1-0801

405 215. Educational Psychology I. (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. Pr.: Psych. 110 and sophomore standing. 405-215-1-0822

405 311. 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.

405 315. Educational Psychology II. (3) I, II, S. The learning process, with special emphasis on abilities and teaching-learning processes, and measurement and evaluation of school learning. Pr.: A&F 215, junior standing, and admission to Teacher Education. 405-315-1-0822

Undergraduate And Graduate Credit In Minor Field

405 511. 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. 405-511-3-0801

405 560. Art for Exceptional Children. (Same as Art 560). 405-560-2-0831

Undergraduate And Graduate Credit

405 611. Educational Sociology. (3) I, II, S. A study to gain an understanding of the ways in which the school can effectively utilize 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. 405-611-0-0801

405 622. 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 A&F 215. 405-622-1-0808

405 628. Characteristics of the Emotionally Disturbed. (3) I. 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.: A&F 622 or A&F 663 and/or consent of instructor. 405-628-1-0816

405 631. Characteristics of Learning Disabilities. (3) 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.: A&F 622 or A&F 663. 405-631-0-0818

405 632. 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.: A&F 315. 405-632-0-0808

405 633. 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.: A&F 631. 405-633-0-0808

405 634. Instructional Materials for Special Education. (3) On sufficient demand. Evaluation and adaptation of instructional materials and media appropriate to the education of the exceptional child. Special materials and media for specific exceptionalities will be considered. 405-634-0-0808

405 663. Education of Exceptional Children. (3) On sufficient demand. A general study of the field 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.: A&F 215 and C&I 300 or 451. 405-663-1-0808

405 664. Mental Retardation. (3) On sufficient demand. Etiological, psychological, sociological, and educational aspects of mental retardation. Pr.: A&F 663. 405-664-0-0808

405 675. 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.: 405 215 or 410 540. (See 410 675 and 415 675) 405-675-3-0801

405 686. 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.: 405 215 or 410 540. (See 410 686 or 415 686) 405-686-3-0801

405 687. Field Experiences in Special Education. (1-3) On sufficient demand. Observation and supervised activities in schools, camps, clinics, or institutions as related to student's area of special interest or preparation. Pr.: A&F 622 or A&F 663. 405-687-2-0808

405 715. 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.: A&F 315. 405-715-1-0825

405 716. 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 405 315. 405-716-1-0824

405 720. Principles and Practices of Guidance. (3) I, S. Need and nature of guidance functions; personnel, their duties and relations; programs and evaluation of results. Pr.: C&I 585 or 586 or consent of instructor. 405-720-1-0826

405 721. 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 A&F 215. 405-721-0-0808

405 726. Junior High School. (2 or 3). I, alternate S. Origin, objectives, program, and administration of the junior high school, and relations with lower and higher education units. Pr.: Teaching experience. 405-726-1-0804

405 752. Educational and Career Development Information. (3) I. 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 the area of career life planning. Pr.: Senior standing and consent of instructor. 405-752-0-0801

405 753. 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.: A&F 663. 405-753-1-0810

405 755. Guidance in the Education 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 pre-school, elementary, secondary, post-secondary, and adult settings. Pr.: A&F 622, A&F 663 and permission of instructor. 405-755-0-0802

405 786. Practicum In Education of Exceptional Children. (3-5) 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. 405-786-2-0808

405 795. 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. 405-795-3-0801

Graduate Credit

405 810. Methodology in Student Personnel Work. (3) S. Study of the methods and procedures to plan, implement, and evaluate a total student personnel program in a higher education setting. Special attention will be given to the environmental, sociological, and psychological influences on the personal and educational development of students. Pr.: A&F 859 and consent of instructor. 405-810-0-0826

405 811. 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. 405-811-0-0826

405 812. History and Philosophy of Higher Education. (3) I. History and development of higher education with a study of the philosophy, objectives and functions of various types of institutions. Pr.: Consent of instructor. 405-812-0-0821

405 813. 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.: A&F 611 or consent of instructor. 405-813-0-0801

405 814. International Education. (3) On sufficient demand. Developing, administering, conducting, and evaluating educational programs from a world perspective. Pr.: Teaching experience or consent of instructor. 405-814-0-0801

405 815. Individual Appraisal. (3) I, S. 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.: A&F 720 and A&F 715. 405-815-1-0825

405 816. 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. 405-816-1-0824

405 817. 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 A&F 715. 405-817-1-0824

405 818. General School Administration. (3) I, 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. 405-818-1-0827

405 819. School Business and Finance. (3) II, alternate S. Professional preparation primarily for school administrators and persons planning to enter that work including problems of finance, administration, and support of schools at local, state, and federal levels. Pr.: At least one year of teaching experience. 405-819-1-0801

405 820. Individual Intelligence Testing. (3-5) II. Theory of the appraisal of individual intelligence with emphasis on techniques of administration, scoring, interpreting and applying in school settings. Supervised practice and developed proficiency in the use of Stanford-Binet and WISC and/or WAIS. Pr.: A&F 715 and consent of instructor. 405-820-1-0825

405 823. Counseling Theory. (3) I, II, S. Theories, methods, and problems in counseling, relating the counseling process to dynamics of human behavior. Pr.: A&F 815 or Psych. 520 or equivalent and conc. enrollment. 405-823-1-0826

405 825. 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.: A&F 611 or A&F 812 or consent of instructor. 405-825-0-0821

405 830. The School Plant. (3) I, alt. S. Determination and provision of building and other plant needs by the local public school district, including planning, financing, construction, and utilization. Pr.: At least one year of teaching experience. 405-830-1-0801

405 831. Public School Law. (1 or 3) II. The nature of legal responsibilities faced by the public school administrator; resources available to him for solution of legal problems. Designed to develop understanding of the legal base upon which public education is built and controlled. Pr.: A&F 818 or consent of instructor. 405-831-1-0827

405 832. The Junior College. (3) I, II, S. This course is designed to give the student an overview of one of the most rapidly growing units in the American educational system. Emphasis on philosophy, purposes, curriculum, organization, professional staff, student-personnel programs, and the role of the comprehensive community junior college in higher education. Pr.: A&F 315 and consent of instructor. 505-832-1-0806

405 833. Administration of Special Education Programs. (2-3) I, II, S. The study of administrative units for special education, placement procedures, federal and state legislation, and program reimbursement and funding. Pr.: 405 818 or 405 811. 405-833-2-0808

405 834. Strategies for Educational Change. (3) I. This course is designed to provide 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.: A&F 818 or 857, or C&I 831. 405-834-0-0801

405 835. The Principalship. (3) I, alt. S. Analysis of the principal's role as he interacts with his various referent groups. Applicable to both elementary and secondary administration. Pr.: One year of teaching experience. 405-835-1-0827

405 836. School-Public Relations. (2 or 3) I. Interrelationships that exist between the school and the community and the role of the teacher and administrator in such relationships. Pr.: A&F 818 for graduate students in educational administration. One year of teaching experience for all others. 405-836-1-0801

405 856. Guidance in the Elementary School. (3) I. 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.: C&I 585, A&F 720 and consent of instructor. 405-856-0-0826

405 857. Organization and Administration of the Guidance Services Program. (2 or 3) II, S. 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. 405-857-0-0826

405 858. Group Guidance. (3) I, S. Designed to acquaint students with group procedures as basic tools in counseling, guidance, and other education services. Pr.: A&F 823 and Psych. 550. 405-858-1-0826

405 859. 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. 405-859-1-0826

405 860. Adult Counseling. (3) I, S. 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.: A&F 823 or concurrent enrollment. 405-860-0-0807

405 861. Organization of Counseling Services for Adults. (3) II. 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.: A&F 860. 405-861-0-0807

405 863. Vocational Psychology. (3) I, S. Environment and human factors in occupational adjustment; appraisal of vocational fitness. Pr.: Consent of instructor. 405-863-0-0839

405 865. Community Education for Post-Secondary Schools. (2-3) II. Analysis of community education trends, techniques and evaluations as they relate to and are implemented into the post-secondary educational environment. Pr.: A&F 611. 405-865-0-0807

405 885. 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 post-secondary, college, or university setting. Pr.: A&F 859 and consent of instructor. 405-885-2-0826

405 886. Guidance Services Practicum. (3) I, II, S. Supervised experience in guidance services in secondary schools; preparation and use of pupil personal records, tests, provision and use of occupational and educational information, counseling, placement and follow-up, and use of school and community personnel and resources. Pr. or conc.: A&F 823 and consent of instructor. 405-886-2-0826

405 887. Practicum in Counseling. (3) I, II. Supervised practical experience in counseling. Pr.: A&F 823 and consent of instructor. (Same as Psych. 860). 405-887-2-0826

405 888. Seminar in Student Personnel Work. (1-4) On sufficient demand. Credit arranged. 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. 405-888-0-0826

405 889. Practicum in School Administration. (3-6) I, II, S. Supervised on-the-job experience in school administration. Pr.: Kansas School Administrator's Certificate or consent of instructor. 405-889-2-0827

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.

405 890. Educational Administration. 405-890-0-0827

405 891. Social Foundations. 405-890-0-0821

405 892. Guidance Services. 405-890-0-0826

405 893. Special Education. 405-890-0-0808

405 894. Community Education. 405-890-0-0807

405 898. Master's Report. (Var.) I, II, S. Pr.: Consent of instructor. 405-898-3-0801

405 899. Master's Research. (Var.) I, II, S. Pr.: Consent of instructor. 405-899-4-0827

405 910. Educational Personnel Administration. (3) II. Personnel practices in education are considered along with the implications of collective negotiations and professional accountability for personnel policies. Pr.: A&F 818. 405-910-0-0805

405 915. Theory of Measurement. (3) I. 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.: A&F 715. 405-915-1-0825

405 917. Experimental Design in Educational Research. (3) I, 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.: A&F 817. 405-917-1-0824

405 920. Advanced Educational Psychology: Learning. (3) I, S. 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.: A&F 315 or its equivalent. 405-920-1-0822

405 921. Advanced Educational Psychology: Development. (3) II. Advanced studies in physical, intellectual, emotional, social and personality development with the focus on the importance of these factors to the educational process. Pr.: A&F 315. 405-921-1-0822

405 924. Systems and Theories of Vocational Counseling. (3) II. A historical and contemporary analysis of systems and theories of vocational psychology and their implications for use in the counseling setting. Pr.: A&F 752 and A&F 823. 405-924-0-0839

405 925. Educational Systems Analysis. (3) I. A study of systems analysis techniques applicable to education including PERT, CPM and PPBS. Intended for administrators, business managers and educational researchers. Pr.: A&F 818 or consent of instructor. 405-925-0-0827

405 926. 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.: A&F 818. 405-926-0-0827

405 927. Higher Education Administration. (3) On sufficient demand. 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.: A&F 812. 405-927-1-0827

405 928. Educational Governance. (3) II. 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.: A&F 818 and six additional hours in Educational Administration. 405-928-0-0801

405 933. Educational Personnel Administration. (3) II. Personnel practices in education are considered along with the implications of collective negotiations and professional accountability for personnel policies. Pr.: A&F 818. 405-933-1-0827

405 986. Advanced Counseling Theory and Practice. (3-6) I, II. Designed to help the student integrate advanced theory, research and practice in counseling and student personnel work. Pr.: Knowledge of personality theory, theories of learning and motivation, A&F 823 and consent of instructor. 450-986-2-0826

405 987. 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. 405-987-2-0826

405 988. Internship in Education—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 six credit hours may be chosen. Pr.: Consent of instructor. 405-988-2-0808

Internship in A&F. (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 six credit hours may be chosen from the areas listed. Pr.: Consent of instructor.

405 989. Educational Administration and Foundations. 405-989-2-0827

405 990. Student Personnel Services. 405-990-2-0826

Advanced Seminars in A&F. (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.

405 991. Educational Administration. 405-991-3-0827

405 992. Educational Psychology. 405-992-3-0822

405 993. Student Personnel. 405-993-3-0826

405 994. Special Education. 405-994-2-0808

405 999. 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. 405-999-4-0801

ADULT AND OCCUPATIONAL EDUCATION

Ralph G. Field, Head of Department*

Professors Apel,* Johnson,* Meisner,* Parsons,* Prawl,* Scott,* and Terrass;* Associate Professors Albracht,* Carpenter,* Griffith, Hausmann, Oaklief,* and Welton;* Assistant Professors Eaves, Green,* Jorns, Simmons, Stanius, Vallance, Vicker, and Wiebe; Instructors Broeckelman, Crook, Soldan, and Wissman. Emeritus: Professor Bradley;* Associate Professor Hall.*

The undergraduate and graduate programs in the adult and occupational area are designed for selected individuals seeking to prepare themselves for roles as professional educators in public and private institutions and agencies.

Undergraduate teacher education programs are designed to prepare prospective teachers for teaching and allied positions in adult education, vocational education in agriculture and home economics, business education, career education and related fields of adult, occupational and continuing education.

The adult education undergraduate curriculum described on page 210, is a relatively new program designed to accommodate those embarking on a career in adult and continuing education. Students completing the curriculum are awarded the B.S. in education with a major in adult education.

The agricultural education undergraduate curriculum, described on page 55, is offered in cooperation with the College of Agriculture. Students completing the curriculum requirements are awarded a B.S. in agriculture and may be certified to teach vocational agriculture in Kansas.

The business education undergraduate curriculum, offered in cooperation with the College of Business Administration, is described on page 212 under secondary education major field. Students completing the curriculum requirements are awarded a B.S. in secondary education and may be certified to teach business education in Kansas secondary schools.

The home economics education undergraduate curriculum, offered in cooperation with the College of Home Economics, is described on page 273. Students completing the curriculum requirements are awarded a B.S. in home economics and may be certified to teach vocational home economics in Kansas.

To provide opportunities for professional development and/or meeting state certification requirements for persons already employed in public and private adult, occupational and continuing education programs, inservice courses are offered at both the undergraduate and graduate levels.

Graduate programs supervised by the adult, occupational and continuing education faculty include the Master of Science degree in agricultural education, home economics education, and adult and occupational education, and the Doctor of Philosophy degree in education offered in the comprehensive areas of adult and continuing education and occupational education.

The adult and occupational education M.S. speciality offers specializations in adult and continuing education and/or occupational education as well as supporting courses in adult basic education, career education, extension education, industrial training and supervision, and vocational-technical administration.

Graduates receiving the Doctor of Philosophy degree are prepared to enter administration, supervision, teaching, program development and community service areas. Examples of agencies and organizations employing adult, continuing education and/or occupational education graduates are continuing education, cooperative extension services, community and junior college technical schools, public and private higher education rehabilitation agencies, employment security, religious institutions, proprietary schools. Refer to graduate study section, page 220, for College of Education general requirements.

Courses in Adult and Occupational Education

Undergraduate Credit

410 319. Agricultural Education Colloquium. (Var.) On sufficient demand. Discussion, assigned readings, and lectures over the selected trends, developments, and problems which are peculiar to the overall field of 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. 410-319-0-0899

Undergraduate And Graduate Credit In Minor Field

410 500. 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.: A&F 315. 410-500-0-0899

410 501. Independent Study in Education. (1-3). Selected topics in professional education. Maximum of three hours applicable toward degree requirements. Pr.: Consent of department head. 410-501-3-0899

410 540. Contemporary Practice of Adult Education. (3) I, S. Consideration of those andragogical processes critical to the professional practice of adult education in specific areas of application. Pr.: 410-540-0-0807

410 550. Methods of Teaching Home Economics. (2) I, II. Selection of techniques: organization, preparation, and presentation of materials for teaching secondary programs. One hour rec. and two hours lab. a week. Pr.: Junior standing; A&O 621 or conc. enrollment; taken semester prior to A&O 586. 410-550-0-0899

410 560. Methods of Teaching for Dietetic Students. (3) I. Principles of teaching applied to selection, organization, and development of subject matter for individuals and courses taught by dietitians. Pr.: Senior standing in Institutional Management and Dietetics. 410-560-0-0839

410 586. Teaching Participation in the Secondary School. (Var.) I, II. Observation and teaching participation under direction of selected teachers in junior and senior high schools. Pr.: Admission to Student Teaching. (See C&I 586.) 410-586-2-0803

Undergraduate And Graduate Credit

410 605. 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. 410-605-0-0807

410 610. Occupational Home Economics Education. (3) I, 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.: A&F 215 or conc. enrollment. 410-610-0-0899

410 620. 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.: A&F 315. 410-620-0-0839

410 621. Program Planning in Vocational Education. (3) I, II, S. The program development and planning process; development of guides for teaching and evaluating reimbursable secondary programs. Pr.: A&O 620. 410-621-0-0839

410 625. 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.: 410-625-0-0807

Practica 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.

410 632. Career Education. 410-632-2-0807

410 633. Adult Education. 410-633-2-0807

410 634. Agriculture Related Occupations. 410-634-2-0899

410 635. Business and Office Occupations. 410-635-2-0807

410 636. Extension Education. 410-636-2-0807

410 637. Home Economics Related Occupations. 410-637-2-0899

410 638. Industrial Occupations. 410-638-2-0839

410 639. Coordination of Cooperative Vocational Education. (3) I, II, S. Emphasis on the legal aspects and other minimum requirements essential to conducting cooperative vocational education programs at the secondary and post-secondary levels. Pr. or conc.: A&O 620. 410-639-0-0839

410 675. 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.: 405 215 or 410 540. No more than six hours may apply to a graduate degree (See A&F 675 and C&I 675).

410 680. 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. 410-680-0-0807

410 686. 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.: 405 215 or 410 540. No more than six hours may apply to a graduate course (See A&F 686 and C&I 686).

410 701. Administration and Supervision of Vocational Education. (2-3) Offered on sufficient demand. I, S. 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. 410-701-0-0839

410 703. Teaching Adult Classes in Agriculture. (2 or 3) Offered 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.: A&O 620. 410-703-0-0899

410 705. Organization Problems in Teaching Farm Mechanics. (2) Offered on sufficient demand. Analysis of the farm mechanics course of study; needs and interests of boys; learning difficulties; skills and technical knowledge required; correlation with agriculture; application of laws of learning to the teaching process; determination of objectives. Pr.: A&O 586. 410-705-0-0839

410 707. 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 problem-solving approaches and change-implementing programs. 410-707-0-0807

410 713. Occupational Analysis. (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.: A&O 620. 410-713-0-0807

410 750. Practical Arts Education. (3) I, S. Emphasis on designing unified practical arts programs for exploration; occupational clusters; and curricular innovation relevant to career education. Pr.: Teaching experience. 410-750-0-0807

410 752. 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. 410-752-0-0807

410 753. Introduction to Occupationai 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. 410-753-0-0807

410 754. Adult Basic Education. (3) I, II, S. 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. 410-754-0-0807

410 788. 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. Designed to serve undergraduate as well as graduate needs. Pr.: Consent of instructor. 410-788-0-0899

410 791. Career Education. (2-4) I, II, S. Emphasis on providing for prevocational experiences including orientation and exploratory and applied experiences in school and nonschool situations. Pr.: Teaching experience or consent of instuctor. 410-791-0-0839

410 792. Hospitai 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. Pr.: Consent of instructor. 410-792-0-0839

410 795. Problems in Adult and Occupational Education. (Var.) I, II, S. Independent study of specific problems in the areas of adult or occupational education. Pr.: Consent of instructor. 410-795-3-0807

Graduate Credit

410 805. Field Experience in Agriculturai Education. (2 or 3) On sufficient demand. A course designed for prospective teachers to help bridge the gap between classroom theory and student teaching. Emphasis will be placed on observation of and participation in school and community organizations and programs. Pr.: A&O 620 and consent of instructor. 410-805-0-0899

410 811. Consumer Education. (2 or 3) S. Evaluate syllabi and approaches to teaching consumer education. Relate consumer education to consumer economics and consumer affairs. Pr.: A&O 550 or A&O 752 and F. Ec. 400 or consent of instructor. (See F. Ec. 811). 410-811-0-0807

410 820. 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. 410-820-0-0807

410 822. Young Farmer and Adult Farmer Education in Agriculture. (2 or 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. 410-822-0-0899

410 823. Agricuiturai Education for Beginning Teachers. (1-3) S. Securing and organizing information and planning teaching activities which will help the beginning vocational agriculture teacher. Pr.: Graduation from the Curriculum in Agricultural Education. 410-823-0-0899

410 825. 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.: 410-605 or 410-825-0-0807

410 830. 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. 410-830-0-0807

410 834. 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.: A&O 621 and teaching experience. 410-834-0-0899

410 840. Curriculum in Agriculture I. (2 or 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. 410-840-0-0899

410 842. Curriculum in Agriculture II. (2 or 3) S. Cont. of A&O 840. Pr.: A&O 840 or consent of instructor. 410-842-0-0899

410 845. Field Studies in Agricultural Education. (2 or 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. 410-845-0-0899

410 854. Advanced Occupational Home Economics Education. (2-3) I, II, S. Development of home economics related occupational programs with emphasis on curriculum, evaluation and techniques used in cooperative programs. Pr.: A&O 610 and teaching experience. 410-854-0-0899

410 860. 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.: A&O 680. 410-860-0-0807

Seminars in Education. Credit arranged. 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.

410 890. Home Economics Education. 410-890-0-0899

410 891. Agricultural Education. 410-891-0-0899

410 892. Adult Education. 410-892-0-0807

410 899. Master's Research. (Var.) I, II, S. Pr.: Consent of instructor. 410-899-3-0839

410 910. 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. 410-910-0-0807

410 914. 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. 410-914-0-0839

410 916. 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. 410-916-0-0807

410 929. 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. 410-929-0-0839

410 930. Manpower Surveys. (3) II, S. A critical study of methods and procedures involved in planning, organizing, conducting, and analyzing community and regional manpower surveys. Application to particular fields of occupational education will be stressed. Pr.: Graduate standing. 410-930-0-0839

410 937. 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. 410-937-0-0807

410 940. 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.: A&O 701 or consent of instructor. 410-940-0-0807

410 952. Internship in Adult & 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 six credit hours. Pr.: Consent of instructor. 410-952-2-0807

410 962. Advanced Seminars in Adult & 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. 410-962-0-0807

410 999. 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. 410-999-4-0807

CURRICULUM AND INSTRUCTION

Norbert W. Maertens, Head of Department*

Professors Boyer,* Dixon,* Hause,* Horn,* James,* Keys,* Kurtz,* Littrell,* Maertens,* Owens,* Price,* Schell,* Teague,* and Utsey,* Associate Professors Bailey,* Bartel,* McAnarney,* Trennepohl,* and Wauthier;* Assistant Professors Alexander,* Byars,* Caine,* Calvano,* DeChenne, Dotts,* M. Harris,* Heerman,* Hewitt, Jones, Loeb,* W. Martin, Perl, Phillips, Readence,* Romero, Rosenblatt, Treadway, and Welmer;* Instructors B. Newhouse and Kater; Assistant Instructor Goodenow. Emeritus: Professors Craig and Smethers.

Undergraduate Credit

415 050. Developmental Reading Laboratory. (3) I, II. Designed to improve the college student's reading skills, rates of comprehension, vocabulary, and study skills. Pr.: Consent of instructor. 415-050-1-0801

415 051. Study Skills Laboratory. (1-3) I, II, S. Designed to help the student to learn effective study methods, analyze difficulties in reading and studying, how to prepare for and improve performance in examinations. 415-051-0-0829

415 300. Principles of Elementary Education. (3) I, II. An over-all view of the elementary school: organization, management, purpose, curriculum trends, and pupil characteristics. Pr.: Junior standing. 415-300-0-0802

415 316. Introduction to Instructional Media. (1) I, II, S. Experiences in the choice, production, evaluation, and utilization of instructional materials. Operation and simple maintenance of basic types of instructional equipment. Pr.: Admission to teacher education or consent of instructor. 415-316-1-0801

415 317. Instructional Media for Elementary Children. (3) I, II, S. Methods of planning and evaluating experiences to help children gain skills for interpreting life experiences through book and nonbook media. Pr.: A&F 215 or consent of instructor. 415-317-0-0802

415 325. Safety. (3) I, II, S. Fundamentals of accident analysis and prevention, maintenance, human factors, safety standards, treatment of special hazards. Three hours rec. a week. Pr.: Junior standing. 415-325-1-0836

415 326. Problem in Safety Education. (1) Pr.: Consent of instructor. 415-326-3-0836

415 328. Driver and Traffic Safety Education I. (3) I, S. Critical analysis of traffic accidents, attitude factors, essential knowledge of automobile operation, traffic laws and regulations. Includes laboratory experience in the use of psychophysical testing and in the teaching of driving skills. Two hours rec. and three hours lab. a week. Pr.: Psych. 110, A&F 215, C&I 325, a valid driver's license, and good driving record. 415-328-1-0836

415 330. Driver and Traffic Safety Education II. (3) II, S. This course deals with professional preparation for secondary school instruction in this field. Primary areas of study include classroom and in-car teaching techniques. A study of organization and administration of driver education: emphasis on competence in transforming knowledge and skills, as well as inspiring satisfactory attitude in students. Two hours rec. and three hours lab. a week. Pr.: C&I 328, 21 years of age, and senior standing. 415-330-1-0836

415 331. Problem in Driver Education. (1) Pr.: Consent of instructor. 415-331-1-0836

415 415. Art for Exceptional Children. (3) I, II. A study of the knowledge and methods of utilizing art concepts and art activities by the elementary teacher to develop and enhance the learning experiences of exceptional children, including the disadvantaged, physically handicapped, mentally retarded and emotionally disturbed. Six hours lab. Pr: Elementary education or art major and Psych. 110. Same as Art 415. 415-415-1-0831

415 451. Principles of Secondary Education. (3) I, II, S. Junior and senior high school organization and objectives, their genesis and curriculum trends, characteristics of student population, and legal status and practices. Pr.: A&F 315. 415-451-0-0803

415 469. Physical Education in Elementary Schools. (3) I, II, S. Methods of teaching and organization of materials in a progression for an elementary physical education program. Pr.: admission to teacher education, and 261 206, and at least two courses from the elementary physical education specialization. 415-469-0-0802

415 470. Science for Elementary Schools. (3) I, II, S. The relationships among nature, environment and elementary science in their role in childhood education resources and activities suitable to the elementary school. Pr.: Admission to Teacher Education or consent of instructor. 415-470-1-0834

415 471. Language Arts for Elementary Schools. (3) I, II, S. Modern trends in the teaching of reading, oral language, composition, and spelling. Pr.: Admission to Teacher Education or consent of instructor. 415-471-1-0802

415 472. Social Studies for Elementary Schools. (3) I, II, S. 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 or consent of instructor. 415-472-1-0802

415 473. Mathematics for Elementary Schools. (3) I, II, S. 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 or consent of instructor. 415-473-1-0833

415 474. Elementary School Reading. (3) I, II, S. An introductory course in the content, methods, and materials of the total reading program in the elementary school. Pr.: Admission to Teacher Education or consent of instructor. 415-474-1-0830

415 475. Elementary School Reading Lab. (1) I, II, S. Application of topics selected from and correlated with Elementary School Reading. Pr.: C&I 474 or concurrent enrollment. 415-475-1-0830

415 476. Methods of Teaching in the Secondary School. (2 or 3) I, II. General principles of teaching applied to secondary school instruction; motivation, organization of subject matter; lesson planning; evaluation and reporting; challenging the levels of ability; organization and management of the classroom; attention given to both methodology and materials of the secondary schools. Pr.: Admission to Student Teaching. 415-476-1-0803

Undergraduate And Graduate Credit In Minor Field

415 502. 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. 415-502-3-0801

415 530. Education and the Black American. (3) II, S. An examination of curriculum implementation in light of race relations and economic-educational development. Modules related to the role of the Black American in education as seen from a Black perspective will be employed. (Interracial school studies) Pr.: Junior or senior standing or consent of instructor. 415-530-0-0801

415 583. Teaching Participation in Elementary Music. (4) I, II. Observation in teaching under the direction of selected teachers in elementary music school programs. Pr.: Music 412 and admission to Student Teaching. 415-583-2-0832

415 584. Teaching Participation in Secondary Music. (4) I, II. Observation in teaching under the direction of selected music teachers in junior and senior high schools. Pr.: Music 413 and admission to Student Teaching. 415-584-2-0832

415 585. Teaching Participation in the Elementary School. (Var.) I, II. Observation and teaching participation under the direction of selected elementary teachers. Pr.: C&I 300, 470, 471, 472, 473 and admission to Student Teaching. 415-585-2-0802

415 586. Teaching Participation in the Secondary School. (Var.) I, II. Observation and teaching participation under direction of selected teachers in junior and senior high schools. Pr.: Admission to Student Teaching. (See A&O 586). 415-586-2-0803

Undergraduate And Graduate Credit

415 614. 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.: Junior or senior standing and consent of instructor. 415-614-1-0834

415 617. Corrective Reading Instruction. (1-3) I, II, S. Supervised tutoring of children with reading difficulties. Not open to students with credit in C&I 847. Pr.: Student teaching experience or consent of instructor. 415-617-2-0817

415 630. Curriculum Materials for Ethnic Diversity. (3) I, II, S. An examination and analysis of recent materials and practices of schools serving multi-ethnic student bodies, particularly minorities from disadvantaged backgrounds. Materials include any items utilized by the school in implementing the curriculum. Pr.: Senior standing or higher. 415-630-2-0801

415 640. Motorcycle Safety Education. (2) II, S. Curriculum development, teaching practices, and administration of motorcycle safety education. Laboratory activities: teaching learners in classroom, on range and street. Pr.: C&I 330. 415-640-1-0801

415 645. Driving Ranges and Simulators. (2) I, S. Principles and practices of teaching on multiple-car driving ranges and with driving simulators; administration of multi-phase programs in driver and traffic safety education. Two hours lab. a week. Pr.: C&I 330. 415-645-1-0801

415 662. Instructional Television. (3) On sufficient demand. The principles of instructional television: its development, programming, techniques and application. Pr: Junior standing. 415-662-1-0801

415 675. 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.: 405 215 or 410 540 (See 405 675 and 410 675). 415-675-3-0829

415 686. 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.: 405 215 or 410 540 (See 405 686 and 410 686). 415-686-0-0829

415 704. Extra-Class Activities. (3) II, S. Organization, sponsorship, and objectives of clubs, publications, athletics, dramatics, musical organizations, assemblies, home room, and student council in junior and senior high schools. Pr.: C&I 450, senior standing, or consent of instructor. 415-704-0-0803

415 706. 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.: C&I 475, C&I 586 or teaching experience. 415-706-1-0801

415 715. Reading in the Secondary School Subjects. On sufficient demand. Information concerning the reading process. Techniques for helping students develop reading and study skills needed for studying materials used in the secondary school subjects. Course is designed for classroom teachers. Pr.: Senior standing and consent of instructor. 415-715-0-0830

415 719. 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.: Consent of instructor. 415-719-0-0801

415 730. Education of the Disadvantaged. (3) On sufficient demand. Consideration of the life-space of the disadvantaged learner and its relationship to curriculum, organization and inter-personal relationships in schools. The development of realistic, relevant goals for the teacher of the disadvantaged. Pr.: A&F 611 or consent of instructor. 415-730-0-0813

415 735. Improving Elementary Science Teaching. (3) I, II. 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 and/or consent of instructor. 415-735-1-0834

415 737. 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 and consent of instructor. 415-737-0-0801

415 739. Environmental Education. (1-3) I, II, S. 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.: A&F 302, a course in environmental studies and/or consent of instructor. 415-739-0-0801

415 756. Instructional Communication Processes. (3) I, S. Processing of information via the auditory and visual perceptual systems and implications for the design and utilization of instructional technology. Pr.: Consent of instructor. 415-756-0-0801

415 760. Audio-Visual Instruction. (2 or 3) I, II, S. Principles and techniques in the use of visual and audio-visual materials; operation and maintenance of equipment and sources of supply. Pr.: Completion of student teaching or graduate standing. 415-760-1-0801

415 765. Planning and Developing Instructional Materials. (3) On sufficient demand. 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.: C&I 760 or consent of instructor. 415-765-1-0801

415 779. Primary School Education. (3) I, II. 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.: A&F 315 and/or consent of instructor. 415-779-0-0823

415 780. Kindergarten Education. (3) S. 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.: A&F 215, C&I 300 and junior standing. 415-780-0-0823

415 795. Problems in Curriculum and Instruction. (Var.) I, II, S. Independent study of a specific problem in curriculum or instruction. Pr.: Consent of instructor. 415-795-3-0823

Graduate Credit

415 803. 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. 415-803-0-0829

415 804. Curriculum Construction for Secondary Schools. (2 or 3) On sufficient demand. Procedures for organizing and conducting programs for curriculum improvement in the secondary schools; techniques for the development and evaluation of curriculum materials. Opportunity is provided for work on individual curriculum problems. Pr.: C&I 803 and teaching experience. 415-804-0-0829

415 808. Curriculum in the Inner City. (3) I, II. Exploration of research and innovations in curriculum and instruction for inner city schools. Emphasis placed on curricular and instructional difficulties in low-income communities and on productive compensatory educational practices. Pr.: C&I 803 and/or consent of instructor. 415-808-0-0801

415 811. Curriculum Construction for Elementary Schools. (2 or 3) On sufficient demand. Procedures for organizing and conducting programs for curriculum improvement in the elementary schools; techniques for the development and evaluation of curriculum materials. Opportunity is provided for work on individual curricular problems. Pr.: C&I 803 and teaching experience. 415-811-0-0829

415 820. 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 or consent of instructor. 415-820-0-0802

415 821. 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 or consent of instructor. 415-821-0-0833

415 822. 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 or consent of instructor. 415-822-0-0802

415 831. Supervision and Improvement of Instruction. (3) S. A course designed for administrators, supervisors, and classroom teachers who wish to help themselves and others isolate and analyze teaching problems. Pr.: One year of teaching experience. 415-831-0-0801

415 832. 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 non-graded, multi-graded, and multi-tracked programs. Pr.: Teaching experience or consent of instructor. 415-832-0-0801

415 833. 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 or consent of instructor. 415-833-0-0801

415 835. Supervision of Student Teaching. (3) On sufficient demand. Organization and functions of student teaching programs; orienting, supervising, and evaluating student teachers in elementary and secondary schools. Pr.: Teaching experience and consent of instructor. 415-835-0-0801

415 842. Directed Professional Development. (5) I, II. 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 and consent of instructor. 415-842-0-0803

415 843. Principles of College Teaching. (3) I, II. Overview of principles of learning, learning theory, educational objectives, methods and techniques, college students and evaluation in the classroom. Emphasis upon pre-service and in-service help in improving instruction at the college level. Pr.: Consent of instructor. 415-843-0-0805

415 844. Current Issues in College Teaching. (2) II. Attention given to 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.: C&I 843 and consent of instructor. 415-844-0-0805

415 845. 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.: C&I 474 or consent of instructor. 415-845-1-0830

415 846. Diagnosis and Treatment of Reading Disabilities. (3 or 4) I, S. 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.: C&I 715 or 847 and teaching experience or consent of instructor. 415-846-3-0817

415 847. Clinical Practices in Reading. (3) II, S. Supervised experience in diagnosing and teaching children with reading problems. Pr.: C&I 846. 415-847-1-0817

415 848. Organization and Administration of Reading Programs. (2) II, S. 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.: C&I 715 or 845 or consent of instructor. 415-848-0-0817

415 860. 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.: C&I 760 or consent of instructor. 415-860-0-0801

415 864. Programmed Instructional Materials. (3) On sufficient demand. Design, testing and instructional applications of programmed instructional materials, teaching machines and automated systems of instruction with emphasis on multi-media formats. Pr.: C&I 760 and A&F 920 or consent of instructor. 415-864-1-0829

415 866. 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.: C&I 760 or consent of instructor. 415-866-1-0829

415 872. 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.: C&I 845, C&I 715 or consent of instructor. 415-872-0-0830

415 873. 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.: C&I 803 and consent of instructor. 415-873-0-0834

415 874. 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.: C&I 803, experience teaching mathematics, and consent of instructor. 415-874-0-0833

415 875. The English 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.: C&I 803 and consent of instructor. 415-875-0-0801

415 876. 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.: C&I 803 and/or consent of instructor. 415-876-0-0803

415 877. 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.: C&I 803 and consent of instructor. 415-877-0-0829

415 879. Junior College Curriculum. (3) I, II, S. Evaluation of 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.: A&F 832 and/or consent of instructor. 415-879-0-0806

415 884. Computer Applications in Education. (3) On sufficient demand. The effects of information retrieval systems, data processing, and computer assisted instruction on the curriculum, instruction, and administration of educational institutions. Pr.: Educational experience and consent of instructor. 415-884-1-0801

415 886. Seminars in Curriculum & 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.: Consent of instructor. 415-886-0-0829

415 898. Master's Report. (Var.) I, II, S. Pr.: Consent of instructor. 415-898-3-0829

415 899. Master's Research. (Var.) I, II, S. Pr.: Consent of instructor. 415-899-3-0829

415 907. Curriculum Theory. (3) On sufficient demand. Theoretical concepts underlying significant curriculum developments. A systematic critique of current curricular theory. Consideration of model generation. Pr.: C&I 804 or 811 and consent of instructor. 415-907-0-0829

415 908. 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.: C&I 831, A&F 920, and consent of instructor. 415-908-0-0829

415 920. The Analysis and Evaluation of Curriculum and Instruction. (3) On sufficient demand. Data matrices, formative and summative evaluation, and other models as bases for decision making about educational programs. Consideration of criterion problems in instructional evaluation. Pr.: C&I 803, A&F 816 and/or consent of instructor. 415-920-0-0829

415 990. Internship in College Teaching. (2-6) On sufficient demand. 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, C&I 844, and consent of department head. 415-990-2-0805

415 991. Internship in Curriculum & Instruction. (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 six credit hours may be chosen from the areas listed. Pr.: Consent of instructor. 415-991-2-0829

415 999. Research in Curriculum and Instruction. (Var.) I, II, S. Pr.: A&F 817 and/or consent of instructor. 415-999-4-0829



College of Engineering

Donald E. Rathbone, Dean
Teddy O. Hodges, Associate Dean
John P. Dollar, Assistant Dean
Ray E. Hightower, Assistant to the Dean

A course of study leading to a degree in the College of Engineering provides a well-rounded university education designed to develop the general qualities of leadership and human understanding inherent in an educated person.

In addition it equips the student with a broad theoretical and practical background to meet the new and demanding problems of our technological society. To assure the continued economic and technologic development of this nation, an increasing number of high school students should select careers in this challenging profession.

In the College of Engineering at KSU, an outstanding faculty and excellent physical facilities provide a stimulating environment for the student.

The College of Engineering offers the Bachelor of Science degree in each of the following fields:

Agricultural Engineering—curriculum on page 235
Architectural Engineering—curriculum on page 235
Chemical Engineering—curriculum on page 236
Civil Engineering—curriculum on page 237
Construction Science—curriculum on page 236
Electrical Engineering—curriculum on page 237
Industrial Engineering—curriculum on page 238
Mechanical Engineering—curriculum on page 239
Nuclear Engineering—curriculum on page 239
Engineering Technology—curriculum on page 240

A general description of each of these curricula, including a list of the faculty and departmental course offerings, is presented on pages 244 through 268. Also included in this section is a summary of the graduate program of each department. The Master of Science degree is offered in each of the preceding areas except architectural engineering, engineering technology and construction science.

To provide the engineering graduate student with maximum access to all of its resources (faculty, laboratories, etc.), the College of Engineering offers the Ph.D. degree in engineering. The student can now study in one of the traditional areas or develop a program of study to fit particular interests and needs.

CLASSICAL DEPARTMENTS
Agricultural Engineering
Chemical Engineering
Civil Engineering
Electrical Engineering
Industrial Engineering
Mechanical Engineering
Nuclear Engineering

TYPICAL INTERDISCIPLINARY AREAS
Systems Engineering
Materials Science
Energy Processes
Bioenvironmental Engineering
Information Processing

Additional information on the graduate program is included in the section on the Graduate School, page 33.

Undesignated Major

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		Course	Sem. Hrs.
English	229 100	English Composition I	3
Chemistry	221 210	Chemistry I	4
Mathematics	245 220	Anal. Geometry & Calculus I	4
Gen. Engg.	500 160	Engineering Concepts	2
		Hum. or Soc. Sci. Elec.	3
Physical Education	261 101	Concepts in Phys. Ed.	1
Gen. Engg.	500 010	Engineering Lectures	0
			17

Spring Semester		Course	Sem. Hrs.
English	229 120	English Composition II	3
Chemistry	221 230	Chemistry II	4
Mathematics	245 221	Anal. Geometry & Calculus II	4
Economics	225 110	Economics I	3
		Hum. or Soc. Sci. Elec.	3
Gen. Engg.	500 010	Engineering Lectures	0
			17

CURRICULUM IN AGRICULTURAL ENGINEERING

B.S. in Agricultural Engineering

FRESHMAN

Fall Semester		Course	Sem. Hrs.
English	229 100	English Composition I	3
Chemistry	221 210	Chemistry I	4
Mathematics	245 220	Anal. Geometry & Calculus I	4
Ag. Engg.	505 160	Ag Engg Concepts	2
		Humanities or Soc. Sci. Elec.*	3
Phys. Ed.	261 101	Concepts in Phys. Ed.	1
			17
Spring Semester			
English	229 120	English Composition II	3
Chemistry	221 230	Chemistry II	4
Mathematics	245 221	Anal. Geometry & Calculus II	4
Economics	225 110	Economics I	3
		Hum. or Soc. Sci. Elec.*	3
			17

SOPHOMORE

Fall Semester			
Mathematics	245 222	Anal. Geometry & Calc. III	4
Physics	265 213	Engg Physics I	5
Biology	215 19B	Principles of Biology	4
Mech. Engg.	560 212	Graph Comm., Anal. & Des. I	2
Speech	281 105	Oral Communication I	2
			17
Spring Semester			
Mathematics	245 240	Series & Diff. Equations	4
Physics	265 214	Engg Physics II	5
Ag. Engg.	505 312	Biol. Matls. & Machine Function	3
Ind. Engg.	550 372	Comp. and Data Processing	2
Civil Engg.	525 333	Statics	3
			17

JUNIOR

Fall Semester			
Ag Engg	505 510	Env. Des. of Farm Bldgs.	3
Mech. Engg.	560 513	Thermodynamics I	3
Mech. Engg.	560 512	Dynamics	3
Civil Engg.	525 533	Mech. of Materials	3
Civil Engg.	525 534	Mech. of Materials Lab.	1
		Hum. or Soc. Sci. Elec.*	3
			16
Spring Semester			
Ag. Engg.	505 566	Anal. Ag. Structures	3
Ag. Engg.	505 520	Energy Use & Control in Ag Systems I	3
Ag Engg	505 551	Hydrology	2
Mech. Engg.	560 571	Fluid Mechanics	3
Elec. Engg.	530 510	Circuit Theory I	3
or			
Elec. Engg	530 519	Electric Circuits & Controls	4
Civil Engg.	525 522	Soil Mechanics I	3
or			
Agron.	015 745	Phys. Env. of Crops & Soils	3
			17/18

SENIOR

Fall Semester			
Ag Engg	505 530	Soil and Water Engg.	3
Ag. Engg.	505 536	Design of Ag. Machines	3
		Hum. or Soc. Sci. Elec.*	3
		Technical Electives**	6
			15
Spring Semester			
Ag. Engg.	505 570	Energy Use and Control in Ag Systems II	3
Ag. Engg.	505 581	Prof. Practice in Ag.E.	1
		Hum. or Soc. Sci. Elec.*	3
		Technical Electives**	8/7
			15/14

Number of hours required for graduation is 131.

*Humanities and social science electives are to be selected from the approved catalog list.

**To be chosen with the advice and approval of the faculty adviser and department head.

The engineering science requirements will be satisfied by the required courses in this curriculum.

Any student is allowed to apply a maximum of four (4) hours of basic ROTC credit toward a degree without being required to take more credits than non-ROTC students.

CURRICULUM IN ARCHITECTURAL ENGINEERING

B.S. in Architectural Engineering

FRESHMAN

Fall Semester		Course	Sem. Hrs.
Pre-des. Prof.	104 210	Design Graph. I	3
English	229 100	English Composition I	3
Art	290	Elective	2
Mathematics	245 220	Anal. Geom. & Calc. I	4
Chemistry	221 210	Chemistry I	4
Phys. Ed	261 101	Concepts in Phys. Ed.	1
Arch. Engg.	510 020	Arch. Engg. Seminar	0
			17
Spring Semester			
Pre-des. Prof.	104 211	Design Graph. II	3
English	229 120	English Composition II	3
Arch. Engg.	510 100	Arch. Engg. Orientation	2
Mathematics	245 221	Anal. Geom. & Calc. II	4
Chemistry	221 230	Chemistry II	4
Arch. Engg	510 020	Arch. Engg. Seminar	0
			16

SOPHOMORE

Fall Semester			
Pre-des. Prof.	104 260	Envir. Des. Stu. I	4
Speech	2B1 105	Oral Communication I	2
Const. Sci.	515 320	Construction Materials	2
Physics	265 213	Engg Physics I	5
Mathematics	245 222	Anal. Geom. & Calc. III	4
Arch. Engg.	510 020	Arch. Engg. Seminar	0
			17
Spring Semester			
Pre-des. Prof.	104 261	Envir. Des. Stu. II	4
Arch.	105 301	Apprec. of Arch	3
Const. Sci.	515 210	Intro. Const. Prog.	3
Physics	265 214	Engg Physics II	5
		Limited Sci. Elec.**	3/4
Arch. Engg	510 020	Arch. Engg. Seminar	0
			18/19

JUNIOR

Fall Semester			
Arch. Engg.	510 411	Arch. Engg. Design I	3
Civil Engg	525 333	Statics	3
Const. Sci.	515 321	Const. Tech. & Detail	3
Civil Engg	525 212	El. Survey Engg	3
		Hum. or Soc. Sci. Elec.*	3
Arch. Engg.	510 020	Arch. Engg. Seminar	0
			15
Spring Semester			
Civil Engg	525 533	Mechanics Materials	3
Civil Engg.	525 534	Mech. Matls. Lab	1
Const. Sci.	515 325	Construction Drawing	3
Mech. Engg	560 512	Dynamics	3
Arch. Engg	510 412	Arch. Engg. Design II	3
		Hum. or Soc. Sci. Elec.*	3
Arch. Engg	510 020	Arch. Engg. Seminar	0
			16

SENIOR

Fall Semester			
Civil Engg	525 537	Intro. to Struc. Anal	4
Arch. Engg	510 523	Timber Structures	3
Geology	234 100	Geology I	3
Mech. Engg	560 513	Thermodynamics	3
		Hum. or Soc. Sci. Elec.*	3
Arch. Engg	510 020	Arch. Engg. Seminar	0
			16
Spring Semester			
Arch. Engg	510 524	Theory of Struc. II (steel)	4
Mech. Engg	560 571	Fluid Mechanics	3
Arch. Engg.	510 536	Sanitation Systems	3
Arch. Engg.	510 537	Acoustic Systems	2
		Hum. or Soc. Sci. Elec.*	3
Arch. Engg.	510 020	Arch. Engg. Seminar	0
			15

FIFTH YEAR

Fall Semester			
Arch. Engg.	510 52B	Theory of Struc. III (concrete)	4
Elec. Engg	530 519	Elec. Circuits & Control	4
Arch. Engg.	510 534	Thermal Systems	3
Civil Engg	525 522	Soil Mechanics I	3
Arch. Engg.	510 020	Arch. Engg. Seminar	0
			14
Spring Semester			
Arch. Engg.	510 780	Theory of Struct. IV	3
Arch. Engg	510 535	Lighting Systems	3
Civil Engg.	525 52B	Foundation Engg.	3
		Free Elective	7/6
Arch. Engg.	510 020	Arch. Engg. Seminar	0
			16/15

Number of hours required for graduation is 160.

*Humanities and social science electives are to be selected from the approved catalog list.

**Limited science elective is to be taken from the following: Operations Research (3), Series and Diff. Equations (4), and Elements of Statistics (3).

Any student may apply a maximum of four (4) hours of basic ROTC credit toward the degree without being required to take more credits than non-ROTC students

CURRICULUM IN CONSTRUCTION SCIENCE

B.S. in Construction Science

FRESHMAN

			Course	Sem. Hrs.
Fall Semester				
	English	229 100	English Composition I	3
	Mathematics	245 220	Anal. Geom. & Calc. I****	4
	Pre-des. Prof.	104 210	Design Graphics I	3
	Speech	281 105	Oral Communication I	2
	Economics	225 110	Economics I	3
	Const. Sci.	515 016	Construction Seminar	0
				15
Spring Semester				
	English	229 120	English Composition II	3
	Civil Engg.	525 212	El. Survey Engg.	3
	Pre-des. Prof.	104 211	Des. Graph. II	3
	Const. Sci.	515 210	Intro. Const. Prog.	3
	Physics	265 113	General Physics I	4
	Phys. Ed.	261 101	Concepts in P.E.	1
	Const. Sci.	515 016	Construction Seminar	0
				17

SOPHOMORE

Fall Semester				
	Const. Sci.	515 320	Const. Materials	2
	Const. Sci.	515 321	Const. Tech. & Detail	3
	Civil Engg.	525 231	Statics A	3
	Const. Sci.	515 250	Site Construction	3
	Geology	234 100	Geology I	3
			Hum. or Soc. Sci. Elec.*	3
	Const. Sci.	515 016	Construction Seminar	0
				17
Spring Semester				
	Const. Sci.	515 325	Construction Drawing	3
	Civil Engg.	525 331	Str. of Matls. A	3
	Civil Engg.	525 332	Str. of Matls. A Lab.	1
	Architecture	105 301	Apprec. of Architecture	3
	Bus. Admin.	305 260	Fund. of Accounting	3
			Hum. or Soc. Sci. Elec.*	3
	Const. Sci.	515 016	Construction Seminar	0
				16

JUNIOR

Fall Semester				
	Arch. Engg.	510 522	Theory of Struc. I	3
	Arch. Engg.	510 523	Timber Structures	3
	Arch. Engg.	510 537	Acoustic Systems	2
	Arch. Engg.	510 535	Lighting Systems	3
	Const. Sci.	515 540	Const. Prob. 1	3
	Bus. Admin.	305 292	Business Law I	3
	Const. Sci.	515 016	Construction Seminar	0
				17
Spring Semester				
	Arch. Engg.	510 524	Theory of Struc. II (Steel)	4
	Arch. Engg.	510 534	Thermal Systems	3
	Ind. Engg.	550 501	Industrial Mgmt.	3
	Statistics	285 320	El. Statistics	3
			OR	
	Statistics	285 350	Bus. & Econ. Stat.	
			Hum. or Soc. Sci. Elec.*	3
	Const. Sci.	515 016	Construction Seminar	0
				16
Fall Semester				
	Arch. Engg.	510 528	Theory Struc. III (Concrete)	4
	Const. Sci.	515 541	Const. Estim.	3
	Const. Sci.	515 542	Const. Mgmt. I	3
			Hum. or Soc. Sci. Elec.*	3
			Elective***	4
	Const. Sci.	515 016	Construction Seminar	0
				17
Spring Semester				
	Const. Sci.	515 543	Const. Mgt. II	3
	Civil Engg.	525 322	Soil & Fdn. Const.	3
	Arch. Engg.	510 536	Sanitation Systems	3
			Labor Elective**	3
			Elective***	3
	Const. Sci.	515 016	Construction Seminar	0
				15

Number of hours required for graduation is 130.

*Humanities and social science electives are to be selected from the approved catalog list.

**Labor elective can be selected from one of the following three courses: 225 620, Labor Economics (3); 305 530, Labor Legislation (3); or 305 630, Industrial Relations (3).

***These electives to be selected and approved after consultation with the student's faculty adviser.

****Technical Calculus I & II may be taken in lieu of Anal. Geometry & Calculus I.

Any student may apply a maximum of four (4) hours of basic ROTC credit toward the degree without being required to take more credits than non-ROTC students.

CURRICULUM IN CHEMICAL ENGINEERING

B.S. in Chemical Engineering

FRESHMAN

			Course	Sem. Hrs.
Fall Semester				
	English	229 100	English Composition I	3
	Chemistry	221 210	Chemistry I	4
	Mathematics	245 220	Anal. Geom. & Calc. I	4
	Economics	225 110	Economics I	3
	Speech	281 105	Oral Communication I	2
	Phys. Ed.	261 101	Concepts in Phys. Ed.	1
	Gen. Engg.	500 010	Engineering Lectures	0
				17
Spring Semester				
	English	229 120	English Composition II	3
	Chemistry	221 230	Chemistry II	4
	Chemistry	221 271	Chemical Analysis	4
	Mathematics	245 221	Anal. Geom. & Calc. II	4
			Elective*	3
	Chem. Engg.	520 015	Engineering Assembly	0
				18

SOPHOMORE

Fall Semester				
	Mathematics	245 222	Anal. Geom. & Calc. III	4
	Physics	265 213	Engg. Physics I	5
	Chemistry	221 531	Organic Chemistry I	3
	Chemistry	221 532	Organic Chem. I Lab.	2
			Elective*	3
	Chem. Engg.	520 015	Engineering Assembly	0
				17
Spring Semester				
	Mathematics	245 240	Series & Diff. Equations	4
	Physics	265 214	Engg. Physics II	5
	Chemistry	221 550	Organic Chemistry II	3
	Chem. Engg.	520 314	Intro. to Proc. Anal.	3
	Chem. Engg.	520 316	Ch.E. Computational Tech.	1
	Chem. Engg.	520 015	Engineering Assembly	0
				16

JUNIOR

Fall Semester				
	Chemistry	221 585	Physical Chemistry I	3
	Chemistry	221 586	Physical Chem. I Lab.	2
	Chem. Engg.	520 520	Ch.E. Thermodynamics I	2
	Chem. Engg.	520 530	Transport Phenomena I	3
			Elective*	6
	Chem. Engg.	520 015	Engineering Assembly	0
				16
Spring Semester				
	Chemistry	221 595	Physical Chemistry II	3
	Chem. Engg.	520 522	Chem. Engg. Lab. I	2
	Chem. Engg.	520 521	Ch.E. Thermodynamics II	3
	Chem. Engg.	520 531	Transport Phenomena II	3
			Elective*	6
	Chem. Engg.	520 015	Engineering Assembly	0
				17

SENIOR

Fall Semester				
	Chem. Engg.	520 532	Chem. Engg. Lab. II	2
	Chem. Engg.	520 560	Separational Proc. Des.	2
	Chem. Engg.	520 550	Chemical Reaction Engg.	3
	Chem. Engg.	520 570	Ch.E. Systems Design I	3
			Elective*	6
	Chem. Engg.	520 015	Engineering Assembly	0
				16
Spring Semester				
	Chem. Engg.	520 542	Chem. Engg. Lab. III	2
	Chem. Engg.	520 561	Ch.E. Proc. Dyn. & Control	3
	Chem. Engg.	520 571	Ch.E. Systems Design II	3
			Elective*	9
	Chem. Engg.	520 015	Engineering Assembly	0
				17

Number of hours required for graduation is 134

*Fifteen hours of electives must be selected from the list of humanities and social science electives. The remaining 18 hours are technical electives, a tentative selection of which must be made in consultation with the faculty adviser prior to the junior year. All electives must have the approval of the department head and technical electives must meet the engineering science requirements.

Any student is allowed to apply a maximum of four (4) hours of basic ROTC credit toward his degree without being required to take more credits than non-ROTC students.

CURRICULUM IN CIVIL ENGINEERING

B.S. in Civil Engineering

FRESHMAN

Fall Semester			**Course**	**Sem. Hrs.**
Mathematics	245	220	Anal. Geom. & Calc. I	4
Chemistry	221	210	Chemistry I	4
English	229	100	English Composition I	3
Mech. Engg.	560	212	Graphical Comm. Anal. & Des. I	2
Gen. Engg.	500	160	Engineering Concepts	2
Phys. Educ.	261	101	Concepts in Phys. Ed.	1
				16
Spring Semester				
Mathematics	245	221	Anal. Geom. & Calc. II	4
Chemistry	221	230	Chemistry II	4
English	229	120	English Composition II	3
Speech	281	105	Oral Communication I	2
Economics	225	110	Economics I	3
Civil Engg.	525	015	Engineering Assembly	0
				16

SOPHOMORE

Fall Semester				
Mathematics	245	222	Anal. Geom. & Calc. III	4
Physics	265	213	Engg. Physics I	5
Civil Engg.	525	333	Statics	3
			Technical Elective**	2
Civil Engg.	525	212	Elem. Surveying Engg.	3
Civil Engg.	525	015	Engineering Assembly	0
				17
Spring Semester				
Mathematics	245	240	Series & Diff. Equations	4
Physics	265	214	Engg. Physics II	5
Civil Engg.	525	533	Mechanics of Materials	3
			Technical Elective**	2
Geology	234	100	Geology I	3
Civil Engg.	525	015	Engineering Assembly	0
				17

JUNIOR

Fall Semester				
Civil Engg.	525	411	Route Location & Design	4
Mech. Engg.	560	512	Dynamics	3
Mech. Engg.	560	513	Thermodynamics I	3
Civil Engg.	525	551	Hydrology	2
Civil Engg.	525	553	Hydrologic Meth. Lab.	1
			Technical Elective**	3
Civil Engg.	525	015	Engineering Assembly	0
Civil Engg.	525	534	Mech. of Materials Lab.	1
				17
Spring Semester				
Civil Engg.	525	537	Intro. to Structural Anal.	4
Mech. Engg.	560	571	Fluid Mechanics	3
Civil Engg.	525	522	Soil Mechanics I	3
Civil Engg.	525	563	Sanitary Engg. Fund.	3
			Hum. or Soc. Sci. Elec.*	3
Civil Engg.	525	015	Engineering Assembly	0
				16

SENIOR

Fall Semester				
Civil Engg.	525	015	Engineering Assembly	0
			Civil Engg. Elec.***	12
			Hum. or Soc. Sci. Elec.*	5
				17
Spring Semester				
Civil Engg.	525	015	Engineering Assembly	0
			Civil Engg. Elec.***	6
			Hum. or Soc. Sci. Elec.*	6
			Technical Elec.**	5
				17

Number of hours required for graduation is 133

* Humanities and social science electives are to be selected from the approved list.

** Twelve hours of technical electives are required. One course in computer programming or equivalent programming experience and one course from either the engineering materials or the circuits, fields and electronics engineering sciences groups are required. The remaining hours may be chosen upon consultation with the student's faculty adviser from the areas of mathematics, science or engineering.

*** Civil engineering electives are to be selected from the list approved by the department.

Any student may apply a maximum of four (4) hours of basic ROTC credit toward the degree without being required to take more credits than non-ROTC students.

CURRICULUM IN ELECTRICAL ENGINEERING

B.S. in Electrical Engineering

FRESHMAN

Fall Semester			**Course**	**Sem. Hrs.**
English	229	100	English Composition I	3
Chemistry	221	210	Chemistry I	4
Mathematics	245	220	Anal. Geom. & Calc. I	4
Gen. Engg.	500	160	Engineering Concepts	2
Mech. Engg.	560	212	Graph. Comm., Anal. & Des. I	2
				15
Spring Semester				
English	229	120	English Composition II	3
Chemistry	221	230	Chemistry II	4
Mathematics	245	221	Anal. Geom. & Calc. II	4
Speech	281	105	Oral Communication I	2
Computer Sci.	286	200	Fund. of Comp. Prog.	2
Computer Sci.	286		Language Lab.	1
Phys. Ed.	261	101	Concepts in Phys. Ed.	1
				17

SOPHOMORE

Fall Semester				
Physics	265	213	Engg. Physics I	5
Mathematics	245	222	Anal. Geom. & Calc. III	4
Civil Engg.	525	333	Statics	3
Elec. Engg.	530	241	Intro. to Computer Engg.	3
Economics	225	110	Economics I	3
				18
Spring Semester				
Physics	265	214	Engg. Physics II	5
Mathematics	245	240	Series & Diff. Equations	4
Mech. Engg.	560	512	Dynamics	3
Elec. Engg.	530	510	Circuit Theory I	3
			Hum. or Soc. Sci. Elec.*	3
				18

JUNIOR

Fall Semester				
Elec. Engg.	530	511	Circuit Theory II	4
Elec. Engg.	530	557	Electromag. Theory I	4
Elec. Engg.	530	525	Electronics I	3
Elec. Engg.	530	501	E.E. Lab. I	2
			Hum. or Soc. Sci. Elec.*	3
				16
Spring Semester				
Elec. Engg.	530	526	Electronics II	3
Elec. Engg.	530	581	Energy Conversion I	3
Elec. Engg.	530	502	E.E. Lab. II	2
			Option Elective†	3
			Complementary Elective**	3
			Hum. or Soc. Sci. Elec.*	3
				17

SENIOR

Fall Semester				
Mech. Engg.	560	513	Thermodynamics I	3
Elec. Engg.	530	530	Control Sys. Design	3
			Option Elec.†	3
			Complementary Elec.**	3
			Hum. or Soc. Sci. Elec.*	3
				15
Spring Semester				
Elec. Engg.	530	590	E.E. Seminar	1
			Option Elec.†	5
			Complementary Elec.**	8
			Hum. or Soc. Sci. Elec.*	3
				17

Number of hours required for graduation is 133.

* 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.

** Fourteen semester hours of complementary electives and Mechanical Engineering 212 or sixteen semester hours of complementary electives, including a minimum of 3 semester hours from mathematics or statistics, must be selected from an approved list of science and engineering courses upon consultation with the student's faculty adviser. Note should be taken of the engineering science requirements.

†Eleven semester hours of option electives must be selected from electrical engineering courses upon consultation with adviser.

Any student may apply a maximum of four (4) hours of basic ROTC credit toward a degree without being required to take more credits than non-ROTC students.

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 enable concentration in one area. Examples of such areas are communications systems, digital systems, electromagnetic theory and applications, electronics, electric energy systems, linear systems theory and microelectronics.

Bioengineering

A student pursuing the option of bioengineering within the Electrical Engineering Department can fulfill the requirements for a B.S. in electrical engineering by following the outlined core curriculum listed for electrical engineering. A suggested set of life science courses which should be included in the bioengineering option follows:

Life Science Component of Bioengineering Option

*Chemistry	221 350	General Organic Chemistry	3
Chemistry	221 351	General Organic Chem. Lab.	2
*Biochemistry	211 521	General Biochemistry	3
Biology	215 505	Comp. Anat. of Vertebrates	4
		OR	
Biology	215 525	Human Physiology	4
*Physiology	740 530	Anatomy and Physiology	4

* Minimum set of 10 semester hours that should be included in the Complementary Electives.

The above courses will be used as complementary electives in the electrical engineering curriculum. Upon consultation with an academic adviser the student must select from the list of option electives those which would complement a strong electrical engineering core curriculum and the bioengineering option.

Computer Engineering

A student pursuing the option of computer engineering within the Electrical Engineering Department can fulfill the requirements for a B.S. in electrical engineering by following the outlined core curriculum listed for electrical engineering. The following courses will be required as complementary and option electives.

Computer Sci.	286 305	Comp. Org. & Prog. I	3
Elec. Engg.	530 641	Design of Digital Systems I	3
Elec. Engg.	530 643	Comp. Logic Lab.	1

CURRICULUM IN INDUSTRIAL ENGINEERING

B.S. in Industrial Engineering

FRESHMAN

Fall Semester		Course	Sem. Hrs.
English	229 100	English Composition I	3
Mathematics	245 220	Anal. Geom. & Calc. I	4
Chemistry	221 210	Chemistry I	4
Economics	225 110	Economics I	3
Gen. Engg.	500 160	Engineering Concepts	2
Phys. Ed.	261 101	Concepts in Phys. Ed.	1
			17

Spring Semester			
English	229 120	English Composition II	3
Mathematics	245 221	Anal. Geom. & Calc. II	4
Chemistry	221 230	Chemistry II	4
Ind. Engg.	550 120	Intro. to Ind. Engg.	2
		Hum. or Soc. Sci. Elec.*	3
Ind. Engg.	550 015	Engineering Assembly	0
			16

SOPHOMORE

Fall Semester			
Physics	265 213	Engineering Physics I	5
Mathematics	245 222	Anal. Geom. & Calc. III	4
Bus. Admin.	305 260	Fund. of Accounting	3
Ind. Engg.	550 241	Production Processes	3
Ind. Engg.	550 372	Computers & Data Processing	2
Ind. Engg.	550 015	Engineering Assembly	0
			17

Spring Semester			
Physics	265 214	Engineering Physics II	5
Mathematics	245 240	Series & Diff. Equations	4
Ind. Engg.	550 352	Tool Engineering	3
		Hum. or Soc. Sci. Elec.*	3
Mech. Engg.	560 212	Graph. Comm., Anal. & Des. I	2
Ind. Engg.	550 015	Engineering Assembly	0
			17

JUNIOR

Fall Semester			
Elec. Engg.	530 519	Elec. Circuits & Controls	4
Statistics	285 510	Intro. Prob. & Stat. I	3
Ch.E Engg.	520 350	Engg. Materials	2
Ch.E Engg.	520 351	Engg. Materials Lab.	1
Ind. Engg.	550 551	Work Design	3
Civil Engg.	525 530	Statics & Dynamics	4
Ind. Engg.	550 015	Engineering Assembly	0
			17

Spring Semester			
Civil Engg.	525 533	Mech. of Materials	3
Mech. Engg.	560 513	Thermodynamics I	3
Ind. Engg.	550 541	Engg. Rel. & Qual. Assur. I	3
Statistics	285 511	Intro. Prob. & Stat. II	3
Ind. Engg.	550 501	Industrial Management	3
Ind. Engg.	550 050	Ind. Plant Studies	0
Ind. Engg.	550 015	Engineering Assembly	0
			15

SENIOR

Fall Semester			
Ind. Engg.	550 553	Prod. Plan. & Inv. Control	3
Ind. Engg.	550 530	Ind. Proj. Eval.	3
Ind. Engg.	550 571	Intro. Oper. Res. I	3
Ind. Engg.	550 502	Ind. Management II	3
		Hum. or Soc. Sci. Elec.*	6
Ind. Engg.	550 015	Engineering Assembly	0
			18

Spring Semester			
		Tech. Electives**	9
Ind. Engg.	550 554	Ind. Fac. Layout Des.	3
		Hum. or Soc. Sci. Elec.*	3
Ind. Engg.	550 015	Engineering Assembly	0
			15

Number of hours required for graduation is 132.

* Humanities and social science electives must be selected from the approved list and need not be taken in the order listed in the curriculum.

** Must be selected from the following five courses: 550-552 Process Engineering (3); 550-572 Intro. to Oper. Res. II (3); 550-573 Indus. Simulation (3); 550-609 Occupational Safety and Health (3); or 550-625 The Man-Environment System (3).

Any student may apply a maximum of four (4) hours of basic ROTC credit toward the degree without being required to take more credits than non-ROTC students.

CURRICULUM IN MECHANICAL ENGINEERING

B S in Mechanical Engineering

FRESHMAN

Fall Semester		Course	Sem. Hrs.
Chemistry	221 210	Chemistry I	4
English	229 100	English Composition I	3
Mathematics	245 220	Anal. Geom. & Calc. I	4
Phys. Ed.	261 101	Concepts in Phys Ed.	1
Speech	281 105	Oral Communications I	2
Gen Engg	500 160	Engineering Concepts	2
			16

Spring Semester			
Chemistry	221 230	Chemistry II	4
English	229 120	English Composition II	3
Mathematics	245 221	Anal. Geom & Calc. II	4
Ind. Engg.	550 241	Production Processes	3
Mech. Engg	560 212	Graph Comm., Anal. & Des. I	2
			16

SOPHOMORE

Fall Semester			
Economics	225 110	Economics I	3
Mathematics	245 222	Anal. Geom & Calc. III	4
Physics	265 213	Engg Physics I	5
Ind. Engg.	550 372	Comp. & Data Processing	2
Mech. Engg	560 217	Graph. Comm., Anal & Des. II	3
			17

Spring Semester			
Mathematics	245 240	Series & Diff. Equations	4
Physics	265 214	Engg Physics II	5
Chem Engg	520 350	Engineering Materials	2
Civil Engg.	525 333	Statics	3
		Hum or Soc. Sci. Elec.*	3
			17

JUNIOR

Fall Semester			
Civil Engg.	525 533	Mech. of Materials	3
Elec. Engg.	530 519	Electric Circuits & Control	4
Chem. Engg	520 351	Engg Materials Lab	1
Mech. Engg.	560 513	Thermodynamics	3
Mech. Engg.	560 512	Dynamics	3
		Hum or Soc. Sci. Elec.*	3
			17

Spring Semester			
Elec. Engg.	530 589	Circuits & Machine Lab.	2
Mech. Engg.	560 523	Thermodynamics II	3
Mech. Engg.	560 533	Machine Design I	3
Mech. Engg.	560 535	Mech. Engg Lab. I	3
Mech. Engg.	560 571	Fluid Mechanics	3
		Hum. or Soc. Sci. Elec.*	3
			17

SENIOR

Fall Semester			
Mech. Engg.	560 527	Heat Transfer	3
Mech. Engg.	560 583	Mech. Engg. Lab. II	2
Mech. Engg.	560 560	Engineering Economics	3
		Technical Elective**	6
		Hum. or Soc. Sci. Elec.*	3
			17

Spring Semester			
Mech. Engg	560 563	Machine Design II	3
Mech. Engg	560 575	Mech. Engg. Design Lab.	2
		Technical Elective**	9
		Hum. or Soc. Sci. Elec.*	3
			17

Number of hours required for graduation is 134.

*Humanities and social science electives are to be selected from the approved list.

**To be chosen with the advice and approval of the faculty adviser and department head Of the fifteen 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.

The engineering science requirements will be satisfied by the required courses in this curriculum. Any student may apply a maximum of four (4) hours of basic ROTC credit toward his degree without being required to take more credits than non-ROTC students.

CURRICULUM IN NUCLEAR ENGINEERING

B.S. in Nuclear Engineering

FRESHMAN

Fall Semester		Course	Sem. Hrs.
Nuc. Engg.	580 110	Nuclear Engg. Concepts	2
English	229 100	English Composition I	3
Economics	225 110	Economics I	3
Mathematics	245 220	Anal. Geom & Calc. I	4
Phys. Ed.	261 101	Concepts in Phys. Ed.	1
Chemistry	221 210	Chemistry I	4
			17

Spring Semester			
Nuc. Engg	580 116	Nuc. Engg. Seminar	1
English	229 120	English Composition II	3
Chemistry	221 230	Chemistry II	4
Mathematics	245 221	Anal. Geom. & Calc. II	4
Physics	265 213	Engineering Physics I	5
			17

SOPHOMORE

Fall Semester			
Nuc. Engg.	580 325	Elem. Nuclear Engg	3
Chem. Engg.	520 350	Engg Materials	2
Chem. Engg	520 351	Engg Materials Lab.	1
Physics	265 214	Engg Physics II	5
Mathematics	245 222	Anal Geom. & Calc. III	4
		Hum or Soc. Eci. Elec.*	3
			18

Spring Semester			
Nuc. Engg.	580 315	Intro. Nuc. Engg. Analysis	3
Elec. Engg	530 510	Circuit Theory I	3
Civil Engg.	525 530	Statics & Dynamics	4
		Hum. or Soc. Sci. Elec.*	6
			16

JUNIOR

Fall Semester			
Nuc. Engg	580 511	Rad Appl. Engg	2
Nuc. Engg	580 500	App. Nuc. Engg. Anal.	3
Nuc. Engg.	580 490	Neut & Part. Inter. I	2
Mech Engg	560 513	Thermodynamics I	3
Elec. Engg	530 525	Electronics I	3
		Hum. or Soc. Sci. Elec.*	3
			16

Spring Semester			
Nuc. Engg	580 630	App. Reactor Theory	4
Nuc. Engg	580 515	Nuclear Engg. Materials	2
Mech. Engg.	560 571	Fluid Mechanics	3
		Technical Electives**	6
			15

SENIOR

Fall Semester			
Nuc. Engg	580 613	Nuclear Fuel Cycle	3
Nuc. Engg.	580 555	Nuclear Reactor Fund	3
Nuc. Engg.	580 655	Rad. Prot Engg	3
Nuc. Engg	580 640	React. Oper. Lab.	2
		Technical Electives**	5
			16

Spring Semester			
Nuc. Engg.	580 692	Nuc. Reactor Design	3
Nuc. Engg.	580 695	Nuc. Reactor Lab.	1
		Technical Electives**	9
		Hum. or Soc. Sci. Elec.*	3
			16

Number of hours required for graduation is 131.

*Humanities and social science electives are to be selected from the catalog list

**A tentative technical elective program of study is chosen in consultation with the student's adviser and presented for approval to the departmental faculty no later than the second semester of the sophomore year

Any student may apply a maximum of four (4) hours of basic ROTC credit toward a degree without being required to take more credits than non-ROTC students

Engineering Technology

B. S. in Engineering Technology 120 semester hours required

Engineering technology is a new and 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 and less mathematical than that for the engineering students and is oriented more towards hardware and applications.

I. General Requirements (51 & 52 hours)

229 100	English Composition I	3
229 120	English Composition II	3
281 105	Oral Communication I	2
245 100	College Algebra	3
245 150	Plane Trigonometry	3
245 210	Technical Calculus I	3
245 211	Technical Calculus II	3
265 113	General Physics I	4
265 114	General Physics II	4
221 110	General Chemistry	5
	OR	
221 210	Chemistry I	4
285 320	Elements of Statistics	3
261 101	Concepts in Phys. Ed.	1
	Soc. Sci. or Hum. Electives	15
		51/52

II. Engineering Technology Core (14 hours)

560 212	Graphical Communications I	2
550 372	Computers & Data Processing	2
540 510	Properties of Engineering Materials	3
540 530	Electrical Circuit Tech. I	4
540 532	Instrumentation & Meas. Tech.	3
		14

III. Management Electives (6 hours)

IV. Free Electives (8/9 hours)

AREA OF SPECIALIZATION

Civil Engineering Technology

The field of civil engineering technology is very broad. It includes the areas of surveying and mapping, transportation, hydraulics, sanitary, structural, geotechnical, materials, and construction technology. The civil engineering technology program is planned to give the student basic background in all of these areas and to provide the opportunity for specialization in one or more of the areas. Employment opportunities for B.S. graduates include all levels of government, consulting engineering firms, and the construction industry.

Required Courses (20 hours)

Statics A	3
Strength of Materials A	3
Strength of Materials Lab.	1
Elem. Surveying Engg.	3
Graphical Com. Anal. & Des. II	3
Mechanics of Fluids	3
Route Location & Design	4
	20

Area Electives (20 hours)

Elective topics include structures, water and waste treatment, construction, geology, building systems, etc.

Computer Engineering Technology

This program is designed to provide a basic understanding of the area of digital computer technology. The major emphasis is placed on hardware aspects of the subject, but through use of required and elective courses in computer science, the student has an opportunity to become proficient with programming aspects as well.

Graduates will find initial employment closely paralleling the opportunities of an engineering graduate with a similar background, although with more emphasis on immediate applications such as production process development and process design. Opportunities also exist in the area of technical sales and service.

Required Courses (29 hours)

286 300	Algo. Processes	3
286 305	Comp. Org. & Prog. I	3
530 525	Electronics I	3
530 526	Electronics II	3
540 430	Electronic Fabrication Lab	2
540 531	Electrical Circuit Technology II	3
540 534	Auto. Controls Tech.	3
540 535	Dig. Logic Sys. I	4
540 536	Dig. Logic Sys. II	4
540 538	Seminar	1

Area Electives (11 hours)

Electronic Engineering Technology

This program is designed to provide the basic education necessary for a career in one of the many areas of the electrical/electronics industry. Graduates will find initial employment closely paralleling the opportunities of the engineering graduate, although with more emphasis on immediate applications in production management, process and product development, quality control and process design. Opportunities also exist in the areas of technical sales and service.

Required Courses (30 hours)

530 525	Electronics I	3
530 526	Electronics II	3
530 625	Integrated Cir. Engg.	3
540 430	Electronic Fabrication Lab	2
540 531	Electrical Circuit Technology II	3
540 534	Auto Controls Tech.	3
540 535	Dig. Logic Sys. I	4
540 536	Dig. Logic Sys. II	4
540 537	Elec. Measurements Lab.	1
540 538	Seminar	1
550 241	Production Processes	3

Area Electives (12 hours)

Environmental Engineering Technology

Concern about environmental quality has resulted in a significant increase in the number of trained personnel needed to implement pollution prevention and control activities. Much of this activity relates to concern over providing safe supplies of water and safely disposing of domestic and industrial wastes, in addition to protecting and restoring the quality of the total environment.

Employment opportunities at the B.S. level include: inspection and field monitoring to assure compliance with the various pollution standards; assisting engineers in the design, construction, inspection and maintenance of facilities to handle water supplies, sanitary wastes, storm runoff, etc.; performing chemical and biological laboratory tests incidental to the protection and restoration of the environment.

Required Courses (35 hours)

215 198	Principles of Biology	4
215 530	Ecology	3
221 230	Chemistry II	4
221 240	Environmental Chemistry Lab	1
500 202	Intro. to Environmental Tech	3
540 512	Mechanics of Fluids	3
540 514	Energy Conversion Technology	3
540 522	Air Pollution Control Tech. (Water Quality)	2
525 563	Sanitary Engineering Fund	3
540 520	Wastewater Treatment Tech	3
540 521	Water Treatment Technology	3
525 551	Hydrology	2
525 553	Hydrologic Methods Lab or (Radiation Protection)	1
540 580	Nuclear Engineering Tech.	4
540 581	Nuclear Radiation Meas	3
540 582	Radiation Protection Tech.	5

Area Electives (5 hours)

Food Engineering Technology

This program provides the student with an engineering technology education directed toward a career in the food industry. The food industry is large and of considerable economic and social significance in Kansas, the U.S., and the world. Employment opportunities at the B.S. level include production management, technical service, product and process development, process design, project engineering, and quality control. Food preservation operations, fermentation operations, soybean processing, freeze drying, cereal grain processing, processing of dairy products, processing of fruits and vegetables, and meat processing are examples of activities that require the skills of food scientists, food engineering technologists, and engineers.

Recommended Program (40 hours)

A. At least 10 additional hours of chemistry including courses in organic and biochemistry	10
B. Microbiology or Dairy Bacteriology	4
C. Engineering Technology Courses	
Energy Conversion Technology	3
Technology of Fluids	3
Food Processing Operations I and II	8
D. Applied Food Science and Industry Electives	12

Mechanical Engineering Technology

Industrial growth and the increased technical requirements associated with it have greatly increased the need for technically trained personnel. The mechanical engineering technologist, a vital member of the industrial design team, applies practical approaches to problems in many different technical fields. Component and system design in the aerospace, farm machinery, power and chemical industries are examples of opportunities that exist in Kansas and nationwide. Opportunities also exist in development and testing laboratories as well as in the design of products or production facilities.

Required Courses (32 hours)

560 217	Graphical Comm., Anal. & Des. II	3
525 231	Statics A	3
540 514	Energy Conversion Technology	3
550 241	Production Processes	3
525 331	Strength of Materials A	3
525 332	Strength of Materials A Lab.	1
540 560	Kinematics & Mechanism	3
540 561	Machine Design	3
540 562	Mechanical Design Lab I	2
540 563	Mechanical Design Lab II	2
540 534	Automatic Control Technology	3
540 512	Mechanics of Fluids	3

Area Electives (8 hours)

Elective topics include tool engineering, material processing, foundry, heat treatment, material testing, etc.

Production Management Technology

For young men and women interested in a career in manufacturing, the production management program provides excellent preparation. The curriculum emphasizes management, work measurement, production economics, plant layout, and quality control, all of which are important for the industrial fabrication of consumer products.

Graduates are prepared for employment in supervisory or staff positions in a variety of manufacturing organizations.

Required Courses (31 hours)

IE 241	Prod. Processes	3
IE 501	Ind. Mgmt. I	3
IE 530	Ind. Proj. Eval.	3
IE 352	Tool Engg.	3
IE 551	Work Design	3
IE 609	Occ. Safety & Health	3
IE 554	Indus. Facilities Layout & Des.	3
ET 551	Materials Processes	4
IE 541	Engg. Reliability & Qual. Assur. I	3
CE 231	Statics A	3

Area Electives (9 hours)

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:

1. A minimum of 30 semester hours of engineering science courses.

2. At least 9 semester hours of engineering science courses outside the student's major department.

3. At least four of the five subject areas in the following list must be represented in the 30 semester hours.

1. Engineering Materials

a. Ch E 350 Engineering Materials (2)
b. NE 515 Nuclear Engineering Materials (2)
c. EE 695 Solid State Engineering (3)

2. Analytical Mechanics

Either
CE 333 Statics (3)
and
ME 512 Dynamics (3)
or
CE 530 Statics and Dynamics (4)

3. Circuits, Fields, & Electronics

a. EE 510 Circuit Theory I (3)
b. EE 519 Elect. Circuits & Controls (4)
c. EE 557 Electromagnetic Theory (4)

4. Thermodynamics

a. ChE 515 Chem. Engg. Thermo. I (2)
b. ME 513 Thermodynamics (3)

5. Flow & Rate Processes

a. ME 571 Fluid Mechanics (3)
b. ChE 530 Transport Phenomena I (3)

Note—It should be recognized that there are other courses in these subject areas which may properly be considered engineering sciences. In addition, there are areas of engineering science which are not listed.

Humanities And Social Science Electives For College Of Engineering Students

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.

Art—Any course
Economics—Any course above Economics 110
English—Any course above those required
Geography—Any course
History—Any course
Journalism—289 235 Survey of the Mass Media (3)
Modern Languages—At least eight hours
Music—Any course
Philosophy—Any course except Philosophy 220
Political Science—Any course
Psychology—Any course
Sociology and Anthropology—Any course
Speech—Any course in "Theatre and Interpretation"
Architecture and Design—Any course in history or appreciation of architecture
Engineering—500 250 Impact of Engineering Technology on Society (3)
Home Economics—630 605 Consumers and the Market (3)

From the areas listed above at least two courses must be taken at the 400 level or above; however, not more than three credit hours may be taken in applied music and/or applied art.

Interdisciplinary Study

Although engineering curriculums 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 his adviser 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 on dual degrees could be appropriate technical electives for students with goals in the management area.

Pre-Medicine. Many of the recent advances in medical research techniques, patient monitoring systems, artificial limbs and organs, aerospace and undersea medicine have been developed from the partnership of medicine and engineering. It seems certain that this interrelationship will continue to grow, and an education in both fields will be highly desirable. 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 (215 198 plus one of the following: 215 201, 215 535, 215 650). The pre-medicine adviser 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 adviser 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:

286 200	Fundamentals of Computer Programming
286 300	Introduction to Algorithmic Processes
286 305	Computer Organization and Programming I
286 405	Introduction to Programming Language

Design:

530 241	Introduction to Computer Engineering
530 643	Computer Logic Design
530 644	Digital Circuits Laboratory
530 641	Design of Digital Systems I

Computational Techniques:

520 316	Ch.E. Computational Techniques
530 649	Analog Computation
550 571	Introduction to Operations Research
550 573	Industrial Simulation
560 760	Engineering Analysis I
580 720	Nuclear Systems Analysis

Mathematics, Physics, Chemistry. Engineering students with interests in research should plan on graduate study. Preparation at the B.S. level could be enhanced by additional courses in mathematics and the basic sciences. Refer to the departmental listings on pages 115, 151, and 171 for possible electives.

Bio-Engineering. Bio-engineering is a very broad field overlapping the life sciences and many engineering disciplines. Some of the sub-areas are bio-mechanics, ergonomics, bio-instrumentation, bio-materials, bio-energetics, water and waste treatment, food engineering, and environmental engineering. In addition to the courses listed in the pre-medicine section, other courses of interest are:

505 312	Biological Materials and Machine Functions in Agriculture
505 510	Environmental Design of Farm Buildings
505 520	Energy Use and Control in Agricultural Systems I
505 570	Energy Use and Control in Agricultural Systems II
505 700	Agricultural Process Engineering
520 715	Biochemical Engineering
520 725	Biotransport Phenomena
525 563	Sanitary Engineering Fundamentals
525 565	Sanitary Engineering Design
525 761	Sanitary Engineering Chemistry
525 762	Water Treatment Systems
525 766	Wastewater Treatment Systems I
530 771	Control Theory Applied to Bioengineering
530 772	Theory and Techniques of Bioinstrumentation
550 551	Work Design
550 609	Occupational Safety and Health
550 625	The Man-Environment System
560 622	Environmental Engineering I
560 722	Environmental Engineering II
560 742	Fine Particle Technology

Food Engineering. Engineers are needed in the food industry for process development and design, equipment design and management of operations. Students with this interest should select technical electives to augment their 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 of the world. 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. Three programs of interest are listed below.

Engineering and Business Administration. Ordinarily the program must be commenced during the student's junior year and the following courses are required for the B.S. in Business Administration:

		Course	Sem. Hrs.
Bus. Admin	305 260	Fund of Accounting	3
Bus. Admin.	305 270	Managerial & Cost Controls	3
Economics	225 110	Economics I	3
Economics	225 120	Economics II	3
Bus. Admin.	305 292	Business Law I	3
Comp. Science	2B6 200	Fund of Comp Prog *	3
Bus. Admin.	305 420	Management Concepts	3
Bus. Admin.	305 421	Production Management	3
Bus. Admin.	305 450	Business Finance	3
Bus. Admin	305 440	Marketing	3
Bus. Admin.	305 695	Business Policy	3
Bus. Admin.	305 696	Business and Society	3
		Business electives	9
			45

*including lab.

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.

1. General requirements for B.S. degree in Arts and Sciences (see page 101).

2. Complete the following courses in geology:

	Course	Sem. Hrs.
234 200	Geology II	4
234 560	Mineralogy I	4
234 561	Mineralogy II	4
234 520	Geomorphology	4
234 630	Structural Geology	4
234 703	Stratigraphic Geology	4
234 71B	Field Geology	6
		30

Chemistry and Chemical Engineering. In addition to the required courses in chemical engineering, interested students should take:

	Course	Sem. Hrs.
221 551	Organic Chemistry II Lab.	2
221 597	Structure & Bonding	2
221 545	Chemical Separations	2
221 666	Instrumental Analysis	3
221 599	Undergraduate Research	3
253 121	German I	4
253 122	German II	4
221 667	Instrumental Analysis Lab	1
		21

Electives should be chosen to satisfy the humanities and social sciences requirements on page 241 and the engineering science requirements on page 241.

Architecture And Architectural Engineering. For these 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 adviser.

Information For Pre-Engineering 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 junior colleges. In general, two years of coursework will be transferable. However, there are small differences among the curricula so students electing this route should work closely with their advisers and KSU to ensure a proper selection of courses. Questions should be referred to the dean's office, College of Engineering.

BASIC PRE-ENGINEERING SUBJECTS

Use in Various Curricula - credit hours at KSU

	AgE	ArE	CE	ChE	CnS	EE	ET	IE	ME	NE
Accounting	*				3		*	3		
Biology	4			*						*
Chemistry	B	B	8	B	*	B	5	B	B	8
Computer Programming	2	3	*	1	3	3	2	2	2	*
Economics	3	*	3	3	3	3	*	3	3	3
English Composition	6	6	6	6	6	6	6	6	6	6
Geology			3	*	3					*
Graphics	2	6	2	*	6	2	2	2	5	*
Mathematics (An. Gm & Calc & Diff. Equa.)	16	16	16	16	5	16	5	16	16	16
Mathematics (Alg & Trig)							6			
Organic Chemistry				B						*
Physics	10	10	10	10	4	10	B	10	10	10
Qualitative Analysis			*	4						*
Social Science/Humanities Elective	15	12	14	15	12	15	15	15	15	15
Speech	2	2	2	2	2	2	2		2	
Statics	3	3	3	*	3	3	*	3	3	3
Statistics	*	*	*			*	3	6	*	

***Elective**

Excess credit hours in courses listed above may possibly be used in elective areas after consultation with a KSU departmental adviser and the dean's office.

Summer Session—Students transferring at the junior level may find it advantageous to attend the summer session preceding their fall enrollment. Engineering subjects that normally are offered include:

525 333—Statics
520 314—Introduction to Process Analysis
530 510—Circuit Theory I
550 372—Computers & Data Processing
550 501—Industrial Management I
560 512—Dynamics
560 513—Thermodynamics I
580 410—Introduction Nuclear Engineering

Engineering Honors Program

The honors program in the College of Engineering offers the interested student an intellectual challenge consistent with one's ability and interests. Entering engineering freshmen with high school averages or entrance examination 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.

The engineering college has approved the implementation of an experimental program encouraging the development of individual programs for students qualifying for the honors program. Such programs will be developed between an individual student and a faculty member of that student's department. Engineering faculty will be encouraged to seek out honor students and with them develop programs of study that will meet the student's academic and professional interests. The academic programs developed must be approved only by the student's department chairman and the engineering dean's office.

Participation in the honors program will not shorten the time required for graduation for most students, but should be a stimulating experience. In addition to enrolling in honors sections in course-work, the student may enroll in a variety of seminars, colloquia and research problems designed to enrich and challenge the interested student. 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. While one student is a full-time employee in industry, the other studies in his 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 his college expenses. Participants are selected from students who are progressing satisfactorily toward a degree and have completed at least one semester in their 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.

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.

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 Analytic Geometry and Caculus I are urged to investigate the possibility of summer school to remove this mathematics deficiency. College Algebra and Plane Trigonometry are offered during the summer sessions and provide an excellent transition from high school mathmatics into the engineering curriculum.

Information concerning the courses offered is contained in the summer school catalog, which may be obtained from the Director of Admissions of the University. The Summer School Catalog is published each February for the coming summer.

Departments and Course Offerings

AGRICULTURAL ENGINEERING

William H. Johnson, Head of Department*

Professors Chung,* Clark,* Fairbanks,* Hodges,* Holmes, Johnson,* Larson,* Lipper,* Manges,* and Wendling; Associate Professors Converse, Jepsen, Schindler, Spillman,* and Stevenson;* Assistant Professors Baugher, Hay, Kuhlman, Murphy, Powell, Rogers, TenEyck, and Thomas; Instructors Gartung and Scharplaz. Emeritus: Professor Fenton.

Agricultural Engineering is the profession that applies the science of engineering principles to the food production and agricultural industry. Basic training enables the student to develop new ideas and methods as well as to further the application of engineering fundamentals in such areas as production mechanization; soil, water, and air resources; power and energy sources; plant and animal environment; and feed and waste handling, processing, and storage.

The curriculum includes all basic courses such as mathematics, physics, chemistry, and mechanics common to engineering curricula, as well as specific courses in the field of agricultural engineering, some of which permit specialization in a particular area through technical electives available in the department.

Students completing this curriculum are prepared to do design, research, testing, sales promotion, teaching and extension work as applied to agriculture.

Federal and state agencies, colleges and universities, equipment manufacturers, rural electric power suppliers and many enterprises involving agriculture desire and need the services of the agricultural engineer.

Graduate Study

Major work leading to the Master of Science and Doctor of Philosophy degrees is offered in the fields of farm power and machinery, farm structures, soil and water engineering, rural electrification, animal waste management, and processing.

Excellent opportunities and capabilities exist for advanced study. In addition to modern departmental facilities, the U.S.D.A. Grain Marketing Research Center offers unique possibilities for specialization in the engineering of grain processing and handling systems.

Courses in Agricultural Engineering

Undergraduate Credit

505 160. Agricultural Engineering Concepts. (2) I. An introduction to agricultural engineering and engineering design. Problems involving the basic concepts of engineering science are considered. One lec. and two hours lab. a week. 505-160-1-0903

505 312. Biological Materials and Machine Functions in Agriculture. (3) II. Physical properties of biological materials. Functional requirements of agricultural machines. Two hours rec. and three hours lab. a week. Pr.: Phys. 213. 505-312-1-0903

Undergraduate And Graduate Credit In Minor Field

505 510. Environmental Design of Farm Buildings. (3) I. Fundamentals of psychrometrics, heat flow through walls, and air flow plus weather data and requirements of animals or stored products needed for environmental design of farm buildings. Two hours rec. and three hours lab. a week. Pr.: I.E. 372. Pr. or conc.: M.E. 513. 505-510-1-0903

505 520. Energy Use and Control in Agricultural Systems I. (3) II. Theory and application of energy conversion devices; measurement methods and instrumentation; fundamental concepts of hydraulic, electronic, and pneumatic control systems. Two hours rec. and three hours lab. a week. Pr.: M.E. 513. 505-520-1-0903

505 530. Soil and Water Engineering. (3) I. Principles and measures for controlling stormwater 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.: Ag.E. 551, M.E. 571, and C.E. 522 or Agron. 745. 505-530-1-0903

505 536. Design of Agricultural Machinery. (3) I. Analysis and design of agricultural machines. Two hours rec. and three hours lab. a week. Pr.: Phys. 214. Pr. or conc.: C.E. 533, Ag.E. 312. 505-536-1-0903

505 551. Hydrology. (2) I, II. A study of the sources of supply and movement of underground and surface waters. Two hours rec. a week. Pr. or conc.: Phys. 214. (Cross listed with C.E. 551.) 505-551-0-0903

505 566. Analysis of Agricultural Structures. (3) II. Estimation of loads on agricultural structures; allowable unit stresses; structural systems in agricultural buildings. Three hours rec. a week. Pr.: C.E. 533. 505-566-0-0903

505 570. Energy Use and Control in Agricultural Systems II. (3) II. Application of energy to condition and process biological materials important to agriculture; to modify their environments; and to measure, modify, or induce certain characteristics. Two hours rec. and three hours lab. a week. Pr.: Ag.E. 520. and E.E. 510 or E.E. 519. 505-570-1-0903

505 581. Professional Practice in Agricultural Engineering. (1) II. Professional attitudes and ethics. Post-degree career planning and social responsibilities. One hour rec. a week. Pr.: Senior standing. 505-581-0-0903

Undergraduate And Graduate Credit

505 620. 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. 505-620-3-0903

505 650. 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.: Ag.E. 536, Ag.E. 566. 505-650-1-0903

505 700. Agricultural Process Engineering. (3) I. Theory, equipment, and design techniques in processing agricultural products. Two hours rec. and three hours lab. a week. Pr.: M.E. 571, M.E. 513. 505-700-1-0903

505 705. Irrigation and Drainage. (3) I, II. Design and operative problems involved in irrigation or drainage of agricultural land. Two hours rec. and three hours lab. a week. Pr.: Ag.E. 551, M.E. 571 and C.E. 522 or Agron. 745. 505-705-1-0903

505 710. 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.: Ag.E. 536. 505-710-1-0903

505 780. Measurement Systems. (3) I. 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.: E.E. 510 or E.E. 519. 505-780-1-0903

Graduate Credit

505 810. 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. 505-810-4-0903

505 815. 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. 505-815-0-0903

505 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. 505-898-3-0903

505 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. 505-899-4-0903

505 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. 505-999-4-0903

Courses for Students in Agriculture

See page 57 for "Agricultural Engineering Courses for Students in Agriculture."

ARCHITECTURAL ENGINEERING/ CONSTRUCTION SCIENCE

I. Eugene Thorson, Head of Department

Professor Thorson;* Associate Professors Bissey* and Blackman; Assistant Professors Burton,* Goddard, and Dahl. Instructor Goodman.

The Architectural Engineering Program is planned for the student who is particularly interested in the engineering aspects of building design. The student receives thorough instruction in mathematics and engineering science, as well as course work in architectural design, materials, graphics and building systems. The student applies these principles to structural, mechanical, electrical and acoustic requirements of building design. The architectural engineer must be sympathetic with the practical, functional and aesthetic possibilities of contemporary materials, and 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 for the total design.

The Construction Science program of study has as its goal the training of construction managers. Students will take courses in math, engineering science, materials, business and management. The program prepares the graduate to execute the designs created by engineers and architects. The graduate enters the construction field in areas generally categorized as: *Building Construction*—in this category are homes, apartments, office buildings, industrial plants, hospitals, churches, schools, etc.; *Highway Construction*—dams, tunnels, flood control projects, etc.; and *Utilities Construction*—sanitary works, water works, power lines, pipe lines, etc. Career opportunities include positions as project managers, general superintendents, estimators, field engineers, expeditors, cost engineers, etc. Eventual company ownership will be a possibility for some.

Courses in Architectural Engineering

Undergraduate Credit

510 020. 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. per month. 510-020-0-0904.

510 100. Architectural Engineering Orientation. (2) II. Introduction to Architectural Engineering; emphasis on relationship of Architectural Engineering to the building industry. Two hours lec. a week. 510-300-0-0904.

510 411. Architectural Engineering Design I. (3) I. Principles and elements of design; synthesis of structural, mechanical, electrical, sanitary and construction; considering interrelationship in performance and economics. Nine hours lab. a week. Pr.: P.D.P. 261. 510-411-1-0904

510 412. Architectural Engineering Design II. (3) II. Continuation of Architectural Design I. Nine hours lab. a week. Pr.: Ar.E. 411. 510-412-1-0904

Undergraduate Credit And Graduate Credit In Minor Field

510 522. 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.: C.E. 331. 510-522-1-0904

510 523. Timber Structures. (3) I, II. Analysis and design of timber structures using solid and laminated materials. Three hours rec. per week. Pr.: C.E. 331 or C.E. 533. Pr. or conc.: Arch. E. 522 or C.E. 537. 510-523-0-0904

510 524. Theory of Structures II. (4) I, II. Analysis and design of metal structures; emphasis on buildings. Six hours per week. Pr.: Arch. E. 522 or C.E. 537 and Arch. E. 523. 510-524-1-0904

510 528. Theory of Structures III. (4) I, II, S. Design of reinforced concrete building frames; footings, columns and floor systems, attention being given to costs and economical design. Six hours per week. Pr.: Arch. E. 522 or C.E. 537. 510-528-1-0904

510 534. Thermal Systems. (3) I, II. 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 design. Three hours per week. Pr.: Phys. 113 or 213. 510-534-0-0904

510 535. Lighting Systems. (3) I, II. Vision, human psychophysical and psychological response, color, natural and artificial lighting design and light sources, lighting techniques and spatial relationships, as integral parts of architectural design. Three hours per week. Pr.: Phys. 113 or 213. 510-535-0-0904

510 536. 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 per week. Pr.: Gen. Phys. 113, or Phys. 213. 510-536-0-0904

510 537. Acoustic Systems. (2) I, II. Hearing and the ear, sound generation, acoustical correction, noise reduction, sound transmission all as integral parts of architectural design. Two hours a week. Pr.: Phys. 113, or Phys. 213. 510-537-0-0904

510 538. 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.: Junior Standing. 510-538-3-0904

Undergraduate And Graduate Credit

510 634. Building Thermal System Design. (3) I, II. Design and specifications of selected thermal and mechanical systems for structures. The course is designed to utilize all the modern techniques of thermal/mechanical system design for buildings. Two hours rec. and three hours lab. a week. Pr.: Ar.E. 534. 510-634-1-0904

510 635. Electrical System Design. (3) I, II. Complete design and specifications of electrical systems for a selected structure. The course is designed to utilize 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.: Ar.E. 535. 510-635-1-0904

510 638. 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.: Ar.E. 634, Ar.E. 635. 510-638-1-0904

510 780. Theory of Structures IV. (3) II. Cont. of Theory I, II, and III, with special emphasis being placed on the complete problem of the structure as a whole. Three hours a week. Pr.: C.E. 537 or Arch. E. 522, 523, 524, and 528. 510-780-0-0904

Graduate Credit

510 885. 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.: Arch. E. 780. 510-885-1-0904

Courses in Construction Science

Undergraduate Credit

515 016. 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. per month. 515-016-0-0904

515 210. Introduction to Construction Programming. (3) I, II. Application of digital computer techniques to the solution of elementary problems in the field of Construction Science and Architecture. Pr.: Math. 150. Four hours per week. 515-210-0-0904

515 250. 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.: Arch. Pre-Pro. 211, Con. Sci. 210, C.E. 212. Four hours per week. 515-250-1-0904

515 320. Construction Materials. (2) I, II. Study and analysis of construction materials, their properties, selection and use. Two hours rec. a week. Pr.: P.D.P. 211 and-conc.: Cn.S. 321. 515-320-0-0904

515 321. 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.: P.D.P. 211. 515-321-1-0904

515 325. 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.: Cn.S. 321, Cn.S. 250. 515-325-1-0904

515 410 and 515 411. Structures I "A" and II "A". Theory and applied structural analysis, design and planning; structural building systems of wood, steel and concrete. Six hours lec. and rec. per week.

515 410. S.I "A". I. Pr.: Arch. Pre-Pro. 291. 515-410-1-0904

515 411. S.II "A". (3) II. Pr.: Con. Sci. 410. 515-411-1-0904

Undergraduate Credit And Graduate Credit In Minor Field

515 540. Construction Problems I. (3) I, II. Practical problems encountered in the erection of buildings and use of construction equipment. Pr.: Con. Sci. 250 and 325. 515-540-0-0904

515 541. Construction Estimating. (3) I, II. Principles, theories and methods of building estimating. Nine hours lab. a week. Pr.: Con. Sci. 325 and 540. 515-541-1-0904

515 542. Construction Management I. (3) I, II. General business and management procedures of construction contracting; human relations and communications. Pr. or conc.: Con. Sci. 541. 515-542-0-0904

515 543. Construction Management II. (3) I, II. Construction safety; project planning and scheduling techniques. Computer applications. Pr.: Con. Sci. 210, 541, and 542. 515-543-0-0904

515 544. 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. 515-544-3-0904

CHEMICAL ENGINEERING

L.T. Fan, Head of Department*

Professors Akins,* Bates,* Erickson,* Fan,* Honstead,* and Kyle;* Associate Professors Matthews,* Roth,* Walwender,* and Woodard; Assistant Professors Akinc, Hall,* and Lai.*

Chemical engineers contribute to society through the useful application of knowledge and understanding of chemistry, physics, and mathematics. They devise and develop new products, design new processes, improve and manage existing manufacturing processes, sell chemical products and processing equipment, and provide liaison between industry and the consumer.

Employment opportunities exist in the chemical, petroleum, pharmaceutical, plastics, paper, and food processing industries, as well as in government service. Chemical engineers can expect to participate in many decisions crucial to the preservation and improvement of society, especially in the areas of energy and food production, resource management, and the specification and design of pollution control processes.

The chemical engineering curriculum is designed to give students the necessary breadth and depth of knowledge and scientific tools to perform these functions. It is also intended that the program be flexible enough to accommodate a broad range of educational interests. Sufficient electives have been provided so a student can emphasize areas such as chemistry, mathematics, material science, management, computer science, and bioengineering. The curriculum also is well suited as a pre-law or premedicine program.

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 K-State, 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 K-State 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.

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, optimization techniques,

and process development is under way, 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 repaired. A glass blower is available on the campus, and the College of Engineering and the University computing centers are used extensively by graduate students.

Integrated Master's Degree Program

A five-year integrated program leading to a B.S. in chemical engineering at the end of four years and a Master of Science in chemical engineering at the end of five years is available for promising undergraduate students. 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 adviser, 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.

Courses in Chemical Engineering

Undergraduate Credit

520 015. Engineering Assembly. 520-015-0-0906

520 314. Introduction to Process Analysis. (3) I, II, S. An introduction to the basic concepts of chemical engineering. Three hours rec. a week. Pr.: Chem. 230; Pr. or conc.: Math. 222 and Phys. 214. 520-314-0-0906

520 316. Chemical Engineering Computational Techniques. (1) I, II, S. Application of digital and analog computers, graphical methods, and statistics to chemical engineering problems. Three hours lab. a week. Pr. or conc.: Ch.E. 314 and Math. 240. 520-316-1-0906

520 350. Engineering Materials. (2) I, II. Engineering requirements of materials; arrangements of atoms in materials; metallic and ceramic phases and their properties; polymers; multiphase equilibrium and non-equilibrium relationships; modification of properties through changes in microstructure; stability under service stresses, thermal behavior in service; corrosion; behavior in electromagnetic fields; effects of radiation on materials. Two hours rec. a week. Pr.: Chem. 230. Pr. or conc.: Phys. 213. 520-350-0-0913

520 351. Engineering Materials Laboratory. (1) I, II. Laboratory experiments supplementing Ch.E. 350. Pr. or conc.: Ch. E. 350. 520-351-1-0913

Undergraduate And Graduate Credit In Minor Field

520 520. Ch.E. Thermodynamics I. (2) I. 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.: Ch.E. 314 and Chem. 585. 520-520-0-0906

520 521. 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.: Ch.E. 520. 520-521-0-0906

520 522. Chemical Engineering Laboratory I. (2) I, II. Principles and techniques of physical measurements such as temperature, pressure and concentration; basic principles of momentum transfer, heat transfer, and mass transfer; experiments in classical unit operations, e.g., distillation, evaporation, drying, fluidization, and in chemical kinetics, thermodynamics and process dynamics. Five hours lab. a week. Pr.: Ch.E. 520. Pr. or conc.: Ch.E. 530. 520-522-1-0906

520 530. 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.: Ch.E 314. 520-530-0-0906

520 531. Transport Phenomena II. (3) II. Cont. of Transport Phenomena I with special emphasis on mass transfer. Three hours rec. a week. Pr.: Ch.E. 530. 520-531-0-0906

520 532. Chemical Engineering Laboratory II. (2) I, II. Cont. of Chemical Engineering Laboratory I. Five hours lab. a week. Pr.: Ch.E. 522. 520-532-1-0906

520 542. Chemical Engineering Laboratory III. (2) II. Cont. of Chemical Engineering Laboratory II. Five hours lab. a week. Pr.: Ch.E. 532. 520-542-1-0906

520 550. 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.: Ch.E. 521 and Ch.E. 531. 520-550-0-0906

520 560. Separational Process Design. (2) I. Development of the basic theory and design of separational processes such as distillation, gas absorption, liquid extraction, adsorption and ion exchange. Two hours rec. a week. Pr.: Ch.E. 521 and Ch.E. 531. 520-560-0-0906

520 561. Chemical Process Dynamics & Control. (3) II. A study of the unsteady state behavior of chemical processes, modeling and simulation of chemical processes, classical control theory and design. Two hours rec. and three hours lab. a week. Pr.: Ch.E. 550. 520-561-1-0906

520 570. Ch.E. Systems Design I. (3) I. Basic concepts of optimization and process economics with application to the design of chemical processes. Two hours rec. and three hours lab. a week. Pr. or conc.: Ch.E. 550 and Ch.E. 560. 520-570-1-0906

520 571. Ch.E. Systems Design II. (3) II. The synthesis and design of chemical processing systems. Emphasis will be placed on the solution of comprehensive systems design problems. One hour rec. and six hours lab. a week. Pr.: Ch.E. 570. 520-571-1-0906

520 580. Problems in Chemical Engineering. (Var.) I, II, S. An introduction to chemical engineering research. Pr.: Approval of department head. 520-580-4-0906

Undergraduate And Graduate Credit

520 655. Metal Casting. (3) II. An advanced course in the materials and metals used in modern metal casting processes. Application of metallurgical principles in the study of cast metals. Two hours rec. and three hours lab. a week. Pr.: I.E. 241 and Ch.E. 350. 520-655-1-0913

520 660. Material Imperfections. (3) II. The nature of a crystal and the structures of materials; X-ray methods involved in the study of materials; preferred orientation and fiber textures; defects in crystals; phase transformation in the solid state; the effects of physical treatments on the crystal lattice of metals; defects in crystals. Two hours rec. and three hours lab, a week. Pr.: Phys. 241, Ch.E. 350. 520-660-1-0913

520 661. Industrial Metallurgy. (3) II. The physical behavior of metals while undergoing various industrial fabrication processes; responses involving plastic flow, allotropic transformation, recrystallization, grain growth, diffusion, mechanical and crystallographic fibering, solid-state solution and precipitation. Two hours rec. and three hours lab. a week. Pr.: I.E. 241, Ch.E. 351. 520-661-1-0913

520 663. Internal Structures of Metals. (2) I. Studies of internal structural phenomena of ferrous and non-ferrous alloys using metallographic and microphysical analyses. One hour rec. and three hours lab. a week. Pr.: Ch.E. 351. 520-663-1-0913

520 664. Electrochemical Behavior of Metals. (3) I. The electrochemical processes involved in corrosion of metals and the basic factors determining the nature and rate of attack; consideration of corrosion problems and methods of combating corrosion. Two hours rec. and three hours lab. a week. Pr.: Chem. 230, Phys. 213. 520-664-1-0913

520 671. Structure of Engineering Materials. (2) I. The physical theories of the structure of solids; binding forces in molecular and crystalline materials; crystallography; thermodynamic stability of matter; equilibrium diagrams and The Phase Rule; rate theory and kinetics of solid-state transformations. Two hours rec. a week. Pr.: Ch.E. 351. 520-671-0-0913

520 672. Mechanical Behavior of Engineering Materials. (2) II. The theoretical consideration of the mechanical behavior of solids; stress and strain; elastic and plastic deformation; dislocations; strength of solid materials; recovery, creep and flow; fracture mechanisms. Two hours rec. a week. Pr.: Ch.E. 671. 520-672-0-0913

520 715. 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.: Ch.E. 550. 520-715-0-0906

520 725. 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.: Ch.E. 530. 520-725-0-0906

520 735. 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.: Ch.E. 530. 520-735-0-0906

520 745. 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.: Ch.E. 550. 520-745-0-0906

520 762. Advanced Metallurgy. (Var.) II. Studies in specialized phases and current concepts of metallurgy. Pr.: Ch.E. 351. 550-762-3-0913

520 766. Powder Metallurgy. (3) II. Production of powders by mechanical and chemical methods; theoretical concepts associated with consolidation, heat treating and internal structural changes of parts produced from powder metals and cermets. Two hours rec. and three hours lab. a week. Pr.: Ch.E. 663. 520-766-1-0913

520 795. Separation of Nuclear Fuels. (4) II. A graduate level course investigating the chemical properties, the methods of separation, purification and reprocessing of uranium, thorium and plutonium. Three hours rec. and three hours lab. a week. Pr.: N.E. 613 or Ch.E. 560 (Cross-listed with Nuclear Engineering 580 795). 520-795-1-0906

Graduate Credit

520 805. 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.: Ch.E. 715. 520-805-0-0906

520 810. 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. 520-810-4-0906

520 815. 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. 520-815-0-0906

520 822. Advanced Chemical Reaction Engineering. (3) I, II, S. Theory of kinetics and catalysis in homogenous and heterogeneous systems, with applications in chemical reactor design and process development. Three hours rec. a week. Pr.: Ch.E. 550. 520-822-0-0906

520 826. Advanced Unit Operations I. (3) I, II, S. Advanced study of mass transfer operations. Three hours rec. a week. Pr.: Ch.E. 560. 520-826-0-0906

520 832. Advanced Unit Operations I. (3) I, II, S. Advanced study of the operations involving mechanical separation of materials. Three hours rec. a week. Pr.: Ch.E. 560. 520-832-0-0906

520 850. 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. 520-850-0-0906

520 855. Chemical Engineering Analysis II. (3) I, II, S. Cont. of Ch. E. 735. Mathematical and statistical methods applied to chemical engineering problems. Three hours rec. a week. Pr.: Ch.E. 735. 520-855-0-0906

520 862. 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.: Ch.E. 735. 520-862-0-0906

520 867. 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.: Ch.E. 862. 520-867-0-0906

520 871. 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.: Ch.E. 571, Ch.E. 735. 520-871-0-0906

520 875. Graduate Seminar in Chemical Engineering. (1) I, II. Discussion of current advances and research in chemical engineering and related fields. 520-875-0-0906

520 898. Master's Report. (Var.) I, II, S. Topics selected with approval of department head and major professor. 520-898-4-0906

520 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of department head and major professor. 520-899-4-0906

520 901. 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.: Ch.E. 822 and one course in chemical engineering numbered 851 or higher. 520-901-0-0906

520 910. Selected Topics in Transport Phenomena. (3) I, II, S. Subjects of current interest such as surface phenomena, turbulent transport, droplet mechanics, multi-component systems. Three hours rec. a week. Pr.: Ch.E. 867. 520-910-0-0906

520 915. 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 Lyupanov theorems and the maximum principle are examples of the methods to be studied. Three hours rec. a week. Pr.: Ch.E. 850 and one graduate course in chemical engineering numbered 851 or higher. 520-915-0-0906

520 920. 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.: Ch.E. 826 or Ch.E. 832 and one course in chemical engineering numbered 851 or higher. 520-920-0-0906

520 925. 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.: Ch.E. 871. 520-925-0-0906

520 930. 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.: Ch.E. 815 and one course in chemical engineering numbered 851 or higher. 520-930-0-0906

520 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of department head and major professor. 520-999-4-0906

CIVIL ENGINEERING

Robert R. Snell, Head of Department*

Professors Best,* Cooper,* Rosebraugh,* Smith,* Snell,* Swartz,* and Williams;* Associate Professors Hu,* Knostman,* Lindly,* Russell,* and Schmid;* Assistant Professors Crary, Hayden, Musterman,* and Zovne.* Emeritus: Professors Crawford, McCormick,* Morse, Munger, and Taylor.

The civil engineer designs and constructs: structures, including buildings, bridges, tunnels, towers, air frames and space vehicles; transportation facilities, including highways, airports, waterways, railways and pipelines; water supply facilities, including treatment plants and distribution systems; waste disposal facilities, including treatment plants and collector systems; water resource facilities, including dams, canals and reservoirs; flood control facilities, including levees, dikes, retention basins and bank protection. The objectives of the curriculum in civil engineering are to prepare the student for participation in, and ultimately to assume responsibility for, the planning, analysis, location, design and construction of the above-named types of civil engineering works.

Graduate Study

Major work leading to the Master of Science and Doctor of Philosophy degree 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.

Courses in Civil Engineering

Undergraduate Credit

525 015. Engineering Assembly. (0) I, II. 525-015-0-0908

525 212. 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. 525-212-1-0908

525 231. 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. 210 or Math. 220. 525-231-0-0999

525 322. 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. 525-322-0-0908

525 331. 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.: C.E. 231. 525-331-0-0999

525 332. Strength of Materials A Laboratory. (1) I, II. Tests to determine the physical properties of various structural materials, including steel, aluminum, wood, and concrete. Analysis and interpretation of test data. Three hours lab. a week. Pr. or conc.: C.E. 331. 525-332-1-0999

525 333. 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. or conc.: Math. 221. 525-333-0-0999

525 411. 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. per week. Pr.: C.E. 212. 525-411-1-0908

Undergraduate And Graduate Credit In Minor Field

525 511. Photogrammetry. (3) I, II. Principles of terrestrial and aerial photogrammetry; theory and use of stereoplotters; construction of mosaics, flight maps, and planimetric maps. Two hours rec. and three hours lab. a week. Pr.: C.E. 212. Pr. or conc.: C.E. 411. 525-511-1-0908

525 522. 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.: C.E. 533. 525-522-1-0908

525 528. Foundation Engineering. (3) I, II. Prediction of soil variation; soil investigations; stress distribution and bearing capacity; dewatering analysis and procedures; retaining structures and lateral earth pressure; shallow foundations, pile foundations; underpinning and grouting. Two hours rec. and three hours lab. a week. Pr.: C.E. 522. Pr. or conc.: C.E. 544. 525-528-1-0908

525 530. Statics and Dynamics. (4) I, II, S. 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. 525-530-0-0999

525 533. Mechanics of Materials. (3) I, II, S. 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.: C.E. 333. Pr. or conc: Math. 222. 525-533-0-0999

525 534. Mechanics of Materials Laboratory. (1) I, II, S. 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.: C.E. 533. 525-534-1-0999

525 537. Introduction to Structural Analysis. (4) I, II. Elastic analysis of beams, frames and trusses; calculation of influence lines and deflections; introduction to the displacement method using matrix algebra. Four hours rec. a week. Pr.: C.E. 533. 525-537-0-0908

525 542. Structural Engineering in Steel. (3) I, II, S. 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.: C.E. 537. 525-542-1-0908

525 544. Structural Engineering in Concrete. (3) I, II, S. 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. or conc.: C.E. 537. 525-544-1-0908

525 551. 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. 214. (Cross listed with Ag. E. 551.) 525-551-0-0908

525 552. Hydraulic Engineering. (3) I, II. Applications of the principles of fluid mechanics to control and utilization 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.: M.E. 571. Pr. or conc.: C.E. 551. 525-552-1-0908

525 553. Hydrologic Methods Laboratory. (1) I. Application of hydrologic methods in design; precipitation data analysis; evapotranspiration; streamgaging; 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.: C.E. 551. 525-553-1-0908

525 563. Sanitary Engineering Fundamentals. (3) I, II. Basic concepts from chemistry and microbiology and their applications to the determination and control of water quality and to the techniques employed in biological waste treatment. Two hours rec. and three hours lab. a week. Pr.: Chem. 230. 525-563-1-0908

525 565. Sanitary Engineering Design. (3) I, 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.: C.E. 552 and C.E. 563. 525-565-1-0908

525 571. Transportation Engineering. (3) I, II. The development, economic feasibility, method of financing, location, geometric design, and operational analysis of transportation systems. Two hours rec. and three hours lab. a week. Pr.: C.E. 411 and junior standing. 525-571-1-0908

525 585. Civil Engineering Project. (1-3) I, II. A laboratory design or research problem selected by the student. Requires a review of the literature; the preparation of a proposal which describes the project; the completion of the design or research; and the preparation of a report. Maximum cr. hrs.: 3. May be substituted for a required senior design course on recommendation of instructor and approval of the department head. 525-585-2-0908

Undergraduate And Graduate Credit

525 641. 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 3 hours lab. a week. Pr.: C.E. 534. 525-641-1-0908

525 680. Economics of Design and Construction. (3) I. 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 non-engineering majors. 525-680-0-0908

525 718. Engineering Photo Interpretation. (3) I. 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. 525-718-1-0908

525 722. 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.: C.E. 522. 525-722-0-0908

525 724. 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.: C.E. 522. 525-724-1-0908

525 728. 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.: C.E. 544 and C.E. 528. 525-728-1-0908

525 730. 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.: C.E. 533, Math. 240. 525-730-0-0999

525 731. Experimental Stress Analysis. (3) I. Experimental methods of investigating stress distributions. Photoelastic models, photoelastic coatings, brittle coatings, and resistance strain gages applied to static and dynamic problems. Two hours rec. and three hours lab. a week. Pr. or conc.: C.E. 533. 525-731-1-0999

525 732. 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.: C.E. 537. 525-732-0-0908

525 733. 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.: C.E. 537. 525-733-0-0908

525 734. Experimental Techniques in Mechanics. (1-3) I, II. Techniques and instrumentation for the experimental analysis of selected problems in vibrations, dynamics, fluid mechanics or engineering materials. Pr.: Senior standing in engineering and consent of instructor. 525-734-2-0999

525 735. Numerical Solutions in Structural Mechanics. (3) I, in alt. 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.: C.E. 537. 525-735-0-0908

525 736. Energy Methods in Engineering Mechanics. (3) II. 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.: C.E. 533. 525-736-0-0999

525 737. Elastic Stability. (3) II. 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.: C.E. 533, Math. 240. 525-737-0-0999

525 742. 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.: C.E. 542. 525-742-0-0908

525 743. Advanced Reinforced Concrete Theory. (3) II. Advanced theories and methods of design and analysis of reinforced concrete structures. Three hours rec. a week. Pr.: C.E. 544. 525-743-0-0908

525 744. 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.: C.E. 544. 525-744-0-0908

525 751. 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.: C.E. 552. 525-751-0-0908

525 752. Advanced Hydrology. (3) II. Review 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.: C.E. 551. 525-752-0-0908

525 761. Sanitary Engineering Chemistry. (3) I. Application of basic concepts of chemical equilibria, physical chemistry, organic chemistry and biochemistry to the field of sanitary engineering. Senior standing or consent of instructor. Three hours rec. a week. Pr.: C.E. 563. 525-761-0-0908

525 762. Water Treatment Systems. (3) II. An in-depth study of the basic physical, chemical, and biological factors and their application in the design of water supply and water quality control systems. Three hours rec. a week. Pr.: C.E. 565. 525-762-0-0908

525 766. Wastewater Treatment Systems I. (3) I. A study of wastewater treatment systems applied to domestic and industrial wastewaters. Emphasis is placed on the basic biological concepts applicable to the design of conventional wastewater treatment systems. Three hours rec. a week. Pr.: C.E. 565. 525-766-0-0908

525 767. Wastewater Treatment Systems II. (3) II. A study of advanced wastewater treatment systems including nutrient, suspended solids, and trace organic removals, along with treatment and disposal of the resultant solids. Emphasis is placed on synthesis of the various processes into the total treatment scheme. Pr.: C.E. 766 or consent of instructor. 525-767-0-0908

525 770. Geometric Design of Highways. (3) II. Criteria controlling geometric design of highways, vehicle requirements, speed volume, capacity of safe grades, alignment, and cross-section; intersections and interchanges. Two hours rec. and three hours lab. a week. Pr: C.E. 571. 525-770-1-0908

525 771. Urban Transportation Analysis I. (3) I. 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.: C.E. 571 or consent of instructor. 525-771-1-0908

525 773. Airport Design. (3) I. On demand. Problems encountered in planning, design, construction, and maintenance of large airports. Two hours rec. and three hours lab. a week. Pr.: C.E. 571. 525-773-1-0908

525 774. Pavement Design. (3) II. On 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.: C.E. 522. 525-774-1-0908

525 775. Traffic Engineering I. (3) I. 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.: C.E. 571 or consent of instructor. 525-775-1-0908

525 786. 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 easements. Two hours rec. and three hours lab. a week. Pr.: Senior standing in engineering or graduate standing in regional and community planning. 525-786-1-0908

525 790. Problems in Civil Engineering. (Var.) I, II, S. Pr.: Approval of instructor. 525-790-3-0908

Graduate Credit

525 810. 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. 525-810-3-0908

525 822. 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.: C.E. 722. 525-822-1-0908

525 823. 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.: C.E. 722. 525-823-1-0908

525 826. Engineering Properties of Cohesionless and Mixed Soils. (3) II. Mineralogy and physical characteristics; fabric and bonding in mixed soils; compressibility and strength characteristics; moisture effects, retention, and movement. Two hours rec. and three hours lab. a week. Pr. or conc.: C.E. 724. 525-826-1-0908

525 831. Advanced Structural Theory. (3) I. On demand. Current and developing topics in advanced structural theory. Three hours rec. a week. Pr.: Approval of instructor. 525-831-0-0908

525 835. Structural Dynamics. (3) I. Analysis of structures subjected to dynamic loading. Three hours rec. a week. Pr.: C.E. 735. 525-835-0-0908

525 838. Theory of Plates and Shells. (3) I, in alt. 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.: C.E. 730. 525-838-0-0999

525 845. Analysis and Design of Folded Plate Structures. (3) II. Theoretical foundation of folded plate analysis; bending theory for prismatic folded plate structures; matrix formulation; folded plates with non-symmetric loading; continuous folded plate structures; prismatoidal and triangular plate structures. Three hours rec. a week. Pr. C.E. 732, C.E. 730. 525-845-0-0908

525 848. Advanced Structural Design. (3) II. On demand. The design of complex steel and/or reinforced concrete structures; individual projects. Three hours rec. a week. Pr.: C.E. 732, minimum of nine hours graduate credit in structures and approval of instructor. 525-848-0-0908

525 849. Design of Shell Structures. (3) II, in alt. 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.: C.E. 838. 525-849-0-0908

525 851. Hydraulics of Open Channels II. (3) II. Spatially varied flow; flow in channels of non-prismatic cross-section and nonlinear alignment (transitions); unsteady free-surface flow; flood routing; numerical simulation of unsteady open-channel flow. Three hours rec. a week. Pr.: C.E. 751. 525-851-0-0908

525 854. 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.: C.E. 552. 525-854-0-0908

525 863. Advanced Topics in Sanitary Engineering. (1-3) On demand. For graduate students in sanitary engineering. The course provides a forum for the discussion of advanced topics in sanitary engineering. Research being conducted at this and other institutions is analyzed critically. 525-863-0-0908

525 871. Urban Transportation Analysis II. (3) II. Trip forecasting, trip generation, trip distribution and trip assignment; accuracy checks; planning parking facilities; study of models used in transportation planning; transportation systems and plans evaluation. Two hours rec. and three hours lab. a week. Pr.: C.E. 771. 525-871-1-0908

525 875. 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.: C.E. 775. Pr. or conc.: Stat. 510. 525-875-1-0908

525 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. 525-898-4-0908

525 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. 525-899-4-0908

525 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. 525-999-4-0908

ELECTRICAL ENGINEERING

*Everett E. Haft, *Acting Head of Department*

Professors Ahmed,* Casey,* Haft,* Koepsel,* Lucas,* Rathbone,* and Ward, Jr.;* Associate Professors Gallagher,* Harris,* Hummels,* Johnson,* and Lenhert;* Assistant Professor Cottom;* Instructors Hearn and Wakabayashi. Emeritus: Professors Hunt, Kerchner, and Sitz.

The program of study in electrical engineering prepares a student for a career in research, development, design, operation and plant engineering, manufacturing, technical sales and application engineering in the profession of electrical engineering. Fields of employment are in areas such as microelectronics and integrated circuits, communication systems, automatic control, digital computers, energy systems, lasers, microwave devices and systems, bioengineering and solid state devices. An individual, upon completing the program of study, will find employment opportunities with industrial organizations, the government, utilities, consulting firms and educational institutions. Opportunities also exist for baccalaureate degree holders to enter such fields as medicine, law and business administration.

The first two years of the curriculum are mathematics and physical sciences oriented while the third year emphasizes analysis and the fundamental concepts of electrical engineering. The fourth and final year broadens the student's understanding of engineering and is an introduction to various aspects of electrical engineering design. Humanities and social science electives are available for the student as well as technical electives. The latter are usually chosen from such fields as communication systems, solid state engineering, integrated circuits, control systems, radar, power systems, energy conversion, computer systems and microwaves.

Graduate Study

Major work is offered in programs of study leading to the Master of Science and Doctor of Philosophy degrees with areas of specialization in circuit theory, electromagnetic theory, bioengineering, information and communication systems, solid state engineering and integrated circuit technology, control systems, electric energy systems, and computer engineering.

Special facilities available for graduate research include a solid state and thin film technology laboratory, and a computer and signal processing laboratory. The former is equipped with a clean room, vacuum equipment, photographic reduction equipment, clean air benches, diffusion furnaces, and other specialized equipment for use in microelectronics. The computer facilities within the department contain both minicomputer and microprocessor equipment. The University Computing Center IBM System 370 Model 158 computer and supporting services are available for graduate instruction and research.

Other facilities within the department which support the areas of specialization include a bioengineering research laboratory, a communication circuits design laboratory, an electric

energy systems laboratory, and a simulation and systems laboratory.

Prerequisite to graduate study in the department is the completion of a program of study substantially equivalent to that required of undergraduate students in electrical engineering at this institution.

Courses in Electrical Engineering

Undergraduate Credit

530 241. Introduction to Computer Engineering. (3) I, II. 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.: Comp. Sci. 200. 530-241-0-0909

Undergraduate And Graduate Credit In Minor Field

530 501. 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. or conc.: E.E. 511, E.E. 525, E.E. 557. 530-501-1-0909

530 502. Electrical Engineering Laboratory II. (2) I, II. Cont. of Electrical Engineering Laboratory I. Three hours lab. a week. Pr.: E.E. 501; Pr. or conc.: E.E. 526, E.E. 581. 530-502-1-0909

530 510. 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. or conc.: Math. 240, Phys. 214. 530-510-0-0909

530 511. Circuit Theory II. (4) I, II, S. Analysis of electric circuits using transform techniques. Four hours rec. a week. Pr.: Math. 240, E.E. 510. 530-511-1-0909

530 519. 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. Pr.: Phys. 214. 530-519-0-0909

530 525. Electronics I. (3) I, II, S. Fundamentals of electronic components, devices, and circuits. Three hours rec. a week. Pr.: E.E. 510 or E.E. 519 or E.T. 530. 530-525-0-0909

530 526. Electronics II. (3) I, II, S. Continuation of Electronics I. Three hours rec. a week. Pr.: E.E. 511, E.E. 525. 530-526-0-0909

530 530. Control Systems Design. (3) I, II. Modeling, analysis, and design of control systems. Three hours rec. a week. Pr.: Senior standing. 530-530-0-0909

530 557. 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, Math. 240. Pr. or conc.: E.E. 510. 530-557-0-0909

530 581. 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.: E.E. 511 and E.E. 557. 530-581-0-0909

530 589. 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. Pr.: E.E. 519. 530-589-1-0909

530 590. Electrical Engineering Seminar. (1) I, II. Preparation and oral presentation of a written technical report. One hour rec. a week. Pr.: Senior standing in electrical engineering. 530-590-0-0909

Undergraduate And Graduate Credit

530 603. 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.: E.E. 502. 530-603-1-0909

530 625. Integrated Circuits Engineering. (3) I, 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. 530-625-1-0909

530 627. Communication Electronics. (3) I, II. An introduction to analog communication systems. Includes amplitude modulation (AM) and frequency modulation (FM) by analog signals and the determination signal-to-noise ratio in AM and FM systems. Design of simple oscillators, modulators, mixers, and detectors. Three hours rec. a week. Pr.: E.E. 526. 530-627-0-0909

530 628. 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.: E.E. 526. 530-628-0-0909

530 641. Design of Digital Systems I. (3) II. Design considerations pertaining to computer organization, data representation, data flow circuits, storage organization, and input-output processes. Three hours rec. a week. Pr.: E.E. 241. 530-641-0-0909

530 642. Design of Digital Systems II. (3) I. 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.: E.E. 645 and E.E. 641. 530-642-1-0909

530 643. Computer Logic Laboratory. (1) II. Laboratory experience in the design, construction and debugging of simple digital systems and subsystems. Three hours lab. a week. Pr. or conc.: E.E. 641. 530-643-1-0909

530 644. Digital Systems Design Laboratory. (1) I. Practical aspects of digital system design including threshold voltage levels, propagation delay, clock requirements and interfacing problems associated with logic systems and analogic devices. Three hours lab. a week. Pr. or conc.: E.E. 642. 530-644-1-0909

530 645. Digital Electronics. (3) I, II. The characteristics and performance of the major contemporary digital logic families. Three hours rec. a week. Pr.: E.E. 526. 530-645-0-0909

530 646. Fault Diagnosis in Digital Systems. (3) I, II. Hazards, fault detection in combinatorial circuits and sequential machines using path sensitizing and fault matrix methods, state table analysis, etc.; system reliability through logical redundance. Three hours rec. a week. Pr. or conc.: E.E. 641. 530-646-0-0909

530 647. Digital Network Theory. (3) I. Difference equation characterization of digital networks, transient and steady-state analysis of digital networks using the Z-transform, transfer function representation of digital filters, implementation of digital filters. Three hours rec. a week. Pr.: E.E. 511. 530-647-0-0909

530 648. Microcomputer Programming and Applications. (2) I, II. Application of microprocessor-based microcomputers in data processing instrumentation, control and communications. One hour lec. and three hours lab. a week. Pr.: E.E. 241 plus concurrent enrollment in C.S. 658. 530-648-1-0909

530 649. Analog Computation. (3) II. Analog computer solution and simulation of engineering problems. Two hours rec. and three hours lab. a week. Pr.: Math. 240 or equiv.; Phys. 114 or 214, E.E. 526. 530-649-1-0909

530 659. Wave Guides, Antennas and Propagation. (3) I, II. Applications of Maxwell's equations to boundary value problems, guided transmission, cavities, radiation and propagation. Three hours rec. a week. Pr.: E.E. 557. 530-659-0-0909

530 661. Digital Communication Systems. (3) I, 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.: E.E. 526. 530-661-0-0909

530 662. Design of Communication Circuits. (3) 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.: E.E. 526, E.E. 502. 530-662-0-0909

530 682. Energy Conversion II. (3) I, II. Continuation of 530 581. Three hours rec. a week. Pr.: E.E. 581. 530-682-0-0909

530 685. Electric Energy Systems Engineering I. (3) I. A comprehensive study of the network aspects of existing electric-energy systems in the steady state. Vector-matrix descriptions and computer solutions are emphasized. Three hours rec. a week. Pr.: E.E. 581. 530-685-0-0909

530 686. Electric Energy Systems Engineering II. (3) II. A comprehensive study of the systems control and operational aspects and the transient behavior of existing electric energy systems. Vector-matrix description and computer solutions are emphasized. Three hours rec. a week. Pr.: E.E. 530 and E.E. 685. 530-686-0-0909

530 688. Power System Stability. (3) II. The analysis of power systems under transient and steady-state conditions. Three hours rec. a week. Pr.: E.E. 682. 530-688-0-0909

530 690. Problems in Electrical Engineering. (Var.) I, II, S. 530-690-3-0909

530 692. Operational Circuit Analysis. (3) I. Properties and classification of linear systems, Fourier Series, Fourier transform and related power and phase spectra, energy density spectrum, Laplace transform of periodic and aperiodic signals, transform analysis of linear systems, ideal filters, two-port networks, system analysis by convolution. Three hours rec. a week. Pr.: E.E. 511. 530-692-0-0909

530 695. Solid-State Engineering. (3) I, II. Elastic, thermal, electric and magnetic properties of crystals and metals, conduction in metals and semiconductors; solid state devices. Three hours rec. a week. Pr.: E.E. 557; Phys. 551 or N.E. 410 or N.E. 325. 530-695-0-0909

530 730. Control Systems Analysis and Design. (3) II. Utilization 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.: E.E. 530 or M.E. 712. (Cross-listed with 560 730.) 530-730-0-0909

530 747. Digital Signal Processing Laboratory. (2) I, II. Analog signal digitization; demonstration of aliasing problems; spectral analysis of digital signals using Fourier and other signal representation techniques; digital filtering problems—lowpass, bandpass, notch, etc.; application examples related to biomedical and speech data. Six hours lab. a week. Pr.: C.S. 200 and E.E. 647. 530-747-1-0909

530 758. Electromagnetic Theory II. (3) I, II. Continuation of 530 557. Three hours rec. a week. Pr.: E.E. 557. 530-758-0-0909

530 759. Radar Systems. (3) On sufficient demand. A study of radar systems including radar cross section, noise in target detection, doppler radar, scanning systems, propagation effects and error analysis; radar transmitters, receivers, antennas, and displays. Three hours rec. a week. Pr.: Consent of instructor. 530-759-0-0909

530 761. 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.: Senior standing in electrical engineering. 530-761-0-0909

530 771. Control Theory Applied to Bioengineering. (3) I. 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.: E.E. 530 or M.E. 712. Also a basic physiology course. 530-771-0-0909

530 772. Theory and Techniques of Bioinstrumentation. (3) II. 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.: E.E. 771 or consent of instructor. 530-772-0-0909

530 791. Matrix Methods Applied to Electrical Engineering. (3) I. Applications of matrices and linear vector spaces to electrical systems. Three hours rec. a week. Pr.: E.E. 692. 530-791-0-0909

Graduate Credit

530 816. Network Synthesis I. (3) I. Basic properties of network functions. Passive synthesis of driving point impedances, transfer functions and transfer impedances. Three hours rec. a week. Pr.: E.E. 692. 530-816-0-0909

530 817. Network Synthesis II. (3) II. Active synthesis of driving point impedances, transfer functions and transfer impedances using operational amplifiers, gyrators and negative immittance converters. Three hours rec. a week. Pr.: E.E. 816. 530-817-0-0909

530 830. Advanced Feedback Control Systems. (3) II. A second course in the analysis and design of feedback control systems using both classical and modern control theory. Both linear and nonlinear systems are considered. Three hours rec. a week. Pr.: E.E. 730. 530-830-0-0909

530 836. Sampled-data Control Systems. (3) On sufficient demand. Analysis and design of sampled-data control systems using Z-transforms; study of digital computer controlled systems. Three hours rec. a week. Pr.: E.E. 730. 530-836-0-0909

530 838. Optimal Control Systems. (3) On sufficient demand. A study of the methods of the optimization of feedback control systems, with particular emphasis placed on Pontryagin's maximum principles and Belman's functional analysis. Three hours rec. a week. Pr.: E.E. 730. 530-838-0-0909

530 855. Advanced Electromagnetic Theory I. (3) I. Mathematical development of electromagnetic wave theory. Three hours rec. a week. Pr.: E.E. 659. 530-855-0-0909

530 856. Advanced Electromagnetic Theory II. (3) II. Plane waves in unlimited isotropic media, cylindrical waves, spherical waves, radiation, and boundary value problems. Three hours rec. a week. Pr.: E.E. 855. 530-856-0-0909

530 862. Modulation Theory. (3) II, in alt. years. A study of the most widely used modulation systems, with particular emphasis on the evaluation of their performances in modern communication systems. Three hours rec. a week. Pr.: E.E. 761. 530-862-0-0909

530 865. 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.: E.E. 661. 530-865-0-0909

530 866. Signal Processing and Classification. (3) I, II. Theoretical considerations of orthogonal transforms in digital signal processing with emphasis on data compression, generalized Wiener filtering, and feature selection in pattern recognition. Three hours rec. a week. Pr.: E.E. 761. 530-866-0-0909

530 881. 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.: E.E. 686. 530-881-0-0909

530 890. Advanced Electrical Theory. (Var.) I, II. For advanced study in specialized areas by M.S. students. Pr.: M.S. Student. 530-890-3-0909

530 891. Graduate Seminar in Electrical Engineering. (1) I, II. Discussion of current advances and research in electrical engineering. 530-891-3-0909

530 897. Research in Electrical Engineering. (Var.) I, II, S. Special research problems in electrical engineering. Pr.: Consent of instructor. 530-897-4-0909

530 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. 530-898-4-0909

530 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. 530-899-4-0909

530 957. Advanced Electromagnetic Theory Seminar. (3) On sufficient demand. Advanced topics in electromagnetic theory. Three hours rec. a week. Pr.: E.E. 856. 530-957-0-0909

530 958. Antenna Theory. (3) On sufficient demand. Principles of radiation, directivity, and other characteristics of antenna systems; linear, short-wave beam and fire, omnidirectional, wide-band, slot, horn, and parabolic antennas; reflectors and lenses. Three hours rec. a week. Pr.: E.E. 855. 530-958-0-0909

530 961. Advanced Topics in Communications, Information and Controls. (3) On sufficient demand. Study of advanced topics and recent developments in the areas of communication and information theory, information processing and control systems. May be repeated. Three hours rec. a week. Pr.: E.E. 761. 530-961-0-0909

530 971. 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.: E.E. 771 or E.E. 772. 530-971-0-0909

530 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. 530-999-4-0909

ENGINEERING TECHNOLOGY

Kenneth K. Gowdy, Head of Department*

Professor Lindholm;* Associate Professor Gowdy;* Assistant Professor Vaughan; Instructor Walker.

Undergraduate Credit

540 430. Electronic Fabrication Laboratory (2) I, II. Laboratory experience in the layout, fabrication and assembly of electronic circuits. Project oriented with an emphasis on printed circuit boards. Six hours lab. a week. Pr. or conc.: Phys. 114. 540-430-0-0925

540 499. Problems in Engineering Technology. Credit arranged. I, II, S. Pr.: Approval of instructor. 540-499-3-0925.

Undergraduate And Graduate Credit In Minor Field

540 510. Properties of Engineering Materials. (3) I. Engineering requirements of materials: mechanical, thermal, electrical, and biological properties and behavior of materials. Two hours rec. and three hours lab. a week. Pr.: Chem. 110 or Chem. 210 and Phys. 113. 540-510-1-0925

540 512. 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. Two hours rec. and three hours lab. a week. Pr.: Phys. 113. 540-512-1-0925

540 514. Energy Conversion Technology. (3) II. Introduction to energy conversion technology, energy, and power; thermodynamics, power cycles, and refrigeration. Three hours rec. a week. Pr.: Chem. 110 or Chem. 210, Phys. 113. 540-514-0-0925

540 515. Materials Testing. (4) I, II. Survey of ASTM testing procedures and laboratory application. Mechanical, thermal, electrical, optical, and chemical property determination. Analysis of structure through x-ray, electron microscopy, spectral analysis, thermal analysis, rheology and other methods. Introduction to experimental stress analysis. Three hours lec. and three hours lab. a week. Pr.: E.T. 510, C.E. 331. 540-515-1-0925

540 520. Wastewater Treatment Technology. (3) II. Application of waste treatment technology for pollution control. Emphasis is placed upon process operation and monitoring, field sampling and data interpretation. Field trips and laboratory experiments are a major portion of the course. One hour rec. and six hours lab. a week. Pr.: C.E. 563. 540-520-1-0925

540 521. Water Treatment Technology. (3) I. Application of water treatment technology to design, operation, and monitoring in the water treatment industry. Emphasis is placed on process understanding through field trips and laboratory experience. Two hours rec. and three hours lab. a week. Pr.: C.E. 563. 540-521-1-0925

540 522. Air Pollution Control Technology. (2) I, II. An introduction to air pollution control, including Federal regulations, meteorology, and damages from air pollution. Control techniques for particulate and gaseous pollutants, and automobile exhausts are covered. Two one-hour lectures a week. Pr.: Consent of instructor. 540-522-0-0925

540 530. Electrical Circuit Technology I. (4) I, II. D-C and A-C steady state circuit analysis. Study of resistance, capacitance and inductance. Basic magnetic circuits. Polyphase steady state circuits. Brief study of A-C machinery with emphasis on selection and applications. Not for graduate credit for students in the College of Engineering. Three hours lec. and three hours lab. a week. Pr.: Phys. 114, Math. 210 or 220. 540-530-1-0925

540 531. Electrical Circuit Technology II. (3) II. Additional study in circuit analysis including resonant circuits, coupled circuits nonsinusoidal analysis and transient analysis. A brief introduction to LaPlace transform techniques. Not for graduate credit for students in the College of Engineering. Two hours lec. and three hours lab. a week. Pr.: E.T. 530. 540-531-3-0925

540 532. Instrumentation and Measurement Technology. (3) I, II. Principles and application of instrumentation and measurement equipment. One hour rec. and six hours lab. a week. Pr.: E.T. 530. 540-532-1-0925

540 534. Automatic Control Technology. (3) II. Application oriented control systems technology including basic systems dynamics, regulatory, servo, and computer control; and system specifications. Two hours rec. and three hours lab. a week. Pr.: E.T. 530. 540-534-1-0925

540 535. Digital Logic Systems I. (4) I. Use of combinational and sequential circuits in the fashioning of digital systems and sub-systems. Three hours lec. and one three-hour lab. a week. Pr.: E.E. 525 and E.T. 530. 540-535-1-0925

540 536. Digital Logic Systems II. (4) II. 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.: E.T. 535. Pr. or conc.: E.E. 526. 540-536-1-0925

540 537. Electronic Measurements Laboratory. (1) I, II. Practical experience in the theory and techniques associated with commonly used electronic measuring instruments. Major emphasis is placed on use of instruments in measurement or performance of various electronic circuits and devices. One three-hour lab. a week. Pr.: E.T. 530. Pr. or conc.: E.E. 525. 540-537-1-0925

540 538. Computer and Instrumentation Technology Seminar. (1) I, II. Preparation and oral presentation of a written technical report. One hour a week. Pr.: Senior standing in engineering technology. 540-538-0-0925

540 550. Heat Treatment—Tool & Die Steels. (3) I, II. Classification, selection, heat treating and testing of steels in tool and die applications. Two hours rec. and three hours lab. a week. Pr.: E.T. 510. 540-550-1-0925

540 551. Materials Processing. (4) I, II. Study of the fabrication techniques employed in the manufacture of consumer products. Discussion of forming operations including drawing, molding, casting, rolling, heat treatment and extrusion. Preparation of coatings, fibers, and composites. Discussion of machineability and surface finish characteristics. Two hours lec. and six hours lab. a week. Pr.: E.T. 510, I.E. 241. 540-551-1-0925

540 560. 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.: C.E. 231. 540-560-1-0925

540 561. 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.: E.T. 560 and C.E. 331. 540-561-0-0925

540 562. Mechanical Design Lab I. (2) I, II. 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. or conc.: E.T. 561. 540-562-1-0925

540 563. Mechanical Design Lab II. (2) I, II. Continuation of Mech. Des. Lab I project with completion of detail design and drawings. Possibly building and testing components designed. Six hours lab. a week. Pr.: E.T. 562. 540-563-1-0925

540 580. Nuclear Engineering Technology. (4) II. Concepts of nuclear energies, nuclear reactions, nuclear radiation, radioisotope application, nuclear reactors and associated plant facilities, waste disposal, radiation protection, and economics as applied to nuclear engineering. Three hours rec. and three hours lab. a week. Pr.: Math. 210 or Math. 220 and Phys. 113. 540-580-1-0925

540 581. Nuclear Radiation Measurements. (3) I. Principles of nuclear radiation detection. Detectors and measurement systems. Application to radiation dosimetry and spectroscopy. Instrumentation for data analysis and system control with emphasis on reactor control. Two hours rec. and three hours lab. a week. Pr.: E.T. 537 and E.T. 580. 540-581-1-0925

540 582. Radiation Protection Technology. (5) II. Concepts of radiation protection. Radiation dosimetry; radiation shielding and exposure control; radiation biological effects. Licensing and regulation procedures. Three hours rec. and six hours lab. a week. Pr.: E.T. 581. 540-582-1-0925

540 640. Food Processing Operations I. (4) I, II. A study of food processing unit operations and their applications with emphasis on heat transfer operations such as evaporation, drying, sterilization, freezing and thawing. Three hours rec. and three hours lab. a week. Pr.: E.T. 512 and E.T. 514. 540-640-1-0925

540 641. Food Processing Operations II. (4) I, II. Continuation of 540 640 with emphasis on mass transfer operations such as distillation, extraction, adsorption, and ultrafiltration. Three hours rec. and three hours lab. a week. Pr.: E.T. 640. 540-641-1-0925

GENERAL ENGINEERING

Donald E. Rathbone, Dean

Undergraduate Credit

500 010. Engineering Lectures. (0) I. Designed to acquaint freshman engineers with fundamental principles of their profession and to give a general survey of career opportunities in engineering. One hour of lecture a month. The dean, other members of the faculty, and visiting practicing engineers will present the lectures. 500-010-0-0901

500 160. 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. 500-160-1-0901

500 200. 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. 500-200-2-0901

500 202. Introduction to Environmental Technology. (3). An introductory course designed primarily for nonengineering students. An introduction to the technology employed in analyzing environmental and ecological processes, the technology of pollution control and materials recycle, and the technology of energy and power generation. Two hours lec. and one hour rec. a week. 500-202-0-0901

500 250. Impact of Engineering Technology on Society. (3) I, II. A study of social, economic and environmental problems as a function of technology. Study 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. 500-250-0-0901

500 299. Honors Seminar in Engineering. (1) I, II. Selected topics of general interest. Open to sophomores in the Engineering Honors Program for two semesters. 500-299-0-0901

500 310. Perspectives in Energy. (2) I. Introduction to the uses and technological concepts of energy. Types of energy sources in current use, transformation of energy from one form to another, nuclear power reactor safety, energy conservation, and cost/benefit concepts. The laboratory includes experiments on radiation protection and energy conservation. One hour rec. and three hours lab. a week. Open to all non-engineering majors. 500-310-0-0901

500 325. Cooperative Work Experience. (1) I, II, S. Industrial assignment on Engineering Work-Study Program. May not be taken for more than four sessions for credit. Pr.: Approval of program coordinator. 500-325-2-0901

500 380. 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. 500-380-0-0910.

500 399. Honors Colloquium in Engineering. (1) I, II. Selected topics of general interest. Open to juniors in the Engineering Honors Program for two semesters. 500-399-0-0901

500 401. Seminar in Engineering. (1) I, II, S. Selected topics of general interest. Open to undergraduate students from all colleges. 500-401-0-0901

500 402. Research in Engineering. (Var.) I, II, S. Individual or group research problem selected with approval of faculty adviser. 500-402-4-0901

500 420. 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 non-engineering and first and second year engineering students. 500-420-0-0901

500 450. 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. 500-450-0-0901

500 499. Honors Research in Engineering. (1) I, II. Individual research problem selected with approval of faculty adviser. Open to seniors in the Engineering Honors Program for two semesters. Written report is presented at end of second semester. 500-499-4-0901

500 740. Applied Linear Analysis. (3) I. The application of linear analysis to engineering problems, including derivations of equations, exact and approximate solutions for 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. 500-740-0-0901

500 745. Applied Nonlinear Analysis. (3) II. Study of mechanical or electrical systems governed by nonlinear equations, elliptic integrals, geometry of integral curves, and phase plane, Lienard's graphical construction, Poincare's classification of singular points, stability and instability. Three hours rec. a week. Pr.: Math 240. 500-745-0-0901

500 870. Transform Calculus Applied to Engineering Problems. (3) II. The Laplace, sine, cosine, Hankel, Legendre, Fourier, and Jacobi transforms applied to the solution of initial and boundary value problems in the ordinary and partial differential equations arising in engineering. Three hours rec. a week. Pr.: Math. 550. 500-870-0-0901

INDUSTRIAL ENGINEERING

Frank A. Tillman, Head of Department*

Professors Bennett,* Hwang,* Konz,* Lee,* Smaltz,* and Tillman;* Associate Professors Bussey,* D. Grosh,* L. Grosh,* Roth,* Wilson, and Woodard;* Assistant Professor Byers; Emeritus: Professors Clifton, Darby, Hansen, Hostetter, and Nelson.

The curriculum in industrial engineering emphasizes the design, improvement, and installation of integrated systems of men, 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 micro-processor, computer aided manufacturing has become a major thrust in manufacturing. This area has provided a new frontier for industrial engineering.

Opportunities for employment are available in all types of businesses and industries. Graduates may be engaged in staff positions in work study, work flow design, safety engineering, economic analysis, process design, process control, cost control, manufacturing management, ergonomics, production processes, operations research, and many other areas.

In addition, their unique background makes them unusually well-fitted for positions in manufacturing management. Managers need factual information arranged to define different alternatives and their consequences to help recognize and solve existing problems. Industrial engineers collect, analyze and arrange this information in such a way as to fulfill this need, at the same time continuing to search for better ways to do the job at less financial and human cost.

The remarkable strides made by the industrial engineering profession during the past several years are reflected in the demand for industrial engineering graduates. 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 varied industrial areas including processing and control systems, and human factors engineering. Several strong 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 which satisfies the major areas required in the undergraduate industrial engineering curriculum at Kansas State University.

Facilities and equipment for advanced study and research are extensive and majors in the department have essential access to the University Computing Center.

A University remote computing laboratory is located in Seaton Hall. This adjunct facility contains a card reader and printer in addition to typewriter units connected directly to the University's IBM 370/158 computing system.

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.

Courses in Industrial Engineering

Undergraduate Credit

550 015. Engineering Assembly. (0) I, II. Presentation by students of abstracts and reviews of articles in the journals of their respective societies or in the technical press of their profession, and reports of engineering projects, industrial experiences, and original investigations conducted by the student branches of the professional engineering societies. Occasionally two or more of these individual groups unite for lectures by practicing engineers and by members of the engineering and university faculties. One hour of lec. a week, sophomore, junior, and senior years. 550-015-0-0913

550 050. 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. 550-050-2-0913

550 120. Introduction to Industrial Engineering. (2) II. A survey of functions in the industrial organization including management; organization; work design; personnel; quality, inventory and production control and ancillary activities. Two hours rec. a week. 550-120-0-0913

550 241. Production Processes. (3) I, II. The study of modern industrial processes for production. Basic mechanics of metal machining and forming; flow and solidification of molten alloys; welding and heat treatment. Emphasis will be placed on actual production operations. One hour rec. and six hours lab. a week. 550-241-1-0913

550 271. Computer Applications in Engineering. (1) I, II. Brief introduction to Fortran IV using the WATFIV Compiler. Examples using application programs such as APT, ECAP, ICES, and MPS/360. Three hours lab. a week. 550-271-1-0913

550 352. Tool Engineering. (3) II. Study of basic metal working processes and the new developments in metal cutting and forming. Design of jigs, fixtures, dies and other tooling for effective production. Two hours rec. and three hours lab. a week. Pr.: I.E. 241. 550-352-1-0913

550 372. Computers and Data Processing. (2) I, II, S. The use of computers in the solution of engineering and management problems. One hour rec. and three hours lab. a week. 550-372-1-0913

Undergraduate And Graduate Credit In Minor Field

550 501. Industrial Management. (3) I, II. Basic functions in an industrial organization and their interrelationships; management considerations involving product, process, plant and personnel. Three hours rec. a week. Pr.: Sophomore standing in engineering or consent of instructor. 550-501-0-0913

550 502. Industrial Management II. (3) I. Job analysis and evaluation, selection, training, and other considerations for new employees from the industrial engineering standpoint. Three hours rec. a week. Pr.: Junior standing in engineering. 550-502-0-0913

550 530. 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. 550-530-0-0913

550 533. Interior Ergonomics. (3) I, II. Factors influencing the human use of interior spaces. Design for health, safety, performance, comfort and pleasantness. Emphasis on human characteristics, evaluation and environmental effects. Three hours rec. a week. Pr.: Junior standing or above. 550-533-0-0913

550 541. Engineering Reliability and Quality Assurance I. (3) I, II. Quantitative and qualitative controls required by manufacturing industries, with special emphasis on controlling process quality and costs. Three hours rec. a week. 550-541-0-0913

550 551. Work Design. (3) I. Motion and time study; process analysis and charting; principles of motion economy and ergonomics; work stations and environments; biomechanics; micro-motion analysis and an introduction to standard data systems. Two hours rec. and three hours lab. a week. Pr.: I.E. 241. 550-551-1-0913

550 552. 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.: I.E. 352. 550-552-0-0913

550 553. Production Planning and Inventory Control. (3) I. Principles, techniques and applications of production planning and control, and inventory control. Two hours rec. a week. Pr.: I.E. 372 and Math. 222. 550-553-0-0913

550 554. Industrial Facilities Layout and Design. (3) II. Comprehensive design of an industrial production system; application of undergraduate industrial engineering sequence. Two hours rec. and three hours lab. a week. Pr.: I.E. 553. 550-554-1-0913

550 571. Introduction to Operations Research I. (3) I, II. Formulation of the linear programming model and solution by graphical, algebraic, and simplex techniques. Sensitivity analysis using dual-simplex method. The transportation and assignment models, and critical path method. Three hours rec. a week. Pr.: Math. 222. 550-571-0-0913

550 572. Introduction to Operations Research II. (3) II. Further optimization techniques, including elementary treatment of non-linear programming and dynamic programming. The queueing model. Three hours rec. a week. Pr.: I.E. 571, and Stat. 510. 550-572-0-0913

550 573. Industrial Simulation. (3) II. Introduction to modeling of industrial processes using digital simulations. The effect of simulation languages on modeling concepts will be stressed. Three hours rec. a week. Pr.: I.E. 372, Stat. 510. 550-573-0-0913

550 575. 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. 550-575-0-0913

Undergraduate And Graduate Credit

550 601. Introduction to Systems Management. (3) I, II. 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, utilizing optimization theory, finite mathematics and statistical techniques. Three hours rec. a week. Pr.: Math. 222 and consent of instructor. 550-601-0-0913

550 603. 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.: I.E. 501, I.E. 571, or consent of instructor. 550-603-0-0913

550 609. Occupational Safety and Health. (3) I, II. Hazards in occupational environments and their elimination or mitigation through quantitative analyses and engineering design. Two hours rec. and three hours lab. a week. Pr.: Junior standing. 550-609-1-0913

550 625. The Man-Environment System. (3) II. Basic structure and performance of the human, viewed as a component in information processing and control systems. Effect of visual, auditory and thermal environments. Two hours rec. and two hours lab. a week. (Cross listed with M.E. 625). Pr.: Senior standing in engineering. 550-625-0-0913

550 651. Standard Data Systems. (3) I. Microscopic and macroscopic standard data systems; commercial versions; company-developed plans; programmed standard data systems. Three hours rec. a week. Pr.: I.E. 372. 550-651-0-0913

550 652. Industrial 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. Three hours rec. a week. Pr.: Math. 222 and consent of instructor. 550-652-0-0913

550 721. Numerical Control of Machine Tools. (3) II. 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.: I.E. 352, I.E. 372. 550-721-1-0913

Graduate Credit

550 801. Problems in Industrial Engineering. (Var.) I, II, S. Pr.: Graduate standing. 550-801-3-0913

550 805. Engineering Administration. (3) I. Engineering project administration; organization dynamics; quantitative factors in decision-making; application of computerized and non-computerized games. Two hours rec. and three hours lab. a week. Pr.: I.E. 502 or consent of instructor. 550-805-1-0913

550 811. 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.: I.E. 553 or consent of instructor. 550-811-0-0913

550 830. Industrial Project Selection. (3) I. The determination of policy that optimally allocates resources to industrial alternatives. Deterministic and probabilistic model formulation with and without constraints. Applications of linear, nonlinear and branch-and-bound zero-one optimization methods. Rational selection criteria. Three hours rec. a week. Pr.: I.E. 530. 550-830-0-0913

550 842. Engineering Reliability and Quality Assurance II. (3) II. Design and management of reliability programs and quality assurance systems; mathematics of reliability, case studies of reliability evaluation programs. Three hours rec. a week. Pr.: I.E. 541 or consent of instructor. 550-842-0-0913

550 850. Human Factors Engineering I. (3) I. The design and analysis of applied experimental research on human behavior as applied to engineering systems. Two hours rec. and three hours lab. a week. Pr.: Stat. 702 or 703. 550-850-0-0913

550 865. Simulation of Industrial and Management Systems. (3) II. This course is concerned with simulating industrial management systems on computers utilizing Monte Carlo techniques and simulation languages. Numerical methods related to simulation are to be covered. Three hours rec. a week. Pr. or conc.: Stat. 770 or consent of instructor. 550-865-0-0913

550 872. 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 will be studied in solving industrial engineering problems. Three hours rec. a week. Pr.: Stat. 511 or 705. 550-872-0-0913

550 874. Operations Research I. (3) I. 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.: I.E. 572. 550-874-0-0913

550 881. 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.: I.E. 575. 550-881-0-0913

550 892. Graduate Seminar in Industrial Engineering. (1) I, II. Max. total: three credit hours. Presentation and discussion of papers on industrial engineering subjects. One two-hour seminar a week. 550-892-0-0913

550 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. 550-898-4-0913

550 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. 550-899-4-0913

550 930. Industrial Resource Management. (3) II. Applications of mathematical optimization methods and simulation techniques to the problems of industrial resource acquisition, retention and management. Associated individual student minor research topic. Three hours rec. a week. Pr.: I.E. 573 (or I.E. 865) and I.E. 830. 550-930-0-0913

550 950. Human Factors Engineering II. (3) II. The design and analysis of applied experimental research on human behavior as applied to engineering systems. An experimental project. Three hours rec. a week. Pr.: Stat. 702 or 703. 550-950-0-0913

550 951. Applied Decision Theory. (3) II. Bayes theorem, Bayesian estimators, utility, loss function and risk, minimax strategies, elementary game theory and linear programming. Pr.: Stat. 511 or Stat. 770. 550-951-0-0913

550 971. Industrial Queueing Processes. (3) I, II. Introduction to the queueing process and theory of queues; analysis of single and multi-station queues; application to production, materials handling, inventory and maintenance systems. Three hours rec. a week. Pr.: Stat. 770. 550-971-0-0913

550 973. Industrial Systems Analysis. (3) 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. Three hours rec. a week. Pr. or conc.: I.E. 575. 550-973-0-0913

550 975. Operations Research II. (3) II. A continuation of I.E. 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.: I.E. 874, Stat. 770. 550-975-0-0913

550 976. 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. 550-976-0-0913

550 982. 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.: I.E. 975. 550-982-0-0913

550 983. 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.: I.E. 874, Stat. 770. 550-983-0-0913

550 985. The Application of the Maximum Principle to Industrial Systems. (3) I. A study of multistage systems optimization by the discrete maximum principle and a study of optimal decision and optimal control of continuous systems by the continuous maximum principle. Applications to production scheduling, inventory controls, transportation problems, economic systems and other industrial management problems. Three hours rec. a week. Pr. or conc.: I.E. 874. 550-985-0-0913

550 990. Advanced Topics in Operations Research. (Var.) I, II, S, (6 hrs. maximum). 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. 550-990-0-0913

550 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. 550-999-4-0913

MECHANICAL ENGINEERING

Paul L. Miller, Head of Department*

Professors Appl,* Azer,* Crank,* Duncan,* Gorton,* Huang,* Lindholm,* Miller,* Rohles,* Turnquist,* Walker,* and Wood; Associate Professors Annis,* Gowdy,* Kipp,* Nesmith, and Thompson;* Assistant Professors Ball,* Pauli, and Sinha. Emeritus: Dean Durland; Professors Brainard, Flinner, Helander, Hobson, Messenheimer, and Tripp.

Mechanical engineering graduates render professional services that vary from the development of machines to the management of industrial operations; from theoretical systems to the satisfaction of societal needs.

Mechanical engineering deals with the conversion, transfer and control of energy for the benefit of man. Mechanical engineers design, develop, create, supervise, manufacture and sell components and systems which are utilized in the processes involving energy. KSU graduates are contributing to the benefit of mankind by their work in pollution control, computers, food supply and processing, communication systems, power generation and distribution, petroleum location and production, aircraft, environmental control, transportation, construction, atomic energy, etc.

To provide a background for this wide range of activities the mechanical engineering curriculum is founded on a broad base of the basic sciences of mathematics, physics, chemistry and mechanics. 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 integrated through 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 an authentic engineering problem supplied by an industrial sponsor. Considerations of cost, social impact, economics, product life, and the like are usually involved, as well as the technical solution of the problem. At the end of the project a written report is prepared and a verbal presentation made to engineers and officials of the sponsoring company. Frequently a working model is fabricated and demonstrated. 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. Professionals with this type of interdisciplinary background are ideally prepared to contribute to the solutions of the most pressing social and technological problems of our day.

The electives in the curriculum provide the opportunity for students to develop their own special interests. Students with clear career objectives may be permitted to substitute appropriate courses for some of the "required" courses.

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. A student, particularly at the doctorate level, in addition to major studies 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 the areas of heat transfer, thermodynamics, air conditioning, energy conversion, automatic control, fluid and gas dynamics, aerodynamics, environmental engineering, biomedical engineering, propulsion systems, engineering design, kinematics and vibrations. Laboratory facilities and basic instrumentation are available for experimental work in these areas. Graduate students also have access to the University's digital and analog computers, and the various engineering laboratories and shops.

Many research and teaching assistantships and free-grant fellowships are available to graduate students.

Courses in Mechanical Engineering

Undergraduate Credit

560 212. Graphical Communications, Analysis and Design I. (2) I, II, S. Technical sketching; study of basic principles of projective geometry; multi-view drawings; pictorials; reading and interpreting drawings; and creative or conceptual design. Three hours lab. and one hour rec. a week. Pr.: Plane Geometry. 560-212-1-0910

560 217. Graphical Communications, Analysis and Design II. (3) I, II, S. Advanced study and application of projective geometry principles; functional design; detail and assembly layouts; design of charts and graphs; and conceptual design. Five hours lab. and one hour rec. a week. Pr.: M.E. 212. 560-217-1-0910

560 390. 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. 560-390-0-0910

560 440. Engineering Systems Analysis. (3) I, II. Application of physical laws, mathematical methods and computers to the development and interpretation of models for physical systems of engineering interest. Emphasis is on the methods of modeling rather than the systems modeled. Examples will be taken from all areas of engineering. Three hours rec. a week. Pr.: Phys. 214; Math. 240. 560-440-0-0910

Undergraduate And Graduate Credit In Minor Field

560 512. 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.: C.E. 333, Math. 222. 560-512-0-0910

560 513. 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. 560-513-0-0910

560 523. Thermodynamics II. (3) I, II. Continuation of Thermodynamics I. Gas mixtures, psychrometry, generalized thermodynamic relations and reactive systems. Three hours rec. a week. Pr.: M.E. 513. 560-523-0-0910

560 527. 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.: M.E. 571, Math. 240. 560-527-0-0910

560 533. 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.: M.E. 512. 560-533-0-0910

560 535. Mechanical Engineering Laboratory I. (3) I, II. Theory and application of mechanical engineering instrumentation and measurements. One hour rec. and six hours lab. a week. Pr.: M.E. 513, E.E. 519. 560-535-1-0910

560 560. Engineering Economics. (3) I, II. Economic analysis of problems as applied in engineering. Three hours rec. a week. Pr.: Econ. 110, M.E. 513. 560-560-0-0910

560 563. 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.: C.E. 533, M.E. 533. 560-563-0-0910

560 571. 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.: M.E. 512. Pr. or conc.: M.E. 513. 560-571-0-0910

560 575. Mechanical Engineering Design Laboratory. (2) 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.: M.E. 527, M.E. 533. 560-575-1-0910

560 583. Mechanical Engineering Laboratory II. (2) I, II. Analysis of heat transfer and fluid flow processes, mechanical systems, automatic control; instrumentation, design of experiments. Six hours lab. a week. Pr.: M.E. 535. 560-583-1-0910

Undergraduate And Graduate Credit

560 606. Patents and Inventions. (3) II. A brief consideration of the fundamental principles of U.S. patents and their relationship to the engineer; the inception and development of inventions. Three hours rec. a week. Pr.: Junior standing. 560-606-0-0910

560 613. Thermodynamics III. (3) On sufficient demand. Direct energy conversion, compressible fluid flow, rotating and reciprocating machinery, thrust systems, cycle analysis and topics of current and continuing interest with emphasis on application of thermodynamic principles. Three hours rec. a week. Pr.: M.E. 523. 560-613-0-0910

560 620. Internal Combustion Engines. (3) II. Analysis of cycles, design and performance characteristics. Three hours rec. a week. Pr.: M.E. 523. 560-620-0-0910

560 622. Environmental Engineering I. (3) I, II. Psychrometry; heating-cooling system design; air quality measurement and control; effect of air pollution. Three hours rec. a week. Pr.: M.E. 527. 560-622-0-0910

560 625. The Man-Environment System. (3) II. Basic structure and performance of the human, viewed as a component in information processing and control systems. Effect of visual, auditory and thermal environments. Two hours rec. and two hours lab. a week. (Cross listed with I.E. 625.) Pr.: Senior standing in engineering. 560-625-1-0910

560 628. Aerodynamics I. (4) II. A general introduction to aerodynamics; operation of wind tunnel. Three hours rec. and three hours lab. a week. Pr.: M.E. 571, Math. 240. 560-628-1-0910

560 631. Aircraft and Missile Propulsion. (3) II. Analysis of aircraft and missile propulsion systems; fundamentals of jet propulsion including rocket engines. Three hours rec. a week. Pr.: M.E. 523, M.E. 571, Math. 240. 560-631-0-0910

560 633. 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.: M.E. 513. 560-633-0-0913

560 651. Mechanical Engineering Design. (3) II. Professional-type problems involving thermal, thermodynamic, electrical, mechanical, and economic factors. One hour rec. and six hours lab. a week. Pr.: M.E. 527, M.E. 563. 560-651-1-0910

560 656. 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.: M.E. 512, Math. 240. 560-656-0-0910

560 671. Petroleum Production. (3) I. Engineering problems in drilling and completion of wells; principles of drainage; production methods and secondary recovery. Three hours rec. a week. Pr.: Senior standing in Department of Mechanical Engineering or approval of department head. 560-671-0-0910

560 680. Solar Energy Thermal Processes. (3) II. Fundamentals of solar radiation, its measurement and techniques for predicting its magnitude; an introduction to the heat transfer involved in solar collectors; modeling techniques for flat plate and focusing collector systems; storage system performance; an overview of solar energy thermal systems such as solar heating and cooling; solar system economics. Three hours rec. a week plus periodic laboratory experiments. Pr.: M.E. 527. 560-680-0-0910

560 699. Problems in Mechanical Engineering. (Var.) I, II, S. Pr.: Approval of department head. 560-699-3-0910

560 712. Automatic Controls. (3) I, II. Analysis of the dynamic behavior of mechanical, thermal, fluid and electrical elements using the basic physical laws. Transient and frequency response characteristics, stability and sensitivity analysis. Design of automatic control systems. Three hours rec. a week. Pr.: M.E. 535. 560-712-0-0910

560 713. Advanced Thermodynamics I. (3) I. Application of the laws of thermodynamics to unsteady-flow processes; processes involving friction; available and unavailable portions of various forms of energy; the concept of flux mass, energy, available energy, and entropy. Three hours rec. a week. Pr.: M.E. 523, M.E. 571, Math. 240. 560-713-0-0910

560 715. Gas Dynamics I. (3) II. Properties of compressible fluids, subsonic and supersonic flow, steady and nonsteady motion, with emphasis on one-dimensional flow. Three hours rec. a week. Pr.: Math. 240, M.E. 523, M.E. 571. 560-715-0-0910

560 716. Intermediate Dynamics. (3) On sufficient demand. General vector principles of the dynamics of particles and rigid bodies; applications to orbital calculations, gyrodynamics and rocket performance; introduction to the energy methods of advanced dynamics. Three hours rec. a week. Pr.: M.E. 512, Math. 240. 560-716-0-0910

560 718. Introduction to the Theory of Continuous Media. (3) I. Analysis of strain, motion and stress; fundamental laws; constitutive equations; applications to fluid, elastic, and plastic media. Three hours rec. a week. Pr.: M.E. 512, Math. 240. 560-718-0-0910

560 719. Engineering Acoustics I. (3) I, in odd years. An introduction to engineering acoustics and its application. Laboratory type demonstrations include the measurement and control of sound and noise. Three hours rec. a week. Pr.: Math. 240, M.E. 512 or C.E. 530. 560-719-0-0910

560 720. Intermediate Fluid Mechanics. (3) I. An introduction to the general analytical relations of fluid flow, viscous flow, turbulence, boundary layer theory; applications. Three hours rec. a week. Pr.: M.E. 571, Math. 240. 560-720-0-0919

560 722. Environmental Engineering II. (3) II. Study and analysis of environmental factors and man's response to these factors; air pollution, air cleaning, biological heat transfer; factors affecting comfort, health, learning and productivity. Two hours rec. and three hours lab. a week. Pr.: Four hours biological science or consent of instructor. Pr.: M.E. 622. 560-722-0-0910

560 725. Combustion. (3) I. Dynamics and thermodynamics of combustion processes; solid, liquid, and gaseous fuels. Three hours rec. a week. Pr.: M.E. 527. 560-725-0-0910

560 728. Aerodynamics II. (4) I. Compressibility phenomena, power requirements, airplane performance; stability and control. Three hours rec. and three hours lab. a week. Pr.: M.E. 628. 560-728-1-0910

560 730. Control Systems Analysis and Design. (3) II. Utilization 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.: E.E. 530 or M.E. 712. (Cross-listed with E.E. 730.) 560-730-0-0910

560 733. Automatic Controls Laboratory. (3) II. Experimental methods for automatic control systems and components. Six hours lab. a week. Pr. or conc.: M.E. 730. 560-733-1-0910

560 735. Fluid Control Systems. (3) I. Analysis and design of control devices and systems which utilize gases or liquids as the working media; formulation of non-linear and linearized mathematical models; laboratory projects applying analytical and experimental design techniques. Two hours rec. and three hours lab. a week. Pr.: M.E. 535. 560-735-1-0910

560 736. Applied Elasticity. (3) II. 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.: C.E. 533. 560-736-0-0910

560 742. Fine Particle Technology. (3) II. Definition, theory and measurement of particle properties, particle dynamics, size distribution and characteristics of powders encountered in particle transport, gas cleaning, air pollution sampling and particle processing; the physics of air ion generation, transport and decay; and requisites of accurate sampling of airborne contaminants. Three hours rec. a week. Pr.: M.E. 571 and one course in statistics or consent of instructor. 560-742-0-0910

560 746. Random Vibration. (3) I, in even years. Theory of random processes and application to random vibration of mechanical systems. Three hours rec. a week. Pr.: M.E. 656. 560-746-0-0910

560 756. Machine Vibrations II. (3) II. 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.: M.E. 656. 560-756-0-0910

560 757. Kinematics. (3) II, in odd years. Geometry of constrained motion applied to point paths, specific input-output relations, function generators, kinematic synthesis. Three hours rec. a week. Pr.: M.E. 533. 560-757-0-0910

560 758. Mechanics of Machines. (3) On sufficient demand. Analysis of inertia effects in rotating discs, gyroscopes, cams and gear trains. Three hours rec. a week. Pr.: M.E. 533. 560-758-0-0910

560 760. Engineering Analysis I. (3) I, II. Methods of analysis employed in the solution of problems selected from various branches of engineering. Emphasis is placed on discrete systems. Three hours rec. a week. Pr.: Math. 240 and senior standing in engineering. 560-760-0-0910

560 766. Aeronautical Engineering Design. (2) I. Design problems related to aircraft, missiles, and space vehicles. Six hours lab. a week. Pr.: M.E. 527, M.E. 631, M.E. 728. 560-766-1-0910

560 771. Reservoir Engineering. (3) II. Reservoir fluid properties, forces, and energies; mechanics of fluid flow in porous media; control of reservoir performance. Two hours rec. and three hours lab. a week. Pr.: M.E. 671, Math. 240, M.E. 571. 560-771-1-0910

Graduate Credit

560 813. Advanced Thermodynamics II. (3) II. Kinetic theory and statistical thermodynamics, with emphasis on transport properties and engineering applications. Selected topics from classical thermodynamics. Pr.: M.E. 523, M.E. 527 or consent of instructor. 560-813-0-0910

560 819. Engineering Acoustics II. (3) II, in odd years. A study of the generation, propagation, and reproduction of sound, with applications to the transmission and reduction of sound in materials and structures, and the design of acoustic enclosures and filters. Three hours rec. a week. Pr.: M.E. 719, M.E. 718 or M.E. 756. 560-819-0-0910.

560 822. Theory of Elasticity. (3) On sufficient demand. Stress, strain, equations of equilibrium and compatibility, strain-displacement relations for general coordinates; problems in plane stress and plane strain; applications to three-dimensional problems; propagation of elastic waves; complex variables and variational methods. Three hours rec. a week. Pr.: M.E. 718. 560-822-0-0910

560 830. Thermoelasticity. (3) On sufficient demand. Theory and analysis of thermal stresses in elastic and inelastic systems. Pr.: M.E. 718, M.E. 736 or M.E. 822. 560-830-0-0910

560 831. Boundary Layer Theory I. (3) II. 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.: M.E. 527. 560-831-0-0910

560 850. Advanced Power Plant Engineering. (Var.) On sufficient demand. An advanced course in the economic problems in the design of power plants and in the generation of power, selection of equipment, choice of station heat balance, generation of by-product power in industries, and interconnections between utilities and industrial plants for the economical interchange of power. Pr.: M.E. 560 or M.E. 513. 560-850-0-0910

560 851. Vibration of Elastic Bodies. (3) On sufficient demand. Longitudinal, torsional, and lateral vibration of bars; testing of samples of materials by dynamic methods; the Ritz method; vibration of membranes and plates; waves in isotropic elastic mediums; vibration of pavement slabs. Three hours rec. a week. Pr.: M.E. 656. Pr. or conc.: M.E. 736 or M.E. 822. 560-851-0-0910

560 860. Engineering Analysis II. (3) II. Continuation of Engineering Analysis I. Emphasis placed on continuous systems. Three hours rec. a week. Pr.: M.E. 760 or consent of instructor. 560-860-0-0910

560 862. Plasticity. (3) On sufficient demand. Elastic-plastic and fully plastic problems of trusses, beams, and bars in torsion; unrestricted and contained plane strain; limit analysis. Three hours rec. a week. Pr.: M.E. 718, M.E. 736 or M.E. 822. 560-862-0-0910

560 880. Advanced Fluid Mechanics. (3) On sufficient demand. Potential flow in three dimensions, vortex motion, the equations of viscous flow, hydrodynamic stability, turbulence. Three hours rec. a week. Pr.: M.E. 718 or M.E. 720, Math. 551. 560-880-0-0910

560 890. Laboratory Investigations in Mechanical Engineering. (Var.) I, II, S. Pr.: Approval of department head. 560-890-4-0910

560 898. Master's Report. (Var.) I, II, S. Topics selected with approval of major professor and department head. 560-898-4-0910

560 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. 560-899-4-0910

560 915. Gas Dynamics II. (3) I. An extension of Gas Dynamics I, with emphasis on two- and three-dimensional problems, shock waves. Three hours rec. a week. Pr.: M.E. 715. 560-915-0-0910

560 916. Advanced Topics in Mechanical Engineering. (Var.) I, II, S. A course reserved for study of current topics in mechanical engineering. Particular subject areas which may be included are: air conditioning, automatic controls, biomedical engineering, energy conversion, engineering design, environmental engineering, fluid and gas dynamics, heat transfer, kinematics, thermodynamics and vibrations. Topics announced when offered. Pr.: Consent of instructor. 560-916-0-0910

560 922. Advanced Air Conditioning. (3) I. Advanced psychrometric analysis; physiological factors; biotechnology and heat transfer. Three hours rec. a week. Pr.: M.E. 622. 560-922-0-0910

560 925. Advanced Machine Design. (Var.) On sufficient demand. At the option of the student this course may include a study of some advanced subject related to courses in this area. Pr.: Twelve hours of course work in this area. 560-925-0-0910

560 931. Boundary Layer Theory II. (3) On sufficient demand. Study of boundary layer transition; the development and solution of various turbulent boundary layer problems involving momentum, heat, and mass transfer and chemical reactions for compressible viscous fluid. Three hours rec. a week. Pr.: M.E. 831. 560-931-0-0910

560 935. Heat Conduction in Solids. (3) I. General differential equation of heat conduction and methods of solution for two-dimensional steady-rate transient heat flow, periodic heat flow, and internal heat sources. Three hours rec. a week. Pr.: M.E. 527. 560-935-0-0910

560 942. Convection Heat Transfer. (3) II. Energy and momentum equations in convective heat transfer, laminar and turbulent thermal boundary layers, steady and non-steady convection problems. Three hours rec. a week. Pr.: M.E. 527. 560-942-0-0910

560 943. Radiation Heat Transfer. (3) I, in odd 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 non-absorbing medium. Three hours rec. a week. Pr.: M.E. 527. 560-943-0-0910

560 965. Approximate Methods of Higher Analysis. (3) II, in alt. years. Approximate procedures for solving differential and integral equations encountered in engineering analysis; emphasis on continuous and discrete methods of approximation, convergence and error analysis. Three hours rec. a week. Pr.: Math. 622. 560-965-0-0910

560 999. Dissertation Research in Mechanical Engineering. Ph.D. level. (Var.) I, II, S. Pr.: Approval of department head and major professor. 560-999-4-0910

NUCLEAR ENGINEERING

N. Dean Eckhoff, Head of Department*

Professors Donnert,* Eckhoff,* Faw,* and Mingle;* Associate Professors Merklin,* Shultis,* and Simons;* Assistant Professors Hightower and Lester.*

The curriculum leading to the B.S. degree in nuclear engineering is designed to prepare students for professional positions in industry, government and private practice. Through technical electives, the student may organize a program suited to his particular needs and interests. For example, the student may elect a program leading to engineering practice with various specialties or to postgraduate study in engineering, science, medicine, or law.

As a profession, nuclear engineering requires understanding and competence in many and diverse disciplines. Hence, undergraduate nuclear engineering students at Kansas State University take engineering science courses in materials, thermodynamics, particle and continuum dynamics, electronics, circuit theory, and economics. With background established in these courses, able students will then be prepared for course work in the Department of Nuclear Engineering involving nuclear reactor design principles, neutron and charged particle interactions, radiation detection, radiation protection, radiation effects on materials, nuclear fuel management, industrial isotope applications, nuclear power cycle thermodynamics, nuclear power plant siting, and regulation and environmental impact assessment of nuclear power plants.

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: **250-kilowatt TRIGA Mark II Reactor** with pulsing capability to 250,000 kilowatts; **Radiation Shielding Facility** on a 180-acre remote site with a full scale house and other experimental shielding test structures, three Co-60 sources (5000 Ci, 250 Ci and 10 Ci); **Neutron Activation Analysis Laboratory** with three 4096-channel analyzers, gamma-ray spectrometers (GeLi, SiLi, and NaI), high speed printers, plotters and magnetic tape recorders; **Nuclear Instrumentation Laboratory** with lab stations containing digital logic training systems, instrumentation modules for pulse analysis and systems timing, dual-beam oscilloscopes, pulse and waveform generators; **Radioisotope Application Laboratory** with instructional equipment for radiation detection and analysis, neutron and beta radiography, material density and thickness gaging, mechanical wear studies, radioactive tracer techniques; **Shock-Tube Laboratory** with instrumentation for studies of combustion kinetics, molecular rate processes, and transient thermal and hydraulic phenomena; **Combustion Laboratory** with a completely instrumented plug-flow drop furnace capable of handling coal, agricultural residues, municipal wastes, or mixtures of various combustibles; **Environmental Monitoring Laboratory** with radiation survey meters, two thermoluminescent dosimetry systems, air samplers, Tri-Carb liquid scintillation spectrometer, and chemical separation facilities; **Radiation Effects and Fuel Processing Laboratory** with two gas chromatographs, an atomic absorption spectrometer, a Cary-14 spectrophotometer, a DU-spectrophotometer, a spinning band distillation

column, and a zone refiner; **Applied Optics Laboratory** with high-power argon ion laser and associated apparatus used in Doppler Velocimetry, Raman scattering and holographic inter-ferometry studies of heat, mass, and momentum transport phenomena. **Other:** pressurized water heat transfer loop, graphite subcritical pile, gamma irradiator (1,000 Ci), an auto- and cross-correlation noise analysis system, and three analog computers.

Courses in Nuclear Engineering

Undergraduate Credit

580 110. Nuclear Engineering Concepts. (2) I. This first course in nuclear engineering curriculum acquaints freshman students with the professional activities and responsibilities of nuclear engineers. It presents this information through lectures, recitations, and laboratory demonstrations. Two hours lec. a week. 580-110-0-0920

580 116. Nuclear Engineering Seminar. (1) II. Introduction to professional nuclear engineering. Student career planning. One hour rec. a week. 580-116-0-0920

580 315. Introduction to Nuclear Engineering Analysis. (3) II. Introduction to analytical, statistical, and numerical analysis as applied to nuclear engineering, including computer programming. Three hours rec. a week. 580-315-0-0920

580 325. Elements of Nuclear Engineering. (3) I, II. Nuclear reactions, nuclear energy releases, ionizing radiation, radiation attenuation; introduction to nuclear reactor concepts of criticality, multiplication factor, period, reactivity, neutron lifetime, fission product poisoning; introduction to reactor instrumentation and control, standards for protection against radiation, health physics, nuclear safety, licensing, survey and monitoring instrumentaion, instrument calibration, calculation of dose, dose rates, determination of maximum permissible concentrations and body burdens. Three hours lec. a week. Pr.: Math. 221, Phys. 213. 580-325-0-0920

580 410. Introduction to Nuclear Engineering. (3) I, II, S. A course to acquaint non-nuclear engineers with introductory aspects of nuclear engineering; a study of nuclear reactions, reactor core calculations, reactor safety and dynamics, shielding, fuels, waste disposal, electric power generation and radioisotope applications engineering. Three hours rec. a week. Pr.: Junior standing in engineering or consent of instructor. 580-410-0-0920

580 490. Neutron and Particle Interactions I. (2) I. Engineering approach to the classical mechanics of the interaction of neutrons and other radiation with matter; production and detection of neutrons and other types of nuclear radiation. Two hours rec. a week. Pr.: N.E. 325. 580-490-0-0920

Undergraduate And Graduate Credit In Minor Field

580 500. Applied Nuclear Engineering Analysis. (3) I. Methods and applications of analytical, statistical, and numerical analysis as applied to nuclear engineering including computer programming. Three hours rec. a week. Pr.: Junior standing in engineering. 580-500-0-0920

580 510. Neutron Activation Analysis. (3) II. Basic nuclear properties, neutron flux characteristics, nonreactor neutron sources, radio-chemical separations, radiation detectors and counting statistics, gamma-ray spectroscopy, analysis of gamma-ray spectroscopic data, case studies. Two hours rec. and three hours lab. a week. Pr.: Junior standing in engineering or physical science. 580-510-1-0920

580 511. Radioisotope Applications Engineering. (2) I, II. A laboratory course designed to familiarize the student with experimental parameters of importance in the design of engineering systems which make use of radioisotopes. Six hours of lab. per week. Pr.: N.E. 325 or N.E. 410. 580-511-1-0920

580 515. Nuclear Engineering Materials. (2) II. An investigation of the properties and behavior of structural materials, fuels, and components in nuclear radiation environments. Two hours lec. per week. Pr.: N.E. 325, Ch.E. 350 and Ch.E. 351. 580-515-0-0920

580 555. Nuclear Reactor Fundamentals. (3) I. Introduction to reactor cooling. Analysis of power cycles. Basic reactor thermal design. Three hours rec. a week. Pr.: N.E. 325, M.E. 571, M.E. 513. 580-555-0-0920

Undergraduate And Graduate Credit

580 613. Nuclear Fuel Cycle. (3) I. A course to familiarize the student with uranium conversion procedures, enrichment techniques, nuclear fuel burnup, spent fuel transport, reprocessing of spent fuel, fission product disposal methods, and economics of the nuclear fuel cycle. Three hours rec. per week. Pr.: N.E. 515. 580-613-0-0970

580 615. Nuclear Materials Control and Safeguards. (3) II. The management, control, measurement, accounting, and protection of nuclear fuel and strategic materials in the nuclear fuel cycle. Pr.: Senior or graduate standing in engineering, physical science, or business administration. 580-615-0-0920

580 620. 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. 580-620-3-0920

580 630. Applied Reactor Theory. (4) II. Theory of diffusion and slowing down of neutrons with application to critical and sub-critical nuclear reactors. Measurement of various reactor physics parameters. Three hours rec. and three hours lab. a week. Pr.: N.E. 490. 580-630-0-0920

580 635. 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. Cross listed with Phys. 635. Pr.: Phys. 532 or E.E. 557, and Phys. 621. 580-635-0-0920

580 640. Reactor Operations Planning. (2) I, II. Licensing, nuclear safety, and reactor operations. Measurement of nuclear reactor parameters. One hour lec. and three hours lab. a week. Pr. or conc.: N.E. 655. 580-640-0-0920

580 650. Environmental Radiation. (3) I. Radionuclides and ionizing radiation in the environment of natural and artificial origin. Biological effects of radiation. Detection and measurement of environmental radiation. Licensing and regulation pertaining to environmental radiation. Pr.: N.E. 325 or N.E. 410 or consent of instructor. 580-650-0-0920

580 655. Radiation Protection Engineering. (3) I. Principles of radiation protection. Radiation shielding, radiation dosimetry, and administrative aspects of radiation protection. Special applications in nuclear plant design, fuel transportation, and fuel reprocessing. Three hours rec. a week. Pr.: N.E. 325, N.E. 511 or consent of instructor. 580-655-0-0970

580 675. 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.: N.E. 490, N.E. 500. 580-675-0-0920

580 692. Nuclear Reactor Technology. (3) II. Thermal and neutronic design analysis of nuclear reactors. Nuclear quality assurance. Safety analysis reports. Three hours rec. a week. Pr.: N.E. 555, N.E. 630. 580-692-0-0920

580 695. Nuclear Reactor Laboratory. (1) I, II. Experimental investigation of thermal and hydraulic characteristics of nuclear reactors. Three hours lab. a week. Pr. or conc.: N.E. 692. 580-695-1-0920

580 699. Constructive Uses of Nuclear Explosives. (3) II. Characteristics and effects of nuclear explosives; Plowshare tests; industrial uses of nuclear explosives; scientific applications of nuclear explosions. Pr.: N.E. 630, N.E. 490 or consent of instructor. 580-699-0-0920

580 708. Nuclear Fuel Processing Laboratory. (1) I. Experimental investigation of the methods and principles of separation and purification as they apply to the production and recovery of nuclear fuel and materials. Three hours lab. a week. Pr.: N.E. 515. 580-708-1-0920

580 715. Radiation Shielding. (3) II. Introduction to important sources of radiation, kernel concepts, and application of diffusion and ray theory to shielding calculations, applications principally in the field of stationary nuclear reactor shielding. Three hours rec. a week. Pr.: N.E. 630. 580-715-0-0920

580 720. Nuclear Systems Analysis. (3) II. Introduction to nuclear reactor kinetics and simulation. Linear stability of reactor systems. Noise analysis. Application of hybrid computers to nuclear systems analysis. Three hours rec. per week. Pr.: N.E. 630. 580-720-0-0920

580 750. Direct Energy Conversion. (3) II. Principles and analysis of direct conversion phenomena, with special emphasis on direct conversion of nuclear energy including thermoelectric, thermionic, photovoltaic, magnetohydrodynamic and electrochemical processes. Three hours rec. a week. Pr.: N.E. 555. 580-750-0-0920.

580 761. Radiation Detection and Measurement. (4) I. Theory of detection of nuclear radiation. Measurement devices and systems. Applications to radiation dosimetry and spectroscopy, and instrumentation systems for nuclear reactors. Three hours rec. and three hours lab. per week. Pr.: N.E. 511. 580-761-0-0920

580 762. 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. per week. Pr.: E.E. 511 or 526. 580-762-1-0920

580 772. 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. per week. Pr.: N.E. 490. 580-772-0-0920

580 774. 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.: N.E. 490 or Chem. 595. 580-774-0-0920

580 791. Controlled Thermonuclear Reactions I. (3) II. Principles of controlled thermonuclear processes; fuel cycles; energy-balance considerations; magnetic and inertial confinement; plasma instabilities; plasma heating; neutronics; radiation damage and materials problems; design of experimental power reactors and power-reactor systems. Three hours rec. a week. Pr.: N.E. 490, and N.E. 635 or Phys. 635. 580-791-0-0920

580 795. Separation of Nuclear Fuels. (4) II. A graduate level course investigating the chemical properties, the methods of separation, purification and reprocessing of uranium, thorium and plutonium. Three hours rec. and three hours lab. a week. Pr.: N.E. 613 or Ch.E. 560 (Cross-listed with chemical engineering, Ch.E. 795). 580-795-1-0970

Graduate Credit

580 806. Neutronics I. (3) I. Particle transport, theories of diffusion, numerical analysis of diffusion, transient core analysis. Three hours rec. a week. Pr.: N.E. 630. 580-806-0-0920

580 808. Neutronics II. (3) II. Perturbation theory, core neutronic design, spatially dependent kinetics, reactor control. Three hours rec. a week. Pr.: N.E. 806. 580-808-0-0920

580 810. 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. 580-810-4-0920

580 847. Nuclear Power Engineering I. (3) I. Principles of hydraulic and thermal analysis for nuclear power reactors. Advanced core design. Three hours rec. a week. Pr.: N.E. 692. 580-847-0-0920

580 851. Nuclear Engineering Laboratory. (2) I. Reactor kinetics, reactor noise analysis determinations of B/l, reactor power calibration, auto and cross-correlation techniques, pulsed neutron measurement, radiation shielding, radiation effects, activation analysis, neutron diffraction, and heat transfer. Six hours lab. a week. Pr. or conc.: N.E. 806. 580-851-1-0920

580 860. Advanced Topics in Nuclear Engineering. (Var.) I, II, S. A presentation of various special topics covering advanced nuclear engineering specialities. Pr.: Graduate standing and consent of head of department. 580-860-0-0920

580 865. Numerical Engineering Analysis. (3) I. Engineering analysis approached from the viewpoint of those numerical analysis procedures especially useful with large capacity computer facilities. Three hours rec. per week. Pr.: G.E. 740 or Math. 761. 580-865-0-0920

580 890. 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. 580-890-0-0920

580 899. Master's Thesis. (Var.) I, II, S. Topics selected with approval of major professor and department head. 580-899-4-0920

580 925. Transport Theory I. (3) I. Principles of transport theory, approximation theory, numerical transport algorithms, gamma ray transport. Three hours rec. a week. Pr.: N.E. 806. 580-925-0-0920

580 926. Transport Theory II. (3) II. Advanced approximation theories, transport code development. Three hours rec. a week. Pr.: N.E. 925. 580-926-0-0920

580 947. Nuclear Power Engineering II. (3) II. Nuclear system analysis and design with computational considerations. System safety analysis. Three hours rec. a week. Pr.: N.E. 847. 580-947-0-0920

580 955. Computational Methods in Nuclear Engineering. (3) II. An analysis of the algorithms utilized in nuclear engineering computations; requirements of generalized computational programs, design of a typical program. Three hours rec. a week. Pr.: N.E. 806, N.E. 847. 580-955-0-0920

580 970. The Interaction of Radiation with Matter. (3) II. Classical and quantum theories of the interaction of radiation with matter. Energy and charge transfer processes. Applications to nuclear reactor theory, radiation shielding, and nuclear instrumentation. Three hours rec. per week. Pr.: N.E. 675. 580-970-0-0920

580 991. Controlled Thermonuclear Reactions II. (3) I. Continuation of N.E. 791. Collisionless plasmas; theory of plasma waves and instabilities; plasma diagnostics, experimental approaches. Other topics of current interest. Three hours rec. a week. Pr.: N.E. 791. 580-991-0-0920

580 999. Dissertation Research. (Var.) I, II, S. Topics selected with approval of major professor and department head. 580-999-4-0920

ENGINEERING EXPERIMENT STATION

Teddy O. Hodges, 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. The Experiment Station is the division of the college responsible for the administration of research.

The Experiment Station was established March 10, 1910 by the Board of Regents for the purpose of performing research of engineering and manufacturing value to the State of Kansas, and for collecting and presenting technical information for the use of industry and the people of the state. While the Experiment Station still functions to meet the obligations of its original charge, its activities have expanded to include research of national and international significance. This, of course, is consistent with the interdependence of people at all governmental levels, including community, state, national, and world.

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 about 2 million dollars, with approximately 27 percent appropriated by the state and the remainder from other sources. Research now being carried on includes:

Structural characteristics of concrete panels and of beams with web openings.
Waste disposal and energy generation from wastes.
Food science and grain processing.
Electromagnetic wave propagation.
Evaluation of information concerning resources from earth satellites.
Positive aspects of nuclear energy including studies of radiation effects of materials, the production of new materials and analysis.
Concrete pavement surface failures and methods of preventing them.
Application of integrated circuits to problem solution.
Air and water pollution control.
Water use efficiency.
Wind and solar energy.
Heat, mass and momentum transfer.
Effects of environmental factors on human work performance and health.
Systems engineering.
Bioengineering.
Gasification and liquefaction of coal and wastes.
Transportation engineering.
Materials science.

INSTITUTE FOR ENVIRONMENTAL RESEARCH

Frederick H. Rohles, Jr., Director

Objectives

1. Provide a focal point for interdisciplinary research relevant to the effect of normal and altered environments on man including living and working conditions under the ocean and in space.

2. Determine response of human and other organisms to environmental factors affecting health, comfort, affectivity, productivity and learning, including—but not limited to—thermal factors, air composition, sound, light, color, and spatial relationships.

3. Investigate methods of environmental control and modification including cost studies for optimum system performance and energy conservation.

4. Provide opportunities and facilities for M.S. and Ph.D. research projects and specialized graduate level courses and seminars.

5. Collect and disseminate data and provide research and service to industry and governmental agencies interested in environmental problems.

Organization

The Institute for Environmental Research is organized to provide opportunities and facilities for research into man's relation and response to environmental factors. University staff and graduate students carry out projects and research using the facilities of the institute and with the assistance of its staff. The institute is under the dean of the College of Engineering, and its research is administered through the Engineering Experiment Station.

The institute is composed of a director, an executive council, research associates from the university faculty, graduate research assistants, technicians and clerical workers. The executive council is an interdisciplinary group appointed from members of the participating staff and directors which formulates policy procedures, initiates and directs research, and advises faculty and graduate students who associate with the institute for special projects. The research associates are also members of their respective major departments throughout the University and members of the graduate faculty.

Interested faculty from the areas of mechanical, electrical, chemical and industrial engineering, psychology, physiological sciences, architecture, family and child development, clothing, textiles and interior design, foods and nutrition, grain science and industries, infectious diseases, pathology, statistics, and education are research associates of the institute staff. The institute is organized so faculty members or students from any department can carry out research in the institute within its stated objectives.

INSTITUTE FOR SYSTEMS DESIGN AND OPTIMIZATION

L.T. Fan, Director
F.A. Tillman, Associate Director

The Institute for Systems Design and Optimization at Kansas State University, to promote 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 Kansas State University in the area of 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, 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 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

J.O. Mingle, Director
H.S. Walker, Associate Director

The Institute for Computational Research in Engineering 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 ENGINEERING SHIELDING FACILITY

Richard E. Faw, Director

Through the Department of Nuclear Engineering, Kansas State University operates a 180-acre radiation shielding test site for large-scale experimental work in radiation shielding and related areas. Research facilities at the test site include full-scale as well as scale-model buildings for experimental studies in structure shielding. A wide variety of nuclear instrumentation and calibration installations are available. In addition to its use in research, the test site is used during nuclear engineering department summer institutes in such areas as industrial radiography and nuclear defense design.

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 non-destructive 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

William H. Honstead, Director

The Kansas Industrial Extension Service uses the facilities of the College of Engineering to assist Kansas manufacturing industries. Information, technical assistance, and continuing education are the areas of activity through which the Extension Service functions. The Farrell Library on the campus, the Linda Hall Library in Kansas City, and other informational sources can be utilized. The laboratory 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 engineers and manufacturing personnel.

To use the service, write or call Kansas Industrial Extension Service, 150 Seaton Hall, Kansas State University, Manhattan, Kansas 66506, 913-532-5720.



College of Home Economics

Ruth Hoeflin, Dean*
Jean Sego, Assistant to the Dean
Karen Pence, Instructor
Les D. Streit, Instructor

K-State offered the first home economics course in the U.S. for college credit in 1873. This great heritage has served as a basis for dynamic and innovative home economics programs in higher education. Today, the College of Home Economics at Kansas State University is recognized as one of the largest and most progressive institutions for the education of professional home economists in the United States.

Home economics at Kansas State University is an exciting and challenging educational experience. Students learn creative solutions and approaches to meet the needs of people, now and in the future. The uniqueness of home economics involves the integration of knowledge gained from the basic liberal arts as applied in courses that focus on the home, family, and quality of living for each individual.

The College of Home Economics participates in the Intercollegiate Program in Women's Studies, page 43.

An Undergraduate Degree In Home Economics

Programs of study leading to the Bachelor of Science degree are offered within the five curricula in the College of Home Economics. These curricula are designed to interest students with varying academic and professional objectives. The curricula and options are listed and described on the following pages.

1. Curriculum in home economics with options
   - Fashion Marketing
   - Textile Science
   - Fashion Design
   - Interior Design
   - Family Life and Human Development
   - Early Childhood Education
   - Consumer Affairs
   - Housing and Equipment
   - Foods and Nutrition in Business—Community Service
   - Foods and Nutrition Science
   - Dietetics Restaurant and Institutional Management
   - Home Economics Education—Vocational Teaching
   - Home Economics Extension
   - General Home Economics
2. Curriculum in home economics and mass communications (journalism, radio and television)
3. Curriculum in home economics with liberal arts
4. Curriculum in restaurant management
5. Curriculum in food science and industry (offered jointly with College of Agriculture)

Entering students who are undecided about a specific major may enroll in general home economics. Students in this area may take courses from all fields of general education and home economics. The program allows time for students to consider the many possibilities available before they make the final decision of a college major. Special advisers work with these students to select courses that will later apply to almost any curriculum at Kansas State University.

Field Study Opportunities

Each department in the College of Home Economics offers field study experience for interested and qualified students. They earn University credit and gain valuable on-the-job experience in a variety of locations. Guidance and supervision for these programs come from University faculty in cooperation with professionals in the field. The length of time devoted to a field study experience may vary from one or two weeks to a complete semester. Students may earn some salary on certain work-study programs.

Examples of field study opportunities include: a six to eight week internship in a retail store for students majoring in fashion marketing. The interior design field experience may be done in locations where students can gain business and customer experiences in the design and merchandising of interiors and furnishings. Students in family and child development gain teaching experience by participating in a fully-equipped child development laboratory or the infant and child-care centers located on campus and by working in child care centers in urban settings. Students who have chosen to concentrate in the community services area live in Wichita for one semester and are involved in private and public agencies concerned with families, youth, and children. Agencies include: Mid-American All Indian Center, Neighborhood Youth Corps, Elks Training Center, Store Front Counseling Center, Sedgwick County Mental Health Center, Community Action Program, and the American Red Cross. Family economics students work with individuals and families in financial counseling, coordinated with the Army Community Services at nearby Fort Riley. Through the Consumer Relations Board on campus and the Manhattan Consumer-Business Relations Center, students gain experience in handling consumer complaints and working with business. A foods and nutrition practicum is available for students to gain experience in the business field or in community nutrition and public health. Students in dietetics have extensive field work through clinical and administrative experiences at the University of Kansas Medical Center and in Wichita hospitals and health care facilities. Foodservice centers on campus and in business establishments provide on-the-job training for those in restaurant management.

The Merrill-Palmer Program

Selected undergraduate and graduate students may attend Merrill-Palmer Institute of Human Development and Family Life for one semester. This program provides course and field study in the metropolitan setting of Detroit, Michigan. All plans must be approved in advance by the dean of the College of Home Economics.

Dual Degree Programs

The College of Home Economics offers a special dual degree program with the College of Arts and Sciences in the area of social work. Students may major in either family and child development or consumer affairs combined with social work. This special program of 135 credit hours results in both a degree in home economics and one in arts and sciences. See page 289 for required courses.

There are many other possible combinations for dual degrees under the usual University policy of at least 30 additional hours beyond the number required for the first degree. Questions should be referred to the dean's office faculty.

Honors Program And Advanced Degree Program

Students with outstanding academic records are invited to participate in the home economics honors program. High school students are selected according to their rank in the upper percent of their class and scores on the American College Test. Transfer students and upperclassmen with a 3.5 cumulative grade point average who are recommended by faculty members also are eligible. Special advisers help honor students plan their individual programs of study which include honors courses, seminars, and independent study.

The home economics advanced degree program is for outstanding students with demonstrated ability for graduate work. Students with a "B" average or better their first semester on campus are invited to join. Selected members of the graduate faculty advise those who choose to participate. The student and graduate faculty adviser plan educational experiences that can lead to a graduate program in the area of the student's choice.

Women's Studies Program

The College of Home Economics participates in the Intercollegiate Program in Women's Studies. See page 43 for details.

Organizations And Activities

Students participate in a wide range of professional and honorary societies sponsored by local and national organizations. The K-State student member section of the American Home Economics Association, available to all students majoring in home economics, encourages leadership and professional development.

Qualified students are invited to join the home economics honoraries, Phi Upsilon Omicron and Omicron Nu, as well as the honors program. They also may be elected to serve as representatives of the Home Economics Council, the official home economics student governing body, or all may participate in Hospitality Day, an annual open house in the College of Home Economics.

Placement

Employment is extremely high for home economics graduates. A survey conducted in October of 1977 found 87% of the May, 1977 home

economics graduates with a bachelor's degree employed. Almost one-half of these graduates were earning over $7,500 in the areas of business, education, government and community services. An advanced degree in home economics expands career opportunities. The demand for home economists with the M.S. or Ph.D. degree, far exceeds the available supply. Salary levels for those with an advanced degree is commensurate with prior experience. For example graduates with the master's degree receive salary offers over $15,000.

Graduate Study Opportunities

The College of Home Economics offers excellent opportunities for graduate study for the student who wishes to continue beyond the Bachelor of Science degree. All departments in the College of Home Economics, as well as general home economics and home economics education, offer the Master of Science degree. Two Doctor of Philosophy degrees are available: one in foods and nutrition and an interdepartmental one that includes areas of emphasis in clothing, textiles and interior design; family and child development; family economics; or institutional management (refer to page 41).

Graduate research and teaching assistantships are available to qualified students. Application forms and additional information can be obtained from the dean, College of Home Economics, Justin Hall, Kansas State University, Manhattan, Kansas 66506.

Transfer Students

Careful planning enables a student to transfer without loss of credit. A student who plans to transfer for the junior year should write for suggestions or preferably come to the KSU campus for a conference before beginning the sophomore year. The courses listed below can be transferred to the College of Home Economics, although not all courses are required for every major. A list of required courses for each major is available from the home economics dean's office.

Courses Required In All Home Economics Majors:	**Credit Hours***
English Composition	6
Speech	2
General Psychology	3
Economics	3
Transferable Courses; some may apply as electives if not required for specific major:	
American Government or Political Science	3-6
Sociology	3-6
Civilization or World History	3-6
Literature or Modern Language	6
Art Appreciation	3
Design I	2
Drawing I	2
College Algebra	3
General Chemistry**	5
Organic Chemistry	5
Biology (with lab)	4
Human Growth and Development	3
Meal Management	3
Nutrition***	3
Socio-economics of Clothing	3
Clothing Construction	3
Family Relations****	3
Child Development	3
Textiles	3

*Credit hours given above apply to courses at KSU. Some transfer courses have more or fewer hours, substitutions or readjustments usually can be made for the difference in credit hours. Up to 62 hours may be transferred from a two-year college. 125 hours are required for graduation from the KSU College of Home Economics.

**Many home economics majors do not specifically require chemistry to fulfill the physical science requirement. Write for a list of required courses for major area of interest.

***Students planning to major in foods and nutrition, dietetics, or home economics education should take Principles of Nutrition after transferring to KSU.

****Must be offered through Home Economics Department for students majoring in Home Economics Education.

Curriculum In Home Economics With Options

B.S. In Home Economics

This curriculum consists of a wide choice of options from which a student may select a major. All options consist of the following: (1) a broad general education that includes courses from the humanities, social, biological and physical sciences; (2) a home economics core that is a small group of home economics courses planned to introduce students to the total profession; (3) an area of specialization, to give the student the opportunity to develop interest and ability in a specific field of home economics; and (4) unrestricted electives that permit students to take courses in any KSU department.

Liberal-General Education Courses, 34 Hours

Communications, 8 Hours			
English	229 100	English Composition I	3
English	229 120	English Composition II	3
Speech	281 105	Oral Communication I	2
Social Science, 6 Hours			
Economics	225 110	Economics I	3
Psychology	273 110	General Psychology	3

Additional Requirements, 20 Hours

Four disciplines of humanities, social, biological, and physical sciences shall be represented in liberal-general education and/or supporting courses. (One discipline, not represented in supporting courses, shall include 8-12 credit hours, with two courses in sequence plus one additional course.)

Home Economics Core, 14-15 Hours*

I. Des.	611 101	Design for Contemp. Living	3
F.C.D.	620 230	Intro. Human Development	3
		OR	
F.C.D.	620 272	The Helping Relationship	3
		OR	
F.C.D.	620 310	The Preschool Child	3
		OR	
F.C.D.	620 350	Family Relationships	3
F. Ec.	630 400	Family Economics	3
F.&N.	640 132	Basic Nutrition	3
		OR	
F.&N.	640 133	Food for Man	3
		OR	
F.&N.	640 301	Trends in Food Products	3
Gen. H.E.	650 120	Dimensions of Home Ec.	1-2
Gen. H.E.	650 400	Home Ec. Seminar	1

Professional and Supporting Courses, 43-74 Hours

(See specific option)

Unrestricted Electives, 0 to 25 Hours

Other

Concepts in Phys. Ed.	1
Total for Graduation	125

*Not required in Home Economics Education

Cooperative Extension Service

The Cooperative Extension Service, with educational programs designed to improve the quality of life of individuals and families and to improve communities, is an integral part of the Land-Grant Institution. The extension service provides professional opportunities for home economics graduates in home economics-family living programs and 4-H youth programs.

State extension services need personnel with different kinds of competencies. Some positions in extension home economics require that the individual have a broad background in all subject-matter areas of home economics. Some require that the individual be specialized in one or more closely related home economics subject-matter areas. Course work in educational program development and teaching-learning methods and procedures is desirable.

A student interested in a position with the Cooperative Extension Service may wish to confer with a county, area, or state extension employee to learn about job responsibilities.

Option in Home Economics Extension

Department of General Home Economics

This option prepares a student to become a county extension home economist. On graduation the student is prepared to join the Cooperative Extension Service for work in a county in Kansas or another state.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Biol.	215 198	Prin. Biology	4
Chem.	221 110	Gen. Chemistry	5
Chem.	221 190	Elem. Organic Chem. WITH	3
Chem.	221 191	Elem. Organic Chem. Lab. OR	2
Biochem.	211 120	Intro. Organic & Biochem.	5
Soc.	277 211	Intro. to Sociology	3

Professional and Supporting Courses

Art	209 100	Oesign I	2
A.&O.	410 605	Ext. Organ. & Prog.	3
A.&O.	410 752	Prin. Teach. Adults in Ext.	3
C.&T.	610 150	Prin. Cloth. Const.	3
C.&T.	610 260	Textiles	3
I.Oes.	611 240	Interior Oesign Studio I	3
F.C. Oev.	620 230	Intro. to Human Oevelopment*	3
F.C. Oev.	620 310	The Preschool Child*	3
F.C. Oev.	620 350	Family Relationships*	3
F.C. Oev.	620 650	The Family	2-3
F.Ec.	630 460	Family Resource Mgmt. Theory & Appl.	2
F.Ec	630 420	Housing	3
F.Ec.	630 440	Household Equipment OR	3
F.Ec.	630 630	Household Equipment Theory	2-3
F.&N.	640 300	Meal Management	3
F.&N.	640 601	Food Science	3
F.&N.	640 602	Prin. Nutrition	3
		Communications Elective	2-3

Select 6-7 hours from the following:

A.&O.	410 636	Pract. in Exten. Education	5
F.C. Oev.	620 352	Concepts of Family Health	3
F.Ec.	630 405	Family Finance or other approved home economics courses	3

Unrestricted Electives 12-19

*If not taken in Home Economics core.

Option in Home Economics Education—Vocational Teaching

This option prepares the student for teaching home economics in Kansas secondary schools. With a B.S. degree, the student is eligible for a secondary three-year certificate to teach home economics in any Kansas junior or senior high school and with the approval to teach in a vocational homemaking department.

Refer to pages 209-213 for admission requirements to teacher education and the professional semester.

Option requirements in addition to courses in basic curriculum:*

Liberal-General Education Courses

Art	209 100	Oesign I	2
Biol.	215 198	Prin. Biology	4
Chem.	221 110	Gen. Chemistry	5
Chem.	221 190	Elem. Organic Chem. WITH	3
Chem.	221 191	Elem. Organic Chem. Lab. OR	2
Biochem.	211 120	Intro. Organic & Biochem.	5
Pol. Sci.	269 110	Prin. Pol. Science OR	3
Pol. Sci.	269 325	U.S. Politics	3
Soc.	277 211	Intro. to Sociology	3
		Literature or Language	6
		Social Science Elective	3
		Liberal-General Educ. Electives	5

Professional Courses

A.&F.	405 215	Educ. Psych. I	3
A.&F.	405 315	Educ. Psych. II	3
A.&O.	410 586	Teaching Part. Sec. School	8
A.&O.	410 550	Methods of Teaching Home Ec.	2
A.&O.	410 610	Occup. Home Econ.	2
A.&O.	410 620	Principles and Philosophy of Vocational Education	3
A.&O.	410 621	Program Planning in Vocational Education	3
A.&O.	410 637	Practica in Home Economics Related Occupations	1-3
A.&O.	410 639	Coordination of Coop. Voc. Educ.**	2
A.&O.	410 713	Occupational Analysis**	2
C.&I.	415 316	Intro. to Instr. Media	1
C.&T.	610 150	Prin. Clothing Const.	3
C.&T.	610 260	Textiles	3
I. Oes.	611 240	Int. Oesign Studio I	3
F.C. Oev.	620 310	Preschool Child	3
F.C. Oev.	620 311	Preschool Child Lab.	1
F.C. Oev.	620 350	Family Relations	3
F.C. Oev.	620 520	The Adolescent	2
F.C. Oev.	620 521	The Adolescent Lab.	1
F.Ec.	630 400	Family Economics	3
F.Ec.	630 420	Housing	3
F.Ec.	630 440	Household Equipment OR	3
F.Ec.	630 630	Household Equipment Theory	3
F.Ec.	630 460	Family Resource Mgmt. Theory & Appl.	2
F.Ec.	630 465	Home Management Lab.	2
F.&N.	640 300	Meal Management	3
F.&N.	640 601	Food Science	4
F.&N.	640 602	Principles of Nutrition	3

Unrestricted Electives 0-6

*Home Economics Core not required.

**These courses may be taken for graduate or undergraduate credit. If taken for graduate credit, the student is required to complete 125 undergraduate hours for the B.S. degree.

Curriculum In Home Economics And Mass Communications

B.S. in Home Economics and Mass Communications

This curriculum provides for a specialization in either the print media or broadcast media. Students take courses in journalism, radio and television to

prepare for careers with newspapers, magazines, radio-television, and in public relations and promotion with business and industry or government. A home economics background, plus courses in mass communications, gives graduates in this curriculum a broad base when making a career decision.

Liberal-General Education Courses, 34 Hours

Communications			8
English	229 100	English Composition I	3
English	229 120	English Composition II	3
Speech	281 105	Oral Communication I	2
Social Science*			12-15
Econ.	225 110	Economics I	3
Pol. Sci.	269 110	Prin. Pol. Sci.	3
		OR	
Pol. Sci.	269 225	U.S. Politics	3
Psych	273 110	General Psychology	3
Soc.	277 211	Intro. to Sociology	3

Biological Science*
Physical Science*
Humanities*

*At least 26 hours among the starred disciplines with one course in each area; and in one area, two courses in sequence plus one other course.

Home Economics Core (14-15 Hours)

I. Des.	611 101	Design for Contemp. Living	3
F.C. Dev	620 310	The Preschool Child	3
		OR	
F.C. Dev.	620 230	Intro. Human Develop.	3
		OR	
F.C. Dev.	620 272	The Helping Relationship	3
		OR	
F.C. Dev	620 350	Family Relationships	3
F.Ec.	630 400	Family Economics	3
F.&N	640 132	Basic Nutrition	3
		OR	
F.&N.	640 133	Food for Man	3
		OR	
F.&N.	640 301	Trends in Food Products	3
General H.E.	650 120	Dimensions of Home Ec.	1-2
General H.E.	650 400	Home Ec. Seminar	1

Professional and Supporting Courses, 61-70 Hours

Home Economics Courses,* 22-26 Hours
Area of Concentration (14-16)

Courses selected from at least one area other than concentration (8-10)

Basic Disciplines, Business Admin., and/or Education,* 9-10 Hours
Courses selected to support home economics areas

SELECT AREA "A" OR "B"

A. **Print Media Emphasis** (30-34 Hours)

JMC	289 275	Reporting I	3
JMC	289 285	Reporting II	3
JMC	289 330	Editing I	3
JMC	289 525	Jism. for Mod. Living	3

Professional Electives in Journalism and Mass Communications* 18-22

B. **Broadcast Media Emphasis** (31-34 Hours)

JMC	290 240	Fund. of R-TV Prod.	3
JMC	290 250	Fund. of R-TV Perf.	3
JMC	290 260	R-TV Continuity	3
JMC	289 275	Reporting I	3
JMC	290 330	Reporting II (R-TV)	3

Remaining 16-19 hours selected from the following course groupings in consultation with adviser.

Group I (4-7 Hours)
(Students may take not more than four hours of participation courses and not more than three hours in either course.)

JMC	290 355	KSDB-FM Participation	1
JMC	290 375	Cable TV Participation	1
JMC	290 640	Advanced Radio Prod.	3
JMC	290 650	Advanced TV Prod.	3

Group II (3-9 Hours)

JMC	290 660	History of Broadcasting	3
JMC	290 665	R-TV Regulation and Responsibility	3
JMC	290 630	R-TV Programming	3
JMC	290 685	R-TV Management	3

Group III (3-9 Hours)

JMC	290 675	R-TV Criticism	3
JMC	290 610	R-TV Drama Writing	3
JMC	290 615	R-TV Series Writing	3
JMC	290 620	R-TV Advertising	3

Unrestricted Electives, 5-15 Hours

Other

Concepts in Phys. Ed.	1
Total for Graduation	125

*Selected in consultation with Home Economics faculty adviser.

Curriculum In Home Economics With Liberal Arts

B.S. in Home Economics

This curriculum is for the student who wishes to combine a broad liberal arts education with home economics. Maximum flexibility is provided for the selection of courses best suited to individual abilities and interests. The student in consultation with a faculty adviser selects a sequence of courses for concentration in one or more academic areas. This curriculum provides excellent background for professional careers, graduate study, and the responsibilities of homemaking and citizenship.

Liberal-General Education Courses, 65-68 Hours

Communications			8
English	229 100	English Composition I	3
English	229 120	English Composition II	3
Speech	281 105	Oral Communication I	2
Social Science			12
Economics	225 110	Economics I	3
Psychology	273 110	General Psychology	3
		Electives in Soc. Sci.	6
Humanities			17-18
Philosophy, Mathematics, Logic			3
Literature or History			6
Electives in Humanities			8-9
Physical Science			8-10
Biological Science			8
Concentration in one subject matter area			12

Home Economics, 34-35 Hours

I. Des.	611 101	Design for Contemp. Living	3
F.C. Dev.	620 310	The Preschool Child	3
		OR	
F.C. Dev.	620 230	Intro. Human Development	3
		OR	
F.C. Dev.	620 272	The Helping Relationship	3
		OR	
F.C. Dev.	620 350	Family Relationships	3
F. Ec.	630 400	Family Economics	3
F.&N.	640 132	Basic Nutrition	3
		OR	
F.&N.	640 133	Food for Man	3
		OR	
F.&N.	640 301	Trends in Food Products	3
General H.E.	650 120	Dimensions of Home Ec.	1-2
General H.E.	650 400	Home Economics Seminar	1

Courses in home economics in one of the following areas of concentration 20

a. Clothing, textiles, and interior design. C. & T. 131 (3), C. & T. 260 (3), courses in fashion and interior design, construction and related areas in home economics (14).

b. Family and child development: F.C. Dev. 310 (3), F.C. Dev. 350 (3), F.C. Dev. 650 (3), courses in Family and Child Development and related areas in home economics (12).

c. Family economics: F. Ec. 405 (3), F. Ec. 460 (2), F. Ec. 605 (3), courses in family economics and related areas in home economics (12).

d. General home economics: F. & N. 132 (3), F. Ec. 460 (2), F.C. Dev. 310 (3) and selected home economics courses (12).

Unrestricted Electives, 21-25 Hours

Other

Concepts in Phys. Ed.	1
Total for Graduation	125

General Home Economics

Ruth Hoeflin, Head of Department*

Professor Hoeflin;* Instructors Pence and Sego. Emeritus: Professor Kramer;* Assistant Professor Barnes.*

Courses in General Home Economics

Undergraduate Credit

650 120. Dimensions of Home Economics. (1-2) I. Historical development, philosophy, scope, and career choices. Includes use of computer based system for home economics educational plan. 650-120-0-1301

650 208. Home Economics Colloquium. (Var.) I, II, S. Special topics for home economics majors. 650-208-2-1301

650 385. Problem in General Home Economics. (Var.) I, II, S. Independent study. Pr.: Consent of instructor. 650-385-3-1301

650 399. Honors Seminar in Home Economics. (1) I, II. Selected topics in home economics. May be taken more than once for credit. For students in honors program only. 650-399-0-1301

650 400. Home Economics Seminar. (1) I, II. Current issues, professionalism and place of research in home economics. Pr.: Senior standing or consent of instructor. 650-400-0-1301

Undergraduate And Graduate Credit

650 780. Problem in General Home Economics. (Var.) I, II, S. Individual investigation into work in area of general home economics. Pr.: Consent of instructor. 650-780-3-1301

Graduate Credit

650 800. Methods of Research in Home Economics. (2) I, S. Fundamental procedures for research; meaning and organization of research from conception through publication. 650-800-0-1301

650 850. Home Economists in Rehabilitation. (1-6) I, II, S. Current status, literature, and research on rehabilitation programs for the handicapped. Pr.: 15 credit hours in 400-700 level home economics courses. 650-850-0-1301

650 851. Field Study in Rehabilitation. (6-12) I, II, S. Supervised professional experience in a rehabilitation agency or community program as a member of the rehabilitation team. Pr.: General H.E. 850. 650-851-2-1301

650 860. Contemporary Topics in Home Economics. (1-4) I, II, S. Selected topics in home economics. May be taken more than once with consent of graduate committee. Pr.: Eight hours graduate level home economics courses. 650-860-2-1301

650 865. Field Study in Home Economics. (1-6) II. Supervised professional home economics experiences. May be taken more than one semester. Pr.: General H.E. 860 or consent of instructor. 650-865-2-1301

650 880. Seminar in Home Economics. (1-3) I, II, S. Current research and trends in home economics. May be taken more than once for credit. Pr.: Consent of instructor. 650-880-0-1301

650 899. Research in General Home Economics. (Var.) I, II, S. Individual research problems. Pr.: Consent of instructor. 650-899-4-1301

650 980. Interdisciplinary Home Economics Seminar. (3) I, II, S. Current research, topics and issues relevant to the home economics profession. Pr.: Enrollment in the Ph.D program in home economics. 650-980-0-1301

Graduate Programs in General Home Economics

Graduate study leading to the degree Master of Science is offered in general home economics in combination with two or three related areas. Either the thesis, report, or course-work only plan may be selected for a program of study. The area of general home economics participates in the graduate program for the Ph.D. in home economics. Prerequisites for graduate work include a background in home economics or related areas and admission to Graduate School. The dean of the College of Home Economics serves as an adviser.

Home Economics Education. The College of Home Economics and the College of Education have a cooperative arrangement so that a student who wishes a minor or major in home economics education may plan a graduate program of study to include one or more areas in home economics with emphasis in one area. A student may choose one of three options for a master's degree: (1) thesis, (2) report, or (3) non-thesis or report plan based on course work. Prerequisites for graduate work include admission to Graduate School and a background in home economics and education courses as required for undergraduate students majoring in home economics education. Home economics education courses are listed on page 273. Graduate faculty members in home economics education serve as major advisers.

Departments & Course Offerings

CLOTHING, TEXTILES, AND INTERIOR DESIGN

Mary Don Peterson, Acting Head of Department

Assistant Professors Newby, Peterson, Reagan,* Stolper,* and Villasi;* Instructors Barnhart, Crews, Helvenston, Kruckeberg, Munson, Ordonez, and Varney. Emeritus: Professors Barfoot* and Brockman;* Associate Professors Cormany,* Hill,* Howe,* and Lienkaemper;* Assistant Professor Craigie.*

The Department of Clothing, Textiles and Interior Design offers opportunities for study in socio-economics of clothing, textile science, clothing construction, fashion merchandising, history of costume, and design of interiors. Four options leading to a Bachelor of Science degree are: (1) fashion marketing, (2) fashion design, (3) textile science, and (4) interior design. Major sequences leading to the Master of Science degree in the field of clothing, textiles and interior design may be selected according to the individual's choice.

Facilities include an extensive University library, well-equipped studios, laboratories, and equipment for interior design, clothing construction and textile analysis. The department has two student chapters of professional organizations, the ASID and AATCC.

Graduate Study

The department offers advanced work leading to a Master of Science degree. Programs of study are individually planned for the students and are aimed at developing skills and concepts which will promote professional and personal advancement.

The Department of Clothing, Textiles and Interior Design participates in the graduate program for the Ph.D. in home economics.

Courses in Clothing and Textiles

Undergraduate Credit

610 131. Clothing and Society. (3) I, II, alt. S. Cultural, social, psychological, and economic aspects of clothing needs and practices of individuals and groups. Two hours lec. and one hour discussion. Pr.: Open only to freshmen and sophomores. 610-131-0-1303

610 150. 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. 610-220-1-1303

610 220. Fundamentals of Costume Design. (3) I, II. Application of function, form, and color to costume design. Pr.: Art 100. 610-220-1-1303

610 230. Fashion Marketing. (3) I, II. Overview of the fashion profession: career opportunities and influences on the marketing of fashion goods. 610-230-0-1303

610 260. Textiles. (3) I, II, alt. S. Fundamentals of textiles as related to the problems of the consumer. Two hours rec. and two hours lab. a week. Pr.: Sophomore standing. 610-260-1-1303

610 300. Advanced Clothing Construction. (3) I, 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.: C&T 150 and C&T 260 or concurrently. 610-300-1-1303

610 315. Costume Illustration. (3) II. The changing fashion figure and fashion renderings; fundamental fashion layout. Pr.: Art 225, C&T 220, or consent of instructor. 610-315-1-1303

610 360. Textile Testing. (3) Alt. I, II. Basic principles and methods used in analyzing end-use performance of textiles. One hour lecture and four hours lab per week. Pr.: C&T 260. Not open to seniors in 611 option. 610-360-1-1303

610 395. Visual Merchandising. (3) I, II. Basic principles and techniques of merchandising display; experience through cooperation with retail stores. Pr.: Art 100. 610-395-1-1303

610 400. Tailoring. (3) I, II, alt. S. Beginning tailoring techniques applied in the construction of a coat or suit based on a commercial pattern. Pr.: C&T 300. Six hours lab. a week. 610-400-1-1303

610 440. Socio-Psychological Aspects of Clothing. (3) I, II. An interdisciplinary approach to the concepts and theories applied to the study of clothing and its expression and use in relation to self, society and culture. Pr.: Soc. 211 and Psych. 110. Not open to freshmen, sophomores or students who have taken C&T 131. 610-440-0-1303

610 450. Fashion Marketing Field Experience. (5) I. Observation and supervised experience in merchandising procedures in a retail establishment. Pr.: C&T 230 and B.A. 260. Junior or senior in 610 option, 2.2 cum. GPA, and 2.5 GPA in professional courses. 610-450-2-1303

Undergraduate And Graduate Credit In Minor Field

610 500. Intermediate Costume Design. (3) I. Design by illustration, with emphasis on functional and original design solutions; and on fashion sources. Pr.: C&T 315 and Art 220. 610-500-1-1303

Undergraduate And Graduate Credit

610 610. Theory of Pattern Design. (3) I, II, S. Introduction to basic principles and techniques used in the development, alteration, and styling of patterns through the use of pattern drafting and flat pattern design. Pr.: C&T 150. 610-610-1-1303

610 636. Fashion Merchandising. (4) II. The processes involved in managing fashion departments. Pr.: C&T 230, and junior or senior standing. 610-636-0-1303

610 645. Textile and Apparel Industry. (3) I. The textile industry from fiber production to the ultimate consumer. Pr.: Econ. 110; C&T 260. 610-645-0-1303

610 650. Textile Fibers. (3) I, alt. S. Indepth study of fibers. Two hours rec. and three hours lab per week. Pr.: C&T 260 and Chem. 191 or 351. 610-650-0-1303.

610 670. Textiles for Merchandising. (3) I, II. Application of principles of textiles to end-uses; characteristics of fibers used in household textiles, apparel, and accessories; emphasis on serviceability and comparison shopping. Pr.: C&T 260, Chem. 191, and junior or senior in 610 or 613 option. 610-670-0-1303

610 710. Advanced Tailoring. (3) II, alt. S. Construction of a garment, using different fabrics and utilizing custom tailoring techniques. Pr.: C&T 400 and 610 or 720. 610-710-1-1303

610 715. Advanced Flat Pattern Design. (3) I. Application of flat pattern design with emphasis on the development of patterns for original designs. Pr.: C&T 610. 610-715-1-1303

610 720. Designing by Draping. (3) II, alt. S. Social significance of fashion; application of design principles in dress. Designs draped in muslin and then completed in suitable fabrics. Six hours lab. a week. Pr.: Six hours clothing construction, C&T 610 recommended. Fashion Design majors must take concurrently with Advanced Costume Design. 610-720-1-1303

610 725. Pattern Drafting Techniques. (3) II. Study of advanced pattern drafting techniques with emphasis on the bodice and pants for different figure types. Pr.: C&T 610. 610-725-1-1303

610 730. History of Costume: Western Dress to 1815. (3) I, II, alt. S. Interrelationships of costume and social, cultural, political, economic environments from antiquity to 1815; evolution of garments. Pr.: Hist. 501. 610-730-0-1303

610 731. History of Costume: Western Dress from 1815 to Present. (3) II, alt. S. Interrelationships of costume and social, cultural, political, economic environments from 1815 to present with emphasis on fashion cycles, development of ready-to-wear and haute couture designing. Pr.: C&T 730. 610-731-0-1303

610 735. Fashion Promotion. (3) II, alt. years. Promotion of fashion merchandise including advertising, fashion show production, special events, selling techniques, and other promotional activities in industry and retailing. Pr.: C&T 230 and B.A. 420. 610-735-0-1303

610 740. Advanced Costume Design. (3) Alt. years. Design orientation for market size range. Pr.: C&T 500. 610-740-1-1303

610 750. Experimental Textiles. (Var.) Offered on sufficient demand. Individual investigation into textile research. Pr.: C&T 650. 610-750-1-1303

610 756. Physical Analysis of Textiles. (3) I. Theory and application of serviceability, wear, abrasion, shrinkage, porosity and other physical components to fabric testing. One hour rec. and six hours lab. a week. Pr.: C&T 650. 610-756-1-1303

610 760. Clothing and Textiles Seminar. (Var.) II, alt. S. 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. 610-760-0-1303

610 765. Chemical and Optical Analysis of Textiles. (3) II. Application of organic chemistry and optical analysis to fibers, dyes, and finishes. One hour rec. and six hours lab. Pr.: C&T 650 or 670, Chem. 191 or 351. 610-765-1-1303

610 760. Problems in Clothing and Textiles. (Var.) I, II, S. Work is offered in garment designing, textiles, history of costume, clothing economics. Pr.: Senior or graduate standing; consent of instructor. 610-780-3-1303

610 765. Problems in Costume Design. (Var.) I, II, S. Problems planned with the student to meet particular needs. Pr.: C&T 500 or consent of instructor. 610-785-3-1303

Graduate Credit

610 631. Experimental Clothing Construction. (2-3) I, alt. S. Recent developments in clothing construction, utilizing experimental projects and innovative methods. Six hours lab. a week. Pr.: Six hours of clothing and textiles. 610-831-1-1303

610 635. Fashion Industries in the Economy. (3) I, alt. S. Issues in the production and distribution in textiles, clothing, and home furnishings. Pr.: Econ. 110; six hours in C&T. 610-835-0-1303

610 645. Clothing and Human Behavior. (3) II in alt. years. Influences of the psychological, cultural, and social aspects of clothing upon human behavior. Pr.: Anthro. 200 and C&T 131 or C&T 440. 610-845-0-1303

610 651. Textile and Clothing Literature. (2) I, alt. S. Review of current literature with implications for future research. Pr.: Eight hours of clothing and textiles and eight hours of physical science. 610-851-3-1303

610 660. Contemporary Topics in Clothing and Textiles. (2-3) I, alt. 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. 610-860-0-1303

610 870. Case Studies in Fashion Marketing. (3) On sufficient demand. Independent and creative solutions to typical problems in the fashion industry by means of case study method. Pr.: B.A. 541, C&T 645 or consent of instructor. 610-870-0-1303

610 896. 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. 610-898-4-1303

610 899. Research in Clothing and Textiles. (Var.) I, II, S. Research in clothing or textiles which may form the basis for the master's thesis. Pr.: Consent of instructor. 610-899-4-1303

610 999. Research in Clothing, Textiles, and Interior Design. (Var.) I, II, S. Pr.: Consent of major professor. 610-999-4-1303

Courses in Interior Design

Undergraduate Credit

611 101. Design for Contemporary Living. (3) I, II. Development of critical awareness of the application of principles of design in contemporary living. 611-101-0-1399

611 240. 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. 611-240-1-1399

611 320. 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 concurrent enrollment, Hist. 101. 611-320-0-1399

611 340. Interior Design Studio II. (3) I, II. Design process related to color, space planning, materials, and furnishings within living environments. Basic design skills. Six hours studio a week. Pr.: Art 190, 200, Pre-Des. Prof. 211, and I. Des. 240. 611-340-1-1399

611 360. 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. 611-360-0-1399

611 435. 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 esthetic, functional, and behavioral interior planning; relationship among the systems, properties, methods, techniques and materials in interior design. Pr.: I. Des. 340 or concurrent enrollment. 611-435-0-1399

611 440. 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.: I. Des. 340. 611-440-1-1399

611 460. Interior Design Practices and Procedures. (3) I, II. Professional ethics and business practices; sources, materials, and construction methods used in home furnishings and residential interiors. Pr.: I. Des. 340 or concurrent enrollment. 611-460-0-1399

Undergraduate And Graduate Credit In Minor Field

611 540. Interior Design Studio IV. (3) I. Analysis, organization and development of multi-functional interior spaces within living environments. Establishment of design priorities evolving from data gathering and problem solving techniques. Six hours studio a week. Pr.: I. Des. 440; I. Des. 650 or concurrent enrollment. 611-540-1-1399

Undergraduate And Graduate Credit

611 600. 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. 611-600-2-1399

611 640. 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.: I. Des. 440. 611-640-1-1399

611 650. Contemporary Home. (3) I. Living environments explored in three-dimensional studies. Two hours lec.; two hours lab. Pr.: I. Des. 340. 611-650-0-1399

611 740. 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 and C.&T. 260. 611-740-0-1399

611 751. Designing for Exceptional Needs. (3) II. Problems encountered in designing for children, handicapped, aged, and the confined. Pr.: I. Des. 440. 611-751-0-1399

611 760. Historic Preservation and Restoration of Interiors. (3) I. Principles, guidelines, and qualities of preservation and restoration of interiors. Research and application. Pr.: I. Des. 320 and 360; or C&T. 730 and 731; or Pre-Des. Prof. 250 and 251. 611-760-0-1399

611 780. Interior Design Seminar. (2-3) I, II, alt. S. Analysis of current developments in the field. May be taken more than one semester with a maximum of six credit hours. Pr.: Eight hours of credit basic to field and consent of instructor. 611-780-0-1399

611 762. Problems in Interior Design. (Var.) I, II, S. Problems planned with the student to meet particular needs. Pr.: consent of instructor. 611-782-3-1399

Graduate Credit

611 820. Readings in Interior Design. (2) I, II, S. Directed study in current problems of interior design. Pr.: I. Des. 440 or consent of instructor. 611-820-3-1399

611 899. Research in Interior Design. (Var.) I, II. Research which may form the basis for the master's thesis. Pr.: Graduate standing. 611-899-4-1399

Option in Fashion Marketing

Department of Clothing, Textiles, and Interior Design

Concentration in fashion marketing prepares students for careers in apparel production management; retail management, including buying; sales promotion at industry and retail levels; and with fashion publications, trade associations, and consultant services. A highlight of the senior year is the fashion marketing field experience, in which students work for 5-6 weeks in a department or specialty store under supervision of the retailer and the university. See page 275 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Hist.	241 501	Heritage of Western World	4
Math.	245 100	College Algebra	3
Chem.	221 110	General Chemistry	5
Chem.	221 190	Elem. Organic Chemistry	3
Chem.	221 191	Elem. Organic Chem. Lab.	2
		Communications Elective	3

Professional and Supporting Courses

Art	209 100	Oesign I	2
C.S.	286 200	Fund. of Comp. Prog.	2
C.S.	286 202	PL/1 Lang. Lab	1
Bus. Ad.	305 260	Fund. of Accounting	3
Bus. Ad.	305 420	Management Concepts	3
Bus. Ad.	305 440	Marketing	3
Bus. Ad.	305 540	Consumer Behavior	3
C.&T.	610 131	Clothing and Society	3
		OR	
C.&T.	610 440	Socio-Psychological Aspects of Clothing	3
C.&T.	610 150	Principles of Clothing Construction	3
C.&T.	611 240	Interior Oesign Studio I Oesign	3
		OR	
C.&T.	610 220	Fundamentals of Costume Oesign	3
C.&T.	610 230	Fashion Marketing	3
C.&T.	610 260	Textiles	3
C.&T.	610 395	Visual Merchandising	3
		OR	
C.&T.	610 735	Fashion Promotion	3
C.&T.	610 636	Fashion Merchandising	4
C.&T.	610 450	Fashion Marketing Field Experience	5
		OR	
Bus. Ad.	305 531	Personnel and Wage Administration	3
		ANO	
Bus. Ad.	305	Business Elective	3
C.&T.	610 730	History of Costume	3

Six hours to be selected from:

C.&T.	610 360	Textile Testing	3
C.&T.	610 645	Textile and Apparel Industry	3
C.&T.	610 670	Textiles for Merchandising	3

Unrestricted Electives 15-18

Option In Textile Science

Department of Clothing, Textiles, and Interior Design

The textile science option is designed specifically for students interested in one of the many textile areas such as quality control, fiber and fabric development, and textile testing. The option also is designed for students interested in pursuing graduate degrees for teaching, research and extension service.

Concentration is focused on courses which will prepare the student for rewarding careers in the textile industry. Positions are available in areas of quality control, textile technology, technical services, promotion and sales, research and product development. See page 275 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Professional and Supporting Courses

Art	209 100	Oesign I	2
Chemistry	221 210	Chemistry I	4
Chemistry	221 230	Chemistry II	4
Chemistry	221 350	Gen. Org. Chemistry	3
Chemistry	221 351	Gen. Org. Chem. Lab.	2
		OR	
Chemistry	221 190	Elem. Organic Chem.	3
Chemistry	221 191	Elem. Organic Chem. Lab.	2
		OR	
Chemistry	221 531	Organic Chem. I	3
Chemistry	221 532	Organic Chem. I Lab.	2
Chemistry	221 271	Chemical Analysis	4
		OR	
Biochemistry	211 521	Gen. Biochemistry	3
		OR	
Chem.	221 540	Research Techniques	3
Mathematics	245 100	College Algebra	3
Physics	265 115	Oes. Physics	4
Statistics	285 320	Elements of Statistics	3
C.S.	286 200	Fund. Computer Prog.	2
C.S.	286 202	PL/1 Lang. Lab.	1
C.&T.	610 131	Clothing and Society	3
		OR	
C.&T.	610 440	Socio-Psych. Aspects of Clothing	3
C.&T.	610 150	Prin. Clothing Construction	3
C.&T.	610 260	Textiles	3
C.&T.	610 645	Textile and Apparel Ind.	3
C.&T.	610 650	Textile Fibers	3
C.&T.	610 756	Phys. Analysis of Textiles	3
I.Oes.	611 240	Interior Oesign Studio I	3
F. Ec.	630 420	Housing	3
		OR	
F. Ec.	630 605	Consumer and the Mkt.	3

Unrestricted Electives 20-22

Option In Fashion Design

Department of Clothing, Textiles, and Interior Design

The fashion design option initiates students in the basic skills and knowledge required in careers in custom designing, fashion design at industry level, fashion illustration and pattern drafting. Students take courses in the areas of clothing construction and design, art, pattern development, textiles, and costume history. An extensive historic textile and costume collection is available for study. See page 275 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Chem.	221 110	General Chemistry	5
Chem.	221 190	Elem. Organic Chemistry	3
		OR	
Phys.	265 101	Man's Physical World I	3
Phys.	265 103	Man's Phys. World I Lab.	1
Phys.	265 102	Man's Physical World II	3
Phys.	265 104	Man's Phys. World II Lab	1
Hist.	241 501	Heritage Western World	4
Soc.	277 211	Intro. Sociology	3
		Biological Science	3
		Modern Language Sequence	6-8

Professional and Supporting Courses

Art	209 100	Design I	2
Art	209 190	Drawing I	2
Art	209 195	Survey of Art Hist. I	3
Art	209 196	Survey of Art Hist. II	3
Art	209 210	Drawing II	2
Art	209 220	Water Color I	2
Art	209 225	Fig. Drawing I	2
C.&T.	610 131	Clothing and Society	3
		OR	
C.&T.	610 440	Socio-Psych. Aspects of Clothing	3
C.&T.	610 150	Prin. Clothing Construction	3
C.&T.	610 220	Fund. Costume Design	3
C.&T.	610 260	Textiles	3
C.&T.	610 300	Adv. Clothing Construction	3
C.&T.	610 315	Costume Illustration	2
C.&T.	610 400	Tailoring	3
C.&T.	610 500	Inter. Costume Design	3
C.&T.	610 610	Theory of Pattern Design	3
C.&T.	610 720	Design by Draping	3
C.&T.	610 730	History of Costume	3
C.&T.	610 740	Advanced Costume Design	3
I. Des.	611 740	History of Fabric Design	3

Unrestricted Electives 14-17

Option In Interior Design

Department of Clothing, Textiles, and Interior Design

The course of study prepares students for professional practice as interior designers. Opportunities for graduates exist in residential interior design, design consulting, specialized merchandising, extension, and research.

Students participate in a series of studio exercises and lecture courses. Practical insights into the profession are gained through an interior design field experience. See page 275 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Art	209 195	Survey Art Hist. I	3
Art	209 196	Survey Art Hist. II	3
Hist.	241 101	Western Civ.: Rise of Europe	3

Professional and Supporting Courses

Pre-Des. Prof.	104 210	Design Graphics I	3
Pre-Des. Prof.	104 211	Design Graphics II	3
Arch.	105 301	Appreciation of Arch.	3
Art	209 100	Design I	2
Art	209 190	Drawing I	2
Art	209 200	Design II	2
Art	209 230	Sculpture I	2
		OR	
Art	209 265	Ceramics I	2
		OR	
Art	209 260	Design in the Crafts	2
		OR	
Art	209 270	Metalsmithing and Jewelry	2
		OR	
Art	209 275	Weaving I	2
C.&T.	610 260	Textiles	3
I. Des.	611 240	Interior Design Studio I	3
I. Des.	611 320	History of Interior Design I	3
I. Des.	611 340	Interior Design Studio II	3
I. Des.	611 360	History of Interior Design II	3
I. Des.	611 435	Interior Design Systems	3
I. Des.	611 440	Interior Design Studio III	3
I. Des.	611 460	Interior Design Practices and Procedures	3
I. Des.	611 540	Interior Design Studio IV	3
I. Des.	611 640	Interior Design Studio V	3
I. Des.	611 650	Contemporary Home	3

Two courses to be selected from the following five:

Bus. Ad.	305 202	Small Business Operations	3
Bus. Ad.	305 260	Fund. Accounting	3
Bus. Ad.	305 292	Business Law I	3
Bus. Ad.	305 440	Marketing	3
Bus. Ad.	305 543	Sales Communication	3

Professional Electives

Eight to ten hours to be selected from:

Pre-Des. Prof.	104 280	Landscape Ecol.	2
L. Arch.	110 250	Gen. Landscape Design	3
Art	209 220	Watercolor I	2
Art	209 290	Lettering	2
I. Des.	611 600	Interior Design Field Exp	4
I. Des.	611 740	Historic Fabric Design	3
I. Des.	611 751	Designing for Exceptional Needs	3
I. Des.	611 760	Historic Preservation	3
I. Des.	611 780	Interior Design Seminar	2
F. Ec.	630 420	Housing	3
F. Ec.	630 620	Social Effects of the Housing Environment	3
F. Ec.	630 650	Consumer Product Safety	3

Unrestricted Electives 9-13

DIETETICS, RESTAURANT AND INSTITUTIONAL MANAGEMENT

Marian Spears, Head of Department*

Professor Spears;* Associate Professor Riggs and Vaden;* Assistant Professors Canter and Roach;* Instructors Gilroy, Ingalsbe, Morrison, and Owens. Emeritus: Professors Shugart* and West;* Associate Professor Ziegler.*

The programs in the Department of Dietetics, Restaurant and Institutional Management are designed to prepare students for professional careers as dietitians or foodservice managers in health care facilities, community projects, colleges and universities, schools, commercial and industrial operations. Instruction is offered in three distinct programs each of which leads to a B.S. in home economics: 1) coordinated undergraduate program in dietetics, 2) traditional dietetics, 3) college and school foodservice. The Department of Dietetics, Restaurant and Institutional Management administers the curriculum in restaurant management which leads to the degree B.S. in restaurant management.

Coordinated Undergraduate Program in Dietetics. Upon completion of the basic requirements, students may at the beginning of the junior year enter the coordinated undergraduate program in dietetics, which integrates classroom with clinical experiences, culminating in a B.S. in home economics and eligibility for active membership in The American Dietetic Association (ADA) and for registration as a dietitian (R.D.) upon passing a national qualifying examination. Junior and senior students obtain coordinated management experience in the residence halls and K-State Union foodservices on campus. In addition, senior students in the program acquire clinical experience for one semester in the Wichita KSU Dietetic Center. Because of its professional connotation, the following criteria have been established for admission and continuation in the program:

1. Transfer students must satisfy KSU admission requirements.
2. G.P.A. of 2.2 on a 4.0 scale for the first two years.
3. Provide health report and personal references with application which must be filed at the end of the sophomore year.
4. Approval of the dietetics executive committee.
5. G.P.A. of 2.5 in professional courses at the end of the junior year for continuation in the program.

Traditional Dietetics. Completion of this program, after the basic requirements, results in a B.S. in home economics and associate membership in ADA. Active membership may be obtained by one of three methods, each individually approved by ADA: 1) internship, 2) traineeship, or 3) three years of experience in dietetics. Active membership qualifies for ADA registration.

College and School Foodservice. Although this program is not specifically designed to lead toward ADA membership, individual student programs can be arranged to accomplish this end.

Graduate Study

Graduate study toward the M.S. in institutional management degree is offered after the completion of a four-year curriculum substantially equivalent to that required of undergraduate students majoring in dietetics, restaurant or institutional management at this university. Holders of a M.S. degree may be eligible for ADA membership following a one-year assistantship or six months of approved experience. The Department of Dietetics, Restaurant and Institutional Management participates in the graduate program for the Ph.D. in home economics.

Courses in Dietetics, Restaurant and Institutional Management

Undergraduate Credit

660 400. School Lunch Management I. (2) S. Basic principles of nutrition, menu planning and quantity food production as related to school foodservices. 660-400-0-1307

660 410. School Lunch Management II. (2) S. Problems of the school foodservice manager, including employee training and scheduling, supervision, and financial control. Pr.: DRIM. 400. 660-410-0-1037

660 430. 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. 660-430-0-1307

660 440. Fundamentals of Quantity Food Production. (4) 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. Two hours rec. and six hours lab. Pr.: F&N 300. 660-440-1-1307

660 445. School Foodservice Management. (2-3) II, S. Managerial functions in the school foodservice system. Pr.: DRIM. 440 or equiv. 660-445-0-1307

660 450. Field Experience in Dietetics and Institutional Management. (1-5) I, II, S. Supervised professional experience in dietetics and institutional foodservice. May be taken more than once. 660-450-2-1307

660 460. Instructional Competencies for Dietetic Practice. (3) I, II. Professional dietetics practice applied to group and individual work with clients and personnel. Includes training, development of instructional materials, consultation, interviewing skills. Pr.: DRIM. 440. 660-460-0-1307

660 470. Seminar in Restaurant Management. (1-3) I, II. Current developments and trends in restaurant management. Pr.: 660 440. 660-470-0-1307

660 472. Restaurant Merchandising. (3) II. Product, competition, and market analyses; development of restaurant theme; merchandising plans; internal and external sales promotion for foodservices. Pr.: 305 440 (or concurrent enrollment) and 660 440. 660-472-0-1307

660 475. Field Experience in Restaurant Management. (1-3) I, II, S. Supervised experience in a commercial foodservice. Pr.: 660 440. 660-475-2-1307

Undergraduate And Graduate Credit

660 635. Foodservice Equipment and Layout. (2) I, II. Factors affecting the selection and arrangement of equipment in foodservice systems. Field trip required. Pr.: DRIM. 440. 660-635-0-1307

660 640. Organization and Management of Foodservices. (2 or 3) II, S. Principles of management as applied to foodservices; study of foodservice policies, budgets, supervision and personnel. Three hours rec. a week. Field trip required. Pr.: DRIM. 650 or consent of instructor. 660-640-0-1307

660 650. Foodservice Systems. (6) I, II. Institutional foodservice as a system; menu planning, forecasting; procurement, production and service; employee training; supervisory experience in campus and community foodservices. Field trip required. Two credits rec., four credits practicum. Pr.: DRIM. 440 and consent of instructor. 660-650-2-1307

660 660. Management in Dietetics. (9) I, II. Functions of management in foodservice; financial control policy making, interdepartmental relationships, foodservice planning; independent study and management experience in campus and other foodservices. Three credits rec., six credits lab. Pr.: DRIM. 650 and consent of instructor. 660-660-2-1307

660 665. Computer-assisted Foodservice Management. (1-2) I, II. Application of computer assistance in the foodservice system utilizing a dietetic educational model. Pr.: DRIM. 650. 660-665-0-1307

660 670. Seminar in Dietetics. (1-2) I, II. Investigation of trends and current research in dietetics. Pr.: DRIM. 650 and consent of instructor. May be taken more than once. 660-670-0-1307

660 710. Readings in Institutional Management. (1-3) I, II, S. Directed study of current literature in institutional management and related areas. 660-710-3-1307

660 755. Foodservice in Community Institutions. (Var.) I, S. Management of the foodservice in small hospitals, nursing homes, and schools. Pr.: DRIM. 440 or consent of instructor. 660-755-0-1307

660 760. Problems in Institutional Management. (Var.) I, II, S. Individual investigation of problems in institutional management. Conferences and reports at appointed hours. Pr. or conc.: DRIM. 640, consent of instructor. 660-780-3-1307

660 785. 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.: DRIM. 640. 660-785-2-1307

Graduate Credit

660 805. Food Production Management. (3) II. Production planning and controls in foodservice systems. Decision optimization and application of computer-assisted management and systems analysis in foodservice organizations. Pr.: DRIM. 650 or consent of instructor. 660-805-1-1307

660 810. Institutional Management Research Techniques. (3) I. Survey and application of research methodology in institutional management. Pr.: DRIM. 440. 660-810-0-1307

660 880. Resource Procurement and Foodservice System Planning. (3) II. Principles and methods of planning, selection, and purchasing resources for the foodservice system. Consideration of automation and convenience food systems. Pr.: DRIM. 650 and 635 or consent of instructor. 660-880-0-1307

660 885. Seminar in Institutional Management. (Var.) I, S. Developments in research related to foodservice management. May be taken more than one semester with consent of student's advisory committee. Pr.: DRIM. 640 and consent of department head. 660-885-0-1307

660 890. Foodservice Administration. (2 or 3) II, S. Advanced study of management as applied to foodservice systems; organizational structure, financial and personnel policies, responsibilities and problems of management. Pr.: DRIM. 640. 660-890-0-1307

660 899. Research in Institutional Management. (Var.) I, II, S. Pr.: Consent of instructor. 660-899-4-1307

660 999. Research in Institutional Management. (Var.) I, II, S. Pr.: Consent of major professor. 660-999-4-1307

Option In Dietetics And Institutional Management

Department of Dietetics, Restaurant and Institutional Management

Opportunities exist for dietitians or foodservice managers in health care facilities, colleges and universities, schools and other types of foodservice. Three separate programs are available in this option. The coordinated undergraduate program in dietetics which combines classroom and clinical experience leads to a B.S. degree and active membership in the American Dietetic Association (ADA). The program in traditional dietetics leads to a B.S. degree and active membership in ADA upon completion of an approved internship or traineeship. The college and school foodservice program culminates in a B.S. degree and individual student programs can be arranged to satisfy ADA requirements. See page 279 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Soc.	277 211	Intro. to Sociology	3
		Humanities Electives	3

Supporting Courses*

Biology	215 19B	Prin. Biology	4
Inf. Ois.	720 650	Fundamentals of Veterinary Public Health	3
		OR	
Biology	215 220	Bacteriology and Man	3
		OR	
Biology	215 555	Microbiology	4
Biol.	215 240	Human Body	6
Chem.	221 110	Gen. Chemistry	5
Biochem.	211 120	Intro. Organic & Biochem.	5
		OR	
Chem.	221 190	Elem. Organic Chem.	3
		AND	
Chem.	221 191	Elem. Organic Chem. Lab.	2
		AND	
Biochem.	211 201	Elem. Biochem.	3

* Two units of high school algebra required OR 245 010, Intermediate Algebra, must be taken.

CHOOSE ONE OF THE PROFESSIONAL PROGRAMS I, II, III

Program I — Coordinated Undergraduate Program in Dietetics.

Selected admission. (See below.)

Bus. Ad.	305 531	Personnel and Wage Admin.	3
F.&N.	640 601	Food Science	4
F.&N.	640 602	Principles of Nutrition	3
F.&N.	640 710	Nutr. Life Cycle	3
ORIM	660 430	Intro. Prof. Diet. Prac.	1
ORIM	660 440	Fund. Quant. Fd. Prod.	4
DRIM	660 460	Instr. Comp. Diet. Pract.	3
DRIM	660 635	Foodserv. Equip. & Layout	2
DRIM	660 650	Foodservice Systems	6
DRIM	660 660	Mgmt. in Dietetics	9
DRIM	660 665	Comp.-Asst. Foodserv. Mgmt.	1
DRIM	660 670	Seminar in Dietetics	1-2

Clinical Experience in Wichita

F.&N.	640 613	Applied Normal Nutr.	3
F.&N.	640 614	Nutr. in Medical Science	6
F.&N.	640 615	Nutritional Care of Patients	6
ORIM	660 670	Seminar in Dietetics	1-2

Program II — Traditional Dietetics

ASI	005 671	Meat Sel. Utiliz.	3
Bus. Ad.	305 531	Personnel and Wage Admin.	3
F.&N.	640 601	Food Science	3
F.&N.	640 602	Principles of Nutrition	3
F.&N.	640 710	Nutr. Life Cycle	3
F.&N.	640 712	Diet Therapy	3
DRIM.	660 430	Intro. Prof. Diet. Prac.	1
DRIM.	660 440	Fund. Quant. Fd. Prod.	4
DRIM.	660 460	Instr. Comp. Diet. Pract.	3
DRIM	660 635	Foodservice Equip. & Layout	2
DRIM	660 640	Org. & Mgmt. of Foodservice	3
DRIM	660 650	Foodservice Systems	6
DRIM	660 665	Comp. &Asst. Foodservice Mgt.	1
F.&N.	640	Foods & Nutr. elective above 600 level	3

Program III—College and School Foodservice

ASI	005 671	Meat Sel. Utiliz.	3
Bus. Ad.	305 260	Fund. of Accounting	3
Bus. Ad	305 370	Managerial Cost Controls	3
Bus. Ad	305 531	Personnel and Wage Admin.	3
F.&N.	640 601	Food Science	4
F.&N	640 602	Principles of Nutrition	3
DRIM	660 440	Fund. Quant. Fd. Prod.	4
ORIM	660 460	Instr. Comp. Diet. Pract.	3
DRIM	660 635	Foodserv. Equip. & Layout	2
ORIM	660 640	Org. & Mgmt. of Food-services	3
ORIM	660 650	Foodservice Systems	6
DRIM	660 665	Comp.-Asst. Foodserv Mgmt.	1
		Additional Business courses	6

Criteria for Admission to and Continuation in Coordinated Program:

1. Transfer students must satisfy KSU admission requirements
2. G.P.A. of 2.2 on a 4.0 scale for the first two years.
3. Provide health report and personal references with application which must be filed at the end of the sophomore year.
4. Approval of the dietetics executive committee.
5. G.P.A. of 2.5 in professional courses at the end of the junior year for continuation in the program.

Unrestricted Electives **6-25**

Curriculum In Restaurant Management

B.S. In Restaurant Management

Qualified men and women fill administrative positions in commercial and industrial foodservices, such as restaurants, hotels, coffee shops, cafeterias, and tea rooms. Summer experience under approved conditions is advised throughout the time students are enrolled in this curriculum.

Liberal-General Education Courses, 49-50 Hours

Communications 8

English	229 100	English Composition I	3
English	229 120	English Composition II	3
Speech	281 105	Oral Communication I	2

Humanities Electives ..... Minimum 3
Social Science 12

Economics	225 110	Economics I	3
Economics	225 120	Economics II	3
Psychology	273 110	General Psychology	3
Sociology	277 211	Intro. to Sociology	3

Physical Science				19
Chemistry	221	110	General Chemistry	5
Biochemistry	211	120	Intro. Org. & Biochem.	5
			OR	
Chemistry	221	190	Elem. Org. Chemistry	3
			AND	
Chemistry	221	191	Elem. Org. Chem. Lab.	2
Math	245	100	College Algebra	3
Statistics	285	350	Bus. Econ. Stat. I	3
Compt. Sci.	2B6	200	Fund. of Compt. Prog.	2
			AND	
Compt. Sci.			Compt. Sci. Lang. Lab.	1
Biological Science				7-B
Biology	215	198	Principles of Biology	4
Biology	215	220	Bacteriology and Man	3
			OR	
Biology	215	555	Microbiology	4
			OR	
Inf. Dis.	720	650	Fund. of Vet. Pub. Health	3

Professional and Supporting Courses, 61 Hours

ASI	005	671	Meat. Sel. and Util.	3
Bus. Ad.	305	260	Fund. of Accounting	3
Bus. Ad.	305	370	Managerial & Cost Controls	3
Bus. Ad.	305	390	Business Law I	3
Bus. Ad.	305	440	Marketing	3
Bus. Ad.	305	450	Business Finance	3
Bus. Ad.	305	531	Personnel & Wage Admin.	3
Bus. Ad.	305	630	Industrial Relations	3
CTIO.	611	101	Design for Contemp. Living	3
F.&N.	640	132	Basic Nutrition	3
			OR	
F.&N.	640	602	Prin. of Nutrition	3
F.&N.	640	300	Meal Management	3
F.&N.	640	601	Food Science	4
DRIM.	660	440	Fund. Quant. Fd. Prod.	4
DRIM.	660	470	Sem. in Rest. Mgmt.	2
DRIM.	660	472	Restaurant Merch.	3
ORIM.	660	475	Field Exp. in Rest. Mgmt.	3
ORIM.	660	635	Foodserv. Equip. and Layout	2
DRIM.	660	640	Org. and Mgmt. of Foodserv.	3
DRIM.	660	650	Foodservice Systems	6
ORIM	660	7B0	Prob. in Diet., Rest., & I.M.	1

Unrestricted Electives, 13-14 Hours

Other

Concepts in Phys. Ed.	1
Total for Graduation	125

FAMILY AND CHILD DEVELOPMENT

Elnora Huyck, Head of Department*

Professors Bollman,* Huyck,* Kennedy,* and Stith;* Associate Professors Bergen,* Davis,* Jurich,* Krantz, and Poresky;* Assistant Professors Bagarozzi,* Imig, Russell,* Scheidt,* Wanska, and Woods; Instructors Hathaway, Hoover, McNeil, Polson, Presnal, Purcell, and West; Emeritus Professors Kell,* McCord,* and Williams;* Assistant Professors Larson and Raffington.

Family and child development offers unique opportunities for study of children, youth, and their families, with enriching experiences in the Child Development Laboratory, the Infant and Child Care Center, and The Stone House Child Care Center, the Manhattan community, and through the Wichita semester. Courses are planned to create an awareness of the dynamics of family relationships, interaction and development through the study of individuals, couples, and other family units throughout the life cycle.

Two options are available in the department: **early childhood education** and **family life and human development.** Requirements for each are outlined on pages 285 and 286.

Out-of-Classroom Experiences: This department places great emphasis on the importance of laboratory and field experiences along with academic preparation. Laboratories are an integral part of many course offerings. The Child Development Laboratory, The Infant and Child Care Center, and The Stone House Care Center provide on-campus opportunities for students to observe, participate, and teach in child care programs. These facilities have full-day, morning and afternoon sessions and are located near Justin Hall, the main home economics building. Off-campus observation and participation with children of various ages are arranged in connection with a number of courses. A research room with one-way vision glass and an inter-communication system provide further opportunities for students to observe individuals or groups in an experimental setting.

Field experiences off campus involving direct contact with families, youth and children are available through the friendship tutoring program, the family resources center, and additional programs in Manhattan, Topeka, Kansas City, Wichita, and other Kansas communities. There are two special professional semesters which provide responsible, supervised, professional involvement for students.

Each student in the **early childhood education option** has a full semester of student teaching with pre-kindergarten aged children.

Wichita Semester: Students majoring in **family life and human development** with a concentration in the community services area have a requirement of one semester of work in Wichita. Students have found this experience to be exciting and beneficial. During this period the student is involved in various private and public agencies concerned with families, youth, and children such as: Mid-American All Indian Center, Neighborhood Youth Corps, Elks Training Center, Store Front Counseling Center, Sedgwick County Mental Health Center, Community Action Program, and the American Red Cross.

Concurrently, the student is enrolled in at least two courses, taught in Wichita by family and child development staff. During this time of professional involvement and study, students meet together for planning, direction, and evaluation. They have guidance from agency personnel and from family and child development faculty. Each participant, with assistance from family and child development staff, makes arrangements for housing during this semester.

Early Childhood Certification: Completion of the **early childhood education option** meets the academic requirements for a degree three-year Early Childhood Education Certificate as established by the State Board of Education. In addition to the option requirements, the following criteria must be met: (1) an overall grade point average of 2.2 on all work taken at Kansas State University which must be attained before enrolling in student teaching; and (2) recommendation for certification by the director of the child development laboratory and by the head of the Department of Family and Child Development to the certifying officer of Kansas State University.

There is current emphasis on special preparation for work with exceptional children. The student may

plan to add this component to the program. This is a cooperative emphasis involving the departments of Curriculum and Instruction, Health, Recreation and Physical Education, and Speech.

Dual Degree—Family and Child Development and Social Work: Students in the **family life and human development option** may choose a dual degree in **social work,** planning with an adviser in family and child development and an adviser in social work. Those electing this course of action will work closely with the family and child development advising staff to include preliminary requirements and to make proper arrangements for entry into the dual program at the junior level. Such a program will give the student an opportunity for understanding human development and the varied concerns of families along with beginning social work skills. The social work major, housed in the Department of Sociology, Anthropology, and Social Work is accredited by the Council on Social Work Education.

Dual Degree-Family and Child Development and Elementary Education: Students in the **early childhood education option** may choose a dual degree in **elementary education,** planning with an adviser in family and child development and an adviser in elementary education. This choice will require careful use of all electives and regular summer school attendance to complete the requirements in four calendar years. Students electing this choice will have two professional teaching semesters, one at the below five-year level and one at the kindergarten through third-grade level.

Graduate Study

The department offers work toward the Master of Science degree for students interested in professional opportunities such as child development programs, child guidance clinics, family life education through community agencies and public schools, college teaching, student personnel work, or research in child development, marriage, and family life. Current emphasis on day care programs and on disadvantaged families and children provides varied professional opportunities to the home economist with a graduate degree in child development and family relations.

The Department of Family and Child Development participates in the graduate program for the Ph.D. in home economics.

Courses in Family and Child Development

Undergraduate Credit

620 230. Introduction to Human Development. (3) I, II, S. A study of human development through an individual's awareness and understanding of his own physical, social and psychological growth and relationships with his family, peers, and others. One hour lec. and two hours rec. a week. 620-230-0-1305

620 235. Infancy. (3) I, II. Prenatal and infant development from conception through age two. Study of the influences on the development and growth of the infant. 620-235-0-1305

620 250. You and Your Sexuality. (3) I, II. Study of the role and meaning of human sexuality in relation to oneself as well as in inter-relationships with others. 620-250-0-1305

620 272. The Helping Relationship. (2-3) I, II, S. 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.: Psych. 110 or F.C. Dev. 230. 620-272-0-1305

620 300. Problem in Family and Child Development. (Var.) I, II, S. Independent or small group study. Pr.: Consent of instructor. 620-300-3-1305

620 310. The Preschool Child. (3) I, II, S. Principles of development and growth of children from conception to five years of age in homes and in groups. Pr.: Psych. 110 and sophomore standing. 620-310-0-1305

620 311. Preschool Child Lab. (1) I, II, S. Observation of the development and guidance of children from birth to five years of age with emphasis on observation of children in groups. Open to F.C. Dev. and Home Ed. Ed. majors only. Conc. with F.C. Dev. 310. 620-311-1-1305

620 312. Observation of the Preschool Child. (1) I, II, S. Observation and recording of behavior of children from birth to five years of age. Pr. or conc.: F.C. Dev. 310. 620-312-1-1305

620 315. Community Resources for Children. (3) I. Study of legislation, community agencies and programs pertaining to children. Field trips arranged. Pr.: F.C. Dev. 310 and Soc. 211. 620-315-0-1305

620 335. Expressive Media and Resources for Teachers of Young Children. (2-3) I, II. Skills and resources in preparing instructional materials and implementing expressive activities in the early childhood center. 620-335-0-1305

620 350. Family Relationships and Sex Roles. (3) I, II, S. Effects of family interaction upon individual development and sex roles; consideration of pre-marital, marital, and parent-child relationships. Pr.: Sophomore standing. 620-350-0-1305

620 352. Concepts of Family Health. (3) I, II. Current health issues in various developmental stages of the family. Factors conducive to maintaining health for family members from the prenatal period through old age. Pr.: Sophomore standing. 620-352-0-1305

620 370. Parenting. (3) II. Principles and philosophies relevant to the act of parenting. How to establish a nurturing relationship between parents and their children. Pr.: F.C. Dev. 230. 620-370-0-1305

620 400. Field Study in Family and Child Development. (1-8) I, II, S. Directed study of processes of human development and participation in a field setting. Pr.: Consent of department head. 620-400-2-1305

620 420. Interaction Techniques with Young Children. (3) I, II. 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. Pr.: F.C. Dev. 310 or consent of instructor. Two hours lec. and one hour lab. 620-420-0-1305

620 430. Middle Childhood. (2) I, II, alt. S. Developmental characteristics of middle childhood as a basis for guidance with emphasis on understanding of family and peer group relationships. To be taken concurrently with F.C. Dev. 431. Pr.: Psych. 110 and one of the following: F.C. Dev. 210, Educ. 215, or Psych. 280. 620-430-0-1305

620 431. Middle Childhood Lab. (1) I, II, alt. S. Observation, recording and evaluating out-of-school behavior of children 6 to 12 years of age with a focus on the helping relationship in light of developmental aspects. To be taken concurrently with F.C. Dev. 430. 620-431-1-1305

620 440. Human Development Facilitation. (2) I, II. Applied study of leadership skills in small discussion groups, with emphasis on learning and facilitating Introduction to Human Development concepts. Taken concurrently with 620 441. Prerequisites: FCD 620 230, preparatory workshop and consent of instructor. 620-430-0-1305

620 441. Human Development Facilitation Lab. (1) I, II. Recitation group leader for 620 230. Assist students in discussion and preparing group presentations; evaluate written work and course participation of students in group. Concurrent with 620 440. 620-441-1-1305

620 499. Human Service Data. (2-3) I, II, S. Preparation and interpretation of interviews, social histories, observations, surveys, and agency records. Techniques in planning, implementing, and evaluating human services. Pr.: F.C. Dev. 310 and 230. 620-499-0-1305

Undergraduate And Graduate Credit In Minor Field

620 520. The Adolescent. (2) I, II, alt. S. Focus on interpersonal processes; principles and characteristics of the helping relation in light of developmental aspects of adolescence. Take F.C. Dev. 521 concurrently. Pr.: Five hours of F.C. Dev. or five hours of a combination of Psych. and Educ. Psych. and junior standing. 620-520-0-1305

620 521. The Adolescent Lab. (1) I, II, alt. S. Observation, recording and evaluating of out-of-school behavior of adolescents with focus on developing a helping relationship with an adolescent. Take F.C. Dev. 520 concurrently. 620-521-1-1305

620 530. Advanced Study of Children. (3) I, II. History and methods of child study; analysis of developmental theory; laboratory experience for graduate students. Pr.: Psych. 420 or equiv. and F.C. Dev. 310 or Psych. 415 or consent of instructor. 620-530-0-1305

620 580. Directed Field Experience. (6-8). A block field placement in agencies outside of Manhattan. Faculty-supervised experience in direct service to clients: individuals, groups, and communities. Weekly seminar during placement emphasizes theory underlying the practice. Pr.: Soc. Work 260 and consent of instructor. 620-580-2-1305

Undergraduate And Graduate Credit

620 610. Developmental Program Planning for Young Children. (2) I, II. Principles and techniques of curriculum building to meet the needs of preschool children in the areas of social, emotional, cognitive, motor, and language development. Take F.C. Dev. 611 concurrently. Pr.: F.C. Dev. 310, F.C. Dev. major, and consent of instructor. 620-610-0-1305

620 611. Developmental Program Planning for Young Children Lab. (1) I, II. Application of principles and techniques covered in F.C. Dev. 610 in a preschool program. To be taken concurrently with F.C. Dev. 610. 620-611-1-1305

620 625. Directed Experiences in Early Childhood Education (with children 2-5). (8) I, II. Participation in a preschool program; planning, instruction, evaluation. Prearrangement and consent of instructor required. Pr.: F.C. Dev. 610 and 611. 620-625-2-1305

620 626. Child Development Center Programming. (2 or 3) I, II, alt. S. Rationale for and techniques of administering programs for preschool children, including health, education, social services, parent involvement. Pr.: Nine hours family and child development or consent of instructor. 620-626-0-1305

620 640. Characteristics and Developmental Processes of College Students. (3) I, II. Study of characteristics of college students; relate patterns of maturity to academic experiences, to formulation of life styles and to development of a sense of vocation. Pr.: F.C. Dev. 230 plus nine additional hours in F.C. Dev., Psych., Soc., or Educ. and consent of instructor. 620-640-0-1305

620 650. The Family. (2-3) I, II, S. Consideration of the family throughout the family life cycle; developmental tasks at each stage. Present-day resources available for strengthening American families. Pr.: F.C. Dev. 350 or consent of instructor. 620-650-0-1305

620 652. Black Family. (2-3) I, II. Selected topics for understanding life styles of black families. Implications for professionals working with black children and families. Pr.: Nine hours of social science and junior standing. 620-652-0-1305

620 654. Death and the Family. (2-3) I, II, S. Exploration of contemporary attitudes toward death and dying; related influences on individual development and family life. Pr.: F.C. Dev. 650 or Soc. 640. 620-654-0-1305

620 670. Parent Education. (2 or 3). I, II, alt. S. Principles in child development and family relationships applied to professional group and individual work with parents. Pr.: F.C. Dev. 210, 650, six hours psychology, or consent of instructor. 620-670-0-1305

620 700. Problems in Family and Child Development. (Var.) I, II, S. Independent study on aspects of family and child development. Students writing a master's report enroll in this course. Pr.: Consent of department head. 620-700-3-1305

620 704. Seminar in Family and Child Development. (Var.) I, II, S. Interpretation and evaluation of information on varied topics relating to family members. May be taken more than one semester with consent of department head. Pr.: F.C. Dev. 650 or consent of instructor. 620-704-0-1305

620 708. Topics in Family and Child Development. (2-3) I, II, 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. 620-708-0-1305

620 710. Child Care: Components and Issues. (2-3) Alt., II, S. Resources and facilities of quality child care; exploration of methods and philosophies of such programs; design for those working with paraprofessional child care personnel. Pr.: 15 hours of either social science and/or F.C. Dev. or combination. 620-710-0-1305

620 750. Low-Income Families. (2-3) I, II, alt. S. Factors affecting family life in disadvantaged families; life styles of sub-cultures; proposed programs; implications for persons working with low-income children and families. Pr.: F.C. Dev. 650 or consent of instructor. 620-750-0-1305

620 765. Human Sexuality. (3) II, alt. S. Focus on implications of personal and familial aspects of human sexuality throughout the life cycle. Pr.: F.C. Dev. 350 or consent of instructor. 620-765-0-1305

Graduate Credit

620 810. Child Development. (3) I, II, alt. S. Behavioral characteristics and developmental processes in childhood and adolescence. Analysis of developmental trends and issues in terms of research evidence and theoretical expectations. Pr.: Dev. 310 and three additional hours in F.C. Dev. or child psychology. 620-810-0-1305

620 815. Infant Behavior and Development. I, II, alt. 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.: F.C. Dev. 310, 810, and Biol. 198. 620-815-0-1305

620 820. Theories of Child Development. (3) I, alt. S. Theories of development relating to physical, social and psychological patterns of children's growth and interaction with the family and the community. Pr.: F.C. Dev. 530 and 810. 620-820-0-1305

620 822. Transition to Adulthood. (3) I or II, alt. years. Advanced study of theory and research of the transition period from adolescence through youth to adulthood. Pr.: F.C. Dev. 520 and 810. 620-822-0-1305

620 824. Parent-Child Interaction: Theory and Research. (2-3) I, II, S. 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.: F.C. Dev. 820. 620-824-0-1305

620 830. Advanced Program Development. (2-3) I, II, S. Analysis of the process and application of child development theory to early childhood program planning. Pr.: F.C. Dev. 820. 620-830-0-1305

620 840. Social Processes in Human Development. (3) I, alt. S. Integration of principles of social maturation and growth with physiological and self-processes of human development. Pr.: Eight hours natural science and eight hours social science or consent of instructor. 620-840-0-1305

620 842. Physiological Processes in Human Development. (3) Alt. years. Integration of principles of physiological growth with social and self-processes of human development. Pr.: Eight hours natural science and eight hours social science or consent of instructor. 620-842-0-1305

620 843. Self-Processes in Human Development. (3) II, alt. S. Integration of precepts relating to self with principles of social and physiological processes in human development. Pr.: Eight hours natural science and eight hours social science or consent of instructor. 620-843-0-1305

620 845. Adult Development and Aging. (3) I or II. Developmental aging research as related to individual, social, and family functioning throughout adulthood. Pr.: 12 hours social science. 620-845-0-1305

620 850. Family Components and Issues. (3) I, II. 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.: F.C. Dev. 650. 620-850-0-1305

620 862. Marital Interaction. (3) I, alt. S. A study of the dynamics of marital interaction with emphasis upon the interpersonal relationships and processes of adjustment. Pr.: F.C. Dev. 350, and 650, consent of instructor. 620-862-0-0135

620 870. Principles of Marriage and Family Counseling. (3) I, alt S. Examination of processes in marriage and family counseling; study of interactions within the counseling setting; and application of knowledge of the family and of marriage to the helping relationship. Pr.: Educ. 823; F.C. Dev. 840, 842, or 843 or consent of instructor. 620-870-0-1305

620 875. Delivery of Human Services. (3) I, II, alt. S. Cognitive and experiential understanding of professional responsibilities to work effectively with families in an educational outreach or consultative setting. Pr.: F.C. Dev. 272, 610, 650. 620-875-0-1305

620 879. 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.: F.C. Dev. 272 or 420 and 650. 620-879-0-1305

Practicums in Family and Child Development. (Var.) I, II, S. Supervised experience in providing help and/or instruction in the several areas of family and child development presented in terms of the special interests of the students. Consent of practicum supervisor is required for each.

620 880. Practicum in Counseling. (Same as Psych. 860 and Educ. 863.) Pr.: F.C. Dev. 810, 850, 870, 875, Educ. 823. 620-880-2-1305

620 881. Practicum in Family and Community Services. Pr.: F.C. Dev. 810, 850, 875, 879 (or concurrent). 620-881-2-1305

620 882. Practicum in Study of Student Development. Pr.: F.C. Dev. 850 or 862. 620-882-2-1305

620 883. Practicum in Early Childhood Education. Pr.: F.C. Dev. 610, 810, 850, 875 879 (or concurrent). 620-883-2-1305

620 884. Practicum in Parent Education. Pr.: F.C. Dev. 810, 850, 879 (or concurrent). 620-884-2-1305

620 890. Research Methods in Family and Child Development. (2-3) II. Study and application of family and child development methodology for research in graduate programs and professional careers. Pr.: Six hours in family and child development at 600 level or higher or consent of instructor. 620-890-0-1305

620 892. Practicum in Human Development Research. (Var.) I, II, S. Observation, modification, and reporting of behavior. Pr.: F.C. Dev. 840, 842, or 843; course in methods of research; six other graduate hours in family and child development; consent of major professor. 620-892-4-1305

620 894. Readings in Family and Child Development. (3) I, II, S. Implications of research findings in preparation for professional work in counseling, teaching, and research in family and child development. Pr.: F.C. Dev. 210 or equiv. and F.C. Dev. 650 or equiv. and six hours in social science or consent of department head. May be taken more than once. 620-894-3-1305

620 899. Research in Family and Child Development. (Var.) I, II, S. Individual research problems which may form the basis for the master's thesis. Pr.: Consent of department head. 620-899-4-1305

620 950. Family Processes. (3) Alt. years. Examination of theoretical approaches to the study of the family unit from the perspective of interpersonal relationships; participant observation of families and/or analysis of case materials. Pr.: F.C. Dev. 850. 620-950-0-1305

620 988. Conjoint and Group Techniques in Family Counseling. (3) II, S. Advanced theory in marriage and family counseling with emphasis on group techniques. Pr.: F.C. Dev. 880 and consent of instructor. 620-988-0-1305

620 999. Research in Family and Child Development. (Var.) I, II, S. Pr.: Consent of major professor. 620-999-4-1305

Option in Early Childhood Education

Department of Family and Child Development

This option is for students who wish to work in pre-kindergarten education programs in administrative or teaching positions. Such positions include work with parents and community resources as well as with young children. See page 282 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Biol.	215 198	Prin. of Biology	4
Soc.	277 211	Intro. to Sociology	3
		Literature and/or Language	6
		Music or Art Apprec. Elective	2-3
		Additional Humanities	5-6
		Math Elective*	3
		Additional Biological & Physical Science	5
		Social Science Electives at 300 level or above	6

Professional Courses

Health	261 373	First Aid	1
Sp. Path. & Aud.	283 555	Language Development	3
F. C. Dev.	620 235	Infancy	3
F. C. Dev.	620 310	The Preschool Child	3
F. C. Dev.	620 311	The Preschool Child Lab.	1
F. C. Dev.	620 335	Expressive Media	2
F. C. Dev.	620 350	Family Relationships	3
F. C. Dev.	620 420	Interactional Techniques	3
F.&N.	640 603	Maternal and Child Nutrition	3
F. C. Dev.	620 610	Devel. Prog. Pl. Young Child	2
F. C. Dev.	620 611	Devel. Prog. Pl. Young Child Lab.	1
F. C. Dev.	620 530	Advanced Study of Children	3
F. C. Dev.	620 625	Directed Experiences	8
F. C. Dev.	620 626	Child Dev't. Center Prog.	3
F. C. Dev.	620 650	The Family	3
F. C. Dev.	620 670	Parent Education	3
F. C. Dev.	620	FCD Prof. Elective	3
		Family/Community Health Elective	3

Unrestricted Electives 8-9

Option In Family Life And Human Development

Department of Family and Child Development

This option is for students interested in youth and family life programs and in the total life span approach to understanding development. See page 282 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Soc.	277 211	Intro. to Sociology	3
		Social Science Electives at 300 level or above	6
		Biological & Physical Sci.	12
		Humanities	6

Professional and Supporting Courses

F. C. Dev	620 230	Intro. to Human Development	3
F. C. Dev	620 310	Preschool Child	3
F. C. Dev	620 311	Preschool Child Lab.	1
F. C. Dev	620 350	Family Relationships	3
F. C. Dev	620 430	Middle Child	2
F. C. Dev	620 431	Middle Child Lab.	1
F. C. Dev	620 520	The Adolescent	2
F. C. Dev	620 521	The Adolescent Lab.	1
F. C. Dev	620 650	The Family	3

CHOOSE EITHER AREA A OR AREA B

Area A. Individual & Family Development

F. C. Dev	620 235	Infancy	3
F. C. Dev	620 250	You & Your Sexuality	3
F. C. Dev	620 272	Helping Relationships	3
F. C. Dev	620 352	Concepts Family Health	3
F. C. Dev	620 370	Parenting	3
		Prof. Electives*	20
		(Include Basic Nutr. if not taken in core.)	

Area B. Community Services

Soc. Wk.	279 260	Intro. Social Work	3
F. C. Dev	620 272	Helping Relationships	3
F. C. Dev	620 400	Field Study	8
F. C. Dev	620 670	Parent Education	3
F. C. Dev.	620 750	Low Income Families	3
		Prof. Electives*	15
		(Include Basic Nutr. if not taken in core.)	

Unrestricted Electives 17-18

* Selected in consultation with faculty adviser and to include at least 3 hours from the College of Home Economics (other than the FCD department.)

Dual Degree: Family And Child Development And Social Work

This 135-hour program will lead to a degree in home economics with a major in family and child development and to a degree in arts and sciences with a major in social work.

Liberal-General Education Courses (45-46 hours)

Communications (8 Hours)

Engl.	229 100	English Composition I	3
Engl.	229 120	English Composition II	3
Speech	2B1 105	Oral Communication I	2

Social Sciences (15 Hours)

Psych.	277 211	General Psychology	3
Econ.	225 110	Economics I	3
Soc.	277 211	Intro. to Sociology	3
Psych	273 520	Personality Development	3
Soc.	277 411	Social Problems	3

Biological and Physical Science (13-14 Hours)

Biol.	215 19B	Prin. of Biology	4
Biol.	215	Biology Elective	3-4
Math	245 100	College Algebra	3
Stat.	2B5 330	Stat. for Soc. Sci.	3

Humanities (9 Hours)

Phil.	259	Philosophy Elective	3
		Additional Humanities electives 500 level or above	6

Home Economics Core (10-12 Hours)

Gen. H.E.	650 120	Dim. of H.E.	1-2
I. Des.	611 101	Des. for Contemp. Living	3
F&N	640 132	Basic Nutrition	3
F. Ec.	630 400	Family Economics	3
Gen. H.E.	650 400	Home Ec. Seminar	1

NOTE: Dimensions of Home Economics may be waived for those students entering program after freshman year.

Family and Child Development (19 Hours)

F.C. Dev.	620 230	Intro. Human Dev.	3
F.C. Dev.	620 310	Preschool Child	3
F.C. Dev.	620 311	Preschool Child Lab.	1
F.C. Dev.	620 350	Family Relationships	3
F.C. Dev.	620 430	Middle Child	2
F.C. Dev.	620 431	Middle Child Lab.	1
F.C. Dev.	620 520	The Adolescent	2
F.C. Dev.	620 521	The Adolescent Lab.	1
F.C. Dev.	620 650	The Family	3

Professional Area (43 Hours)

Soc.	277 510	Soc. Welfare as Soc. Institu.	3
Soc.	277 520	Methods Soc. Research	4
Soc.	277 532	Comm. Organization	3
Soc.	277 550	Group Proc. & Soc. Beh.	3
Soc. Wk.	279 260	Intro. Soc. Work	3
Soc. Wk.	279 560	Skills & Tech. I	3
Soc. Wk.	279 561	Skills & Tech. II	3
Soc. Wk.	279 562	Field Placement	9
Soc. Wk.	279 564	Prof. Sem. in Soc. Work	3
Soc. Wk.	279 565	Prog. & Policy Form.	3
F.C. Dev.	620 272	Helping Relationships	3
F.C. Dev.	620 670	Parent Education	3

Unrestricted Electives, 14-17 Hours

Other

Concepts in Phys. Ed.	1
Total for Graduation	135

FAMILY ECONOMICS

Richard L. D. Morse, Head of Department*

Professor Morse;* Assistant Professors Annis,* Flashman, Hanna,* Lindamood, and Rasmussen. Emeritus: Associate Professor Agan.*

This department prepares students for professional work in the areas of housing, household equipment, home management, consumer education, consumer finance, financial counseling and family economics. Modern laboratory facilities and equipment are provided.

Emphasis in the department is twofold: to study the effect of social and economic forces on the family, and to study management of resources in relation to family goals. Undergraduate options are: (1) consumer affairs, and (2) housing and equipment. Also offered is the dual degree program: consumer affairs and social work.

Work leading to the Master of Science degree is offered by this department. Work leading to the doctorate is through the Ph.D. in Home Economics. Graduate students prepare for positions in consumer economics, home management, household

equipment, financial counseling, and consumer education as specialists in extension, faculty of colleges and universities, or on government and business staffs. Field study and research are conducted in community programs, consumer affairs, aging, public policy on health, housing, credit, savings, and family resource management. Research opportunities also are available in household equipment and inside environment air contaminant control. Several research and teaching assistantships are available each year.

Prerequisite to graduate work in these fields is a B.S. or B.A. degree, with a major in home economics or a related field.

Courses in Family Economics

Undergraduate Credit

630 110. Consumer Action. (2) I. Consumer rights and responsibilities emphasizing issues and problems confronting students, their families, and others as consumers. Political, social, economic, and legal implications of consumer decisions. Competencies and techniques for taking effective action. 630-110-0-1304

630 400. Family Economics. (3) I, II. Economic forces affecting families, and management by families of their economic resources. Pr.: Econ. 110 or equiv. 630-400-0-1304

630 405. Personal and Family Finance. (3) I, II. Practical aspects of money management with emphasis on consumer credit, savings, insurance, income tax, home financing and budgeting. 630-405-1-1304

630 410. Consumer Relations Practicum. (Var.) I, II, S. Supervised experiences in business-consumer relations and study of consumer issues, including consumer redress. Pr.: Consent of instructor. 630-410-2-1304

630 415. Consumer Law. (3) II. A study of law and agency regulations related to consumer protection. Pr.: F. Ec. 400, 405 or 605. 630-415-0-1304

630 420. Housing. (3) I, II. Socio-economic aspects of housing, focusing on the effects of decisions made at the family, community, and national levels on housing obtained. Topics include finance, energy, space requirements, and special groups. Two hours lec., two hours lab. a week. Pr.: Sophomore standing. 630-420-1-1304

630 440. Household Equipment. (3) I, II. Principles of operation, care and design of equipment used in the home; methods of evaluating equipment performance and demonstrating application of principles. Two hours lec. and three hours lab. a week. 630-440-1-1302

630 460. Family Resource Management Theory and Application. (2) I, II. The process of using individual and family resources for maximizing goals. Pr.: Junior standing. 630-460-0-1304

630 465. Home Management Laboratory. (2) I, II. Residence or equivalent laboratory experiences in home management including analysis and evaluation of management at different family life-cycle stages and socio-economic levels. Arrange enrollment before registration. Pr.: F. Ec. 460. 630-465-1-1304

Undergraduate And Graduate Credit

630 600. Economic Status of Women. (3) Alt. years. Discrimination, rights, and responsibilities affecting the economic roles of women. Income, wealth, gainful and nongainful employment, taxation, laws and attitudes. Pr.: Senior or graduate standing plus nine credit hours in social science. 630-600-0-1304

630 605. Consumers and the Market. (3) I, II. Problems of the consumer in the present market, market practices, aids toward intelligent buying of commodities, and the types of protection, including legislation. Pr.: Econ. 110. 630-605-0-1304

630 615. The Elderly Consumer. (3) I. An analysis of consumer problems of the elderly, emphasizing the relationship to national, state, and local public policy. Pr.: F. Ec. 400. 630-615-0-1304

630 620. Social Effects of the Housing Environment. (3) I. 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.: F. Ec. 420 or consent of instructor. 630-620-0-1304

630 630. 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 F. Ec. 440. Six hours rec. and lab. a week. Pr.: Four hours lab. science course. 630-630-1-1302

630 650. 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. 630-650-0-1304

630 660. Kitchen and Utility Areas. (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.: F.Ec. 460 or I.Des. 240 or Arch. 261. 630-660-1-1302

630 670. Field Study In Family Economics. (Var.) I, II, S. Supervised experiences with community action programs, homemakers' service, and consumer services in industry. May be taken more than one semester. Pr.: F. Ec. 400, 460, or consent of department head. 630-670-2-1304

630 680. Seminar In Family Economics. (1 to 3) I, II, S. A review of research literature; trends in the field of family economics; the contribution of the area to the family and community. Pr.: Senior or graduate standing. 630-680-0-1304

630 700. Families In the American Economy. (3) I, II. Study of the interrelation of the national economy and the family, family incomes and expenditures, cost of living estimates, measures of family welfare, public policies affecting family welfare and standards of living. Pr. or conc.: Econ. 110 or consent of instructor. 630-700-0-1304

630 705. Financial Problems of Families. (3) I. Financial problems confronting families, primarily of the middle-income classes; study of insurance, credit, savings, and estate planning as they relate to family living. Pr.: F. Ec. 405 or consent of instructor. 630-705-0-1304

630 710. Consumer Marketing Programs and Policies. (3) II. Review of consumer marketing programs and policies of education, business and government as they bear upon consumer decision-making in the market. Pr.: F. Ec. 605 or equiv. 630-710-0-1304

630 712. Family Financial Counseling. (3) II. Analyses of specific problems of financially troubled families seeking counsel from cooperating agencies. Pr.: F. Ec. 705 or conc. enrollment. 630-712-0-1304

630 713. Financial Counseling Practicum. (1-4) I, II, S. Financial counseling with a cooperating agency or business. Pr.: F. Ec. 712 or concurrent enrollment. Placement contingent on staff approval. 630-713-2-1304

630 720. Housing Requirements of Families. (1-4) II. Housing needs and requirements of families as influenced by social norms, societal values, family activities and preferences, and economic and political constraints. Field trips to gather data for course projects required. Pr.: F. Ec. 420, 620, or consent of instructor. 630-720-0-1304

630 740. 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.: F. Ec. 440, Phys. 115; senior or graduate standing. 630-740-1-1304

630 760. Management of Family Resources. (3) II. Identifying and analyzing problems of management in the home which affect the needs of individuals and create a satisfying environment for the family. Pr.: F. Ec. 460 and consent of instructor. 630-760-0-1304

630 780. Problems in Family Economics. (Var.) I, II, S. Individual investigation in standards of living and family expenditures; housing and household equipment; time and motion study; and use of family resources. Pr.: Consent of instructor. 630-780-3-1304

Graduate Credit

630 810. Resources for Consumer Education. (3) S. Survey and evaluation of the subject matter content of consumer education books, pamphlets, and audio-visuals. Pr.: C&I 450, A&O 752, or degree in social science. 630-810-0-1304

630 811. Consumer Education. (3) S. Evaluate syllabi and approaches to teaching consumer economics and consumer affairs. Pr.: C&I 450 or A&O 752 and F. Ec. 400 or consent of instructor. (See A&O 811.) 630-811-0-1304

630 815. Advances in Consumer Economics. (3) S, alt. years. Fundamental principles of consumer economics emphasizing money management, decision-making in consumer purchases, institutional factors bearing on consumer decisions. Pr.: F. Ec. 605 and 700. 630-815-0-1304

630 820. Seminar on Aging. (3) S, alt. years. Selected aspects of problems and current developments concerning the economic, housing, equipment, and managerial needs of the aging. Pr.: F. Ec. 460, 700, Econ. 110, Soc. 211, or consent of instructor. May be taken more than once with consent of department head. 630-820-0-1304

630 840. Experimental Methods in Household Equipment. (2) I, alt. years. Philosophy of household equipment evaluation and experimentation; emphasis upon instrumentation, selection of variables, and data analysis. Pr.: A course in statistics, F. Ec. 740 or consent of instructor. 630-840-1-1302

630 860. Advanced Home Management. (Var.) Alt. years. Review of current research in management, administration, decision-making, goal evaluation, and problems of families handicapped by low income, physical disability, or age. Pr.: F. Ec. 465 or consent of department head. 630-860-0-1304

630 899. Research in Family Economics. (Var.) I, II, S. Individual research problems which may form the basis for the master's thesis. Pr.: Consent of instructor. 630-899-4-1304

630 999. Research in Family Economics. (Var.) I, II, S. Pr.: Consent of major professor. 630-999-4-1304

Option In Consumer Affairs

Department of Family Economics

This option allows 30 hours of 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 in business or government. See page 286 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Econ.	225 120	Economics II	3
Math.	245 100	College Algebra	3
Pol. Sci.	269 110	Prin. Pol. Sci.	3
		OR	
Pol. Sci.	269 325	U.S. Politics	3
Soc.	277 211	Intro. to Sociology	3
Stat.	285 330	Elem. Stat. for Soc. Sci.	3
		Social Science Electives	9

Professional and Suppporting Courses

C.&T.	610 131	Clothing and Society	3
		OR	
C.&T.	610 260	Textiles	3
		OR	
C.&T.	610 440	Socio-Psych. Aspects of Clothing	3
F.C. Dev.	620 310	Preschool Child	3
		OR	
F.C. Dev.	620 650	The Family	3
F.Ec.	630 405	Personal and Family Finance	3
F.Ec.	630 415	Consumer Law	3
F.Ec.	630 420	Housing	3
F.Ec.	630 440	Household Equipment	3
		OR	
F.Ec.	630 630	Household Equip. Theory	3
F.Ec.	630 460	Family Resource Mgmt. Theory & Application	2
F.Ec.	630 465	Home Management Lab.	2
		OR	
F.Ec.	630 705	Fin. Prob. of Families	2
F.Ec.	630 605	Consumers & The Market	3
F.Ec.	630 700	Families in Amer. Econ.	3
F.&N.	640 132	Basic Nutrition	3
		Prof. Electives*	12

Unrestricted Electives 14-15

* Selected in consultation with faculty adviser.

Option In Housing And Equipment

Department of Family Economics

This option permits specialization. Professional electives allow for further choice: in equipment for those interested in design and evaluation of household equipment and education; in housing for those interested in community planning, housing counseling, research, house planning, or kitchen designing; and in home management for those interested in developing homemaker/home health aide services and home management services, and in positions as consultants in business, government, and communications. This option also provides basic training for those who wish to prepare for research. See page 286 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Biol.	215 198	Prin. of Biology	4
Math.	245 100	College Algebra	3
Stat.	285 320	Elem. of Statistics	3
		Humanities Elective	3

Students concentrating in Housing are required to take:

Pol. Sci.	269 320	State & Local Govt.	3
Soc.	277 211	Intro. to Sociology	3
Soc.	277 430	Population and Human Ecol.	3

Students concentrating in Household Equipment are required to take:

Chem.	221 110	Gen. Chemistry	5
Biochem.	211 120	Intro. Organic & Biochem.	5
Physics	265 115	Descriptive Physics	4

Professional and Supporting Courses

F. C. Dev.	620 650	The Family	3
F. Ec.	630 405	Personal and Family Finance	3
F. Ec.	630 420	Housing	3
F. Ec.	630 440	Household Equipment	3
F. Ec.	630 460	Family Resource Mgmt. Theory & Application	2
F. Ec.	630 700	Families in Amer. Econ.	3
		OR	
F. Ec.	630 605	Consumers and the Market	3
		Prof. Electives*	16-23

Students concentrating in Household Equipment are required to take:

Biology	215 220	Bact. of Man	3
		OR	
Biology	215 550	Microbiology	4
C. & T.	610 260	Textiles	3
F. Ec.	630 465	Home Management Lab.	2
F. Ec.	630 650	Product Safety	3
F. Ec.	630 740	Adv. Household Equipment	3
F. & N.	640 400	Food Preparation	3
F. & N.	640 616	Prin. of Food Demonstration	3

Students concentrating in Housing are required to take:

Arch.	109 315	Intro. to Planning	3
Soc.	277 531	Urban Sociology	3
F. Ec.	630 620	Soc. Effect of Housing Envir.	3
F. Ec.	630 720	Housing Req. of Families	3

Unrestricted Electives 14-22

* Selected in consultation with faculty adviser.

Dual Degree: Consumer Affairs And Social Work

This 135-hour program will lead to a degree in home economics with a major in consumer affairs and to a degree in arts and sciences with a major in social work.

Liberal-General Education (54-55 Hours)

Communications (8 hours)

Engl.	229 100	English Composition I	3
Engl.	229 120	English Composition II	3
Speech	281 105	Oral Communication I	2

Social Science (24 Hours)

Psych.	273 110	General Psychology	3
Econ.	225 110	Economics I	3
Econ.	225 120	Economics II	3
Soc.	277 211	Intro. to Sociology	3
Pol. Sci.	269 110	Prin. of Pol. Sci.	3
		OR	
Pol. Sci.	269 325	U.S. Politics	3

Additional 9 hours Social Science

Soc. Wk.	279 260	Intro. Social Work	3
Soc.	277 510	Soc. Welfare as Soc. Instit.	3
Soc.	277 411	Social Problems	3

Physical Science (6 Hours)

Math.	245 100	College Algebra	3
Stat.	285 330	Stat. for Soc. Sci.	3

Biological Science (8 Hours)

Biol.	215 198	Prin. of Biology	4
Biol.	215	Biology Elective	3-4

Humanities (9 Hours)

Phil.	259	Philosophy Elective	3
		Additional Soc. Sci. and/or Humanities, 500 level or above	6

Home Economics Core (14-15 Hours)

Gen. H.E.	650 120	Dim. of H.E.	1-2
I.Des.	611 101	Des. for Contemp. Living	3
F.&N.	640 133	Food for Man	3
		OR	
F.&N.	640 301	Trends in Food Products	3
F.C. Dev.	620 310	Preschool Child	3
		OR	
F.C. Dev.	620 230	Intro. Human Dev.	3
		OR	
F.C. Dev.	620 272	Helping Relationship	3
		OR	
F.C. Dev.	620 350	Family Relations	3
F. Ec.	630 400	Family Economics	3
Gen. H.E.	650 400	Home Ec. Seminar	1

Supporting Home Economics Courses (9 Hours)

F.&N.	640 132	Basic Nutrition	3
F.C. Dev.	620 310	Preschool Child	3
		OR	
F.C. Dev.	620 650	The Family	3
C.&T.	610 131	Clothing & Society	3
		OR	
C.&T.	610 260	Textiles	3

Family Economics (19 Hours)

F.Ec.	630 405	Personal and Family Finance	3
F.Ec.	630 420	Housing	3
F.Ec.	630 440	Household Equipment	3
F.Ec.	630 460	Family Resource Mgmt. Theory & Application	2
F.Ec.	630 465	Home Management Lab.	2
		OR	
F.Ec.	630 605	Consumer and the Market	3
F.Ec.	630 700	Fam. in Amer. Econ.	3
F.Ec.	630 705	Fin. Prob. of Families	2

Social Work (37 Hours)

Psych.	273 280	Psych. of Child. and Adol.	3
Psych.	273 520	Personality Development	3
Soc.	277 420	Meth. of Soc. Research	4
Soc.	277 550	Group Proc. & Soc. Beh.	3
Soc.	277 565	Prog. & Policy Form.	3
Soc.	277 532	Comm. Organization	3
Soc. Wk.	279 560	Skill & Tech. I	3
Soc. Wk.	279 561	Skill & Tech. II	3
Soc. Wk.	279 562	Field Placement	9
Soc. Wk.	279 564	Prof. Sem. in Soc. Work	3

Concepts in Phys. Ed. 1

Total for Graduation 135

FOODS AND NUTRITION

Jane Raymond Bowers, Head of Department*

Professors Bowers,* Caul,* Fryer,* and Harrison;* Associate Professors Newell* and Reeves;* Assistant Professors Anderson, Phillips, Setser,* and Stone. Emeritus: Professors Finkelstein* and Tinklin;* Associate Professors Browning* and McMillan;* Assistant Professor Mullen.*

The Department of Foods and Nutrition provides two options and interdepartmental programs, which provide specialized instruction for students who wish to become nutritionists, research workers in food and nutrition, dietitians, extension specialists, food editors, food scientists, or work in food companies, developing products, educational materials, and in sales and consumer services.

Two options in foods and nutrition lead to a bachelor's degree: (1) foods and nutrition in business-community service and (2) foods and nutrition science. Students prepare for business or community service under option one. Students interested in food science and nutrition select option two. Basic courses in foods and nutrition are offered for students in other areas of home economics and in other colleges of the University.

The departments of Dietetics, Restaurant and Institutional Management and Foods and Nutrition offer the four-year undergraduate coordinated program in dietetics leading to a B.S. degree and membership in The American Dietetic Association.

Students wishing to fulfill requirements of the Institute of Food Technologists may choose the science option of the curriculum in food science and industry (with a B.S. in food science and industry). This is an interdepartmental program involving the departments of Foods and Nutrition, Animal Sciences and Industry, Grain Science and Industry, and Horticulture.

M.S. and Ph.D. programs are offered by the department. Research and teaching laboratories provide students with excellent equipment. Research assistantships are available to qualified students.

The Department of Foods and Nutrition is a participating member of the graduate program in food science leading to M.S. and Ph.D. degrees.

Courses in Foods and Nutrition

Undergraduate Credit

640 132. Basic Nutrition. (3) I, II, S. Nutritional requirements of man with emphasis on developing judgment in the selection of foods. Not open to students in Foods and Nutrition, Dietetics and Institutional Management, and Home Economics Education. 640-132-0-1306

640 133. Food for Man. (3) I. Food production, distribution, significance and consumption. Nutritional status of world population and local, national and international programs for improvement. 640-133-0-1306

640 300. Meal Management. (3) I, II. Fundamentals of food purchasing and preparation, and meal service with emphasis on nutritional adequacy, aesthetics, and management of money, facilities and human resources. One hour rec. and six hours lab. a week. 640-300-1-1306

640 301. Trends in Food Products. (3) II. Current trends in utilization, consumption, preservation, and market forms of various foods. Food laws, regulation, additives, labeling, and packaging. 640-301-0-1306

640 400. Food Preparation. (3) I, II. Effect of preparation, conditions, and ingredients on physical characteristics of standard food products. One hour rec. and four hours lab. a week. Pr.: Biochem. 120 or Chem. 190 and 191. 640-400-1-1306

Undergraduate And Graduate Credit In Minor Field

640 535. Nutrition and Physical Activity. (3) S. The study of nutrition concepts, physical activity and their interrelationships. Emphasis will be on weight control, fads and fallacies of diet; physical fitness and athletics. Pr.: Biol. 198 and consent of instructor. (Cross-listed with College of Arts and Sciences, see HPER 535.) 640-535-0-1306

Undergraduate And Graduate Credit

640 600. 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 three credits. Pr.: F&N 601, 602, and consent of instructor. 640-600-2-1306

640 601. Food Science. (4) I, II. Preparation of foods as related to their chemical, physical, and organoleptic properties. Two hours rec. and five hours lab. a week. Pr.: Chem. 190 and 191 or 350 and 351, or Biochem. 120. 640-601-1-1306

640 602. Principles of Nutrition. (3) I, II. Functions and interrelationships of various nutrients in the body. Two hours rec. and two hours lab. a week. Pr.: Chem. 190 and 191, or 350 and 351 or Biochem. 120; and Biol. 198. 640-602-1-1306

640 603. Maternal and Child Nutrition. (2-3) II, S. A study of the principles of prenatal, infant, and child nutrition emphasizing the practical application to life situations. Pr.: F&N 132, Biol. 198 or consent of instructor. 640-603-0-1306

640 610. Nutrition Needs Throughout the Life Cycle. (3) I, II. Food patterns, dietary intakes and nutritional requirements of infants, children, adolescents, and adults. Pr.: 120 or 201 or 531, Biol. 240 or 525, F&N 602. 640-610-0-1306
640-610-0-1306

640 612. Principles of Food Product Development and Control. (3) I, S. Food product concept, feasibility and evaluation. Pr.: F&N 601 or consent of instructor. 640-612-0-1306

640 613. Applied Normal Nutrition. (3) I, II. Principles of normal nutrition applied in the hospital and community to the care of children, adults and the aged. Emphasis on professional role of dietitians and techniques of communication. Two credits recitation, one credit of supervised experience. Pr.: Biochem. 120, or 201 or 521, Biol. 240 or 525, F&N 610, consent of instructor. 640-613-2-1306

640 614. Nutrition in Medical Science. (6) I, II. Principles of therapeutic nutrition applied in the care of children, adults and the aged. Supervised clinical experience. Three credits recitation and three credits of supervised experience. Pr.: Biochem. 120, or 201 or 521, Biol. 240 or 525, F&N 610, consent of instructor. 640-614-2-1306

640 615. Nutritional Care of Patients. (6) I, II. Supervised experience in the nutritional care of children, adults and the aged. One credit recitation and five credits of supervised experience. Pr.: Biochem. 120, or 201 or 521, Biol. 240 or 525, F&N 610, consent of instructor. 640-615-2-1306

640 616. 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.: F&N 132 or 602 and 601. 640-616-1-1306

640 620. Sensory Evaluation of Foods. (3) I. 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 2 hours lab. a week. Pr.: F&N 601. 640-602-1-1306

640 680. Seminar in Foods and Nutrition. (2) I. Individual reports and discussion of current topics in foods and nutrition. Pr.: F&N 601 and 602. 640-680-0-1306

640 700. Community Nutrition. (3) I. Organizations and personnel involved in action programs for nutrition; methods for determining and implementing nutrition education programs. Pr.: F&N 132 or 602. 640-700-0-1306

640 712. Diet Therapy. (3) II. Dietary modifications for pathological conditions. Pr.: F&N 602, Biochem. 201 or 521, Biol. 525. 640-712-0-1306

640 750. Nutritional Aspects of Food Processing and Preparation. (3) II alternate years. Stability of nutrients during processing, storage, and preparation of foods from raw food to products for human consumption. Pr.: F&N 601 and 602, Biochem. 200 or 521. 640-750-0-1306.

640 760. Fundamentals of Food Flavor Analysis. (3) I. 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 organoleptic measurement. One hour lec. and six hours lab. a week. Pr.: Chem. 190, 350, or 550; F&N 601. 640-760-1-1306

640 780. 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.: F&N 601 or 602. 640-780-3-1306

640 790. Food Research Techniques. (3) II. Fundamental principles of food quality evaluation and development of an independent research problem. Pr.: F&N 601. 640-790-1-1306

Graduate Credit

640 809. Research Methods in Foods and Nutrition. (3) I or II, on demand. Chemical, biological, and histological methods applicable to research in foods and nutrition. Pr.: F&N 610 and 601, or consent of instructor. 640-809-1-1306

640 811. Advances in Foods. (1-3) S. Recent developments and concerns related to foods. Pr.: F&N 601 and consent of instructor. 640-811-0-1306

640 813. Advances in Nutrition. (1-3) S. Recent developments and concerns related to nutrition. Pr.: F&N 602 and consent of instructor. 640-813-0-1306

640 814. World Nutrition. (1-3) I, Analysis of factors that contribute to malnutrition, effects of under-nutrition and of malnutrition, methods for assessing nutritional status and measures for improvement. Pr.: F&N 602. 640-814-0-1306

640 815. Practicum in Community Nutrition. (3) I, II, S. Supervised experience in community nutrition agencies. Pr.: F&N 700. 640-815-2-1306

640 816. Application of Food Flavor Analysis. (2) II on demand. Application of flavor panel analysis to food research problems. One hour lec. and two hours lab. a week. Pr.: F&N 760. 640-816-1-1306

640 817. Nutrition and Aging. (2-3) II, S. Nature of aging process, nutritional requirements, food habits, and effect of nutrition on the rate of biological aging. Pr.: Nine hours of nutrition, Biol. 525 and Biochem. 521. 640-817-0-1306

640 818. Fundamentals of Meat Processing and Preparation. (1-2) S on demand. Inspection, grading, processing, and preparation in relation to chemical and physical characteristics, costs, safety, quality, and palatability of red meat. Pr.: F&N 601 and conc. enrollment in ASI 818. 640-818-1-1306

640 880. Graduate Seminar in Foods and Nutrition. (1) II. Discussion of investigations in foods and nutrition. May be taken four semesters for credit. Pr.: F&N 790 and 610. 640-880-0-1306

640 890. Readings in Foods and Nutrition. (Var.) I, II, S. Reports and discussions on current research and literature in foods and nutrition and allied areas. Pr.: Consent of instructor. 640-890-3-1306

640 898. Master's Report. (2) I, II, S. Survey in depth of the literature. 640-898-4-1306

640 899. Master's Thesis. (6-8) I, II, S. Research in area of specialization. 640-899-4-1306

640 900. Bionutrition. (3) I, S. Evaluation of nutrient needs of the whole man by integration of knowledge of biochemistry, physiology, and nutrition. Pr.: Biochem. 521, Biol. 525 and F&N 602. 640-900-0-1306

640 901. Advanced Nutrition. (3) II. Current knowledge of metabolic functions of food in the human organism. Pr.: Biochem. 201 or 521, Biol. 525, F&N 602. 640-901-0-1306

640 902. Food Systems. (3) I. Basic scientific principles associated with colloidal systems as applied to food gels and emulsions and to protein food systems. Pr.: Biochem. 521, F&N 601, or consent of instructor. 640-902-1-1306

640 903. Advanced Foods. (3) II. Properties and functions of fats, oils, and starches in food; the structure of batters and doughs; and principles and techniques in food preservation. Two hours rec. and three hours lab. a week. Pr.: Biochem. 201 or 521, and F&N 601. 640-903-1-1306

640 904. Methods of Nutrition Consultation. (3) I or II. Consultation techniques stressing technical and socio-psychological factors in meeting nutritional problems of individuals and agency personnel. Pr.: F&N 712. 640-904-0-1306

640 905. Lipids in Food Systems. (2) S on demand. Physical and chemical characteristics of lipids with emphasis on their behavior and function in food systems. Pr.: Biochem. 521 and F&N 903. 640-905-0-1306

640 906. Proteins in Food Systems. (3) I or II alt. years. Behavior and function of proteins in food systems. Pr.: Biochem. 521 and F&N 902. 640-906-0-1306

640 981. Food Science Colloquium. (1) I. Discussion of investigations in food science. Attendance required of all graduate students in food science. Maximum of two hours may be applied toward an M.S. degree or four hours toward a Ph.D. degree. 640-981-0-1306

640 999. Research in Foods and Nutrition. (Var.) I, II, S. Three hours a week for each hour of credit. Pr.: Consent of instructor. 640-999-4-1306

Curriculum in Food Science And Industry

Science option—joint program with Colleges of Agriculture and Home Economics

B.S. in food science and industry

Students wishing to fulfill the requirements for the Institute of Food Technologists may choose this option. Food scientists are concerned 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 applications of food theory within a flexible program that permits each student to tailor his or her education to fit personal career goals.

Liberal-General Education Courses, 23 Hours

Engl.	229 100	English Comp. I	3
Engl.	229 120	English Comp. II	3
Speech	2B1 105	Oral Communication I	2
Math.	245 100	College Algebra	3
Econ.	225 110	Economics I	3
		Electives in Social Science or Humanities	9

Biological Science, 8 Hours

Biol.	215 19B	Prin. of Biology	4
Biol.	215 555	Microbiology	4

Physical Science, 37 Hours

Biochem.	211 521	Gen. Biochem.	3
Biochem.	211 522	Gen. Biochem. Lab.	2
Chem.	221 210	Chemistry I	4
Chem.	211 230	Chemistry II	4
Chem.	211 271	Chem. Analysis	4
Chem.	221 350	Gen. Org. Chem.	3
Chem.	221 351	Gen. Org. Chem. Lab.	2
Math.	245 150	Plane Trig.	3
Math.	245 220	Anal. Geom. & Calc. I	4
Physics	265 113	Gen. Physics I	4
Physics	265 114	Gen. Physics II	4

Home Economics Core
Choose 6-B Hours

I. Des.	611 101	Design for Contemp. Living	3
F.C. Dev.	620 310	The Preschool Child	3
		OR	
F.C. Dev.	620 230	Intro. Human Development	3
		OR	
F.C. Dev.	620 272	The Helping Relationship	3
		OR	
F.C. Dev.	620 350	Family Relationships	3
F.Ec.	630 400	Family Economics	3
F.&N	640 132	Basic Nutrition	3
		OR	
F.&N	640 133	Food for Man	3
		OR	
F.&N	640 301	Trends in Food Products	3
General H.E.	650 120	Dimensions of Home Ec.	1-2
General H.E.	650 400	Home Ec. Seminar	1

Professional Courses, 23-24 Hours

ASI	020 305	Fund. of Food Processing	3
ASI	020 311	Intr. Food Chemistry	3
Gen. Ag.	035 301	Intro. to Food Sc. & Tech.	3
Gr. Sc.	045 651	Food and Feed Plant Sanitation	4
		OR	
ASI	020 690	Practical Quality Control of Dairy and Food Products	3
Biol.	215 520	Microbiology of Foods	4
F.&N	640 601	Food Science	4
F.&N	640 602	Prin. of Nutrition	3

Professional Electives, 14-17 Hours
Choose 5-8 hours of the following.

ASI	020 250	Elements of Meat Processing	2
		AND	
ASI	020 261	Meat Processing (conc. assign.)	1
ASI	020 720	Meat-Packing Plant Oper.	2
ASI	020 777	Meat Technology	3
ASI	020 401	Fund. of Milk Proc. & Sant.	3
ASI	020 501	Prin. of Dy. Foods Proc.	3
ASI	020 505	Prin. of Dy. Foods Proc. Lab	1-3
ASI	020 700	Poultry Prod. Tech.	3
Hort	040 792	Harvesting, Handling, and Processing of Fruits and Vegetables	3
Gr. Sc.	045 120	Intr. Bakery Tech.	2
Gr. Sc.	045 635	Baking Science I	2
Gr. Sc.	045 636	Baking Science I Lab.	2
Gr. Sc.	045 715	Fund. Processing Grain for Food	3

and a minimum of 9 hours of the following:

Ag. Ec.	010 514	Econ. of Food Marketing	3
ASI	020 550	Dairy Bacteriology	4
ASI	020 715	Chem. of Foods	3
Gr. Sc.	045 300	Cereal and Feed Analysis	3
Gr. Sc.	045 602	Cereal Science	3
Gr. Sc.	045 661	Qualities of Food & Feed Ingredients	3
Gr. Sc.	045 700	Adv. Cereal Chemistry	3
Gr. Sc.	045 711	Prin. of Food Analysis	3
Biol.	215 201	Organismic Biology	5
Biol.	215 525	Human Physiology	4
Stat.	2B5 340	Biometrics I	3
C. Sci.	2B6 200	Fund. of Computer Prog.	2
C. Sci.	2B6 201	Language Lab	1
Ag. E.	506 555	Dairy Mechanics	3
F.&N.	640 301	Trends in Food Products	3
F.&N.	640 610	Nutr. Needs Throughout Life Cycle	3
F.&N.	640 760	Fund. of Food Flavor Analysis	3
F.&N.	640 790	Food Res. Techniques	3
Anat. & Ph.	740 530	Anat. & Physiology	4

Unrestricted Electives, 9-15 Hours

Other

Concepts in Phys. Ed.	1
Total for Graduation	127

Option In Foods And Nutrition Science

Department of Foods and Nutrition

Students prepare for positions in research laboratories, as home economists in test kitchens, food product development laboratories, or food promotional agencies, or as nutritionists in business or governmental agencies. Students will be well prepared for graduate study. See page 289 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Biol.	215 19B	Prin. of Biology	4
Biol.	215 555	Microbiology	4
Biology	215 240	Human Body	6
Math.	245 100	College Algebra	3
		OR	
Math.	245 220	Anal. Geom. & Calc. I	4
		Humanities Electives	6
Physics	265 115	Descriptive Physics	4

Supporting Courses

Chemistry	221 210	Chemistry I	4
Chemistry	221 230	Chemistry II	4
Chemistry	221 350	Gen. Org. Chem.	3
Chemistry	221 351	Gen. Org. Chem. Lab	2
Chemistry	221 271	Chemical Analysis	4
Biochemistry	211 521	Gen. Biochemistry	3
Biochemistry	211 522	Gen. Biochemistry Lab	2

Unrestricted Electives **15-17**

Professional Courses

F.&N.	640 301	Trends in Food Products*	3
F.&N.	640 300	Meal Management	3
F.&N.	640 601	Food Science	4
F.&N.	640 602	Prin. of Nutrition	3
F.&N.	640 680	Seminar in Foods and Nutrition	2
F.&N.	640 610	Nutr. Throughout Life Cycle	3
F.&N.	640 790	Food Research Tech.	3
		Nutrition Elective	3
		Foods and Nutr. Elective	6

Unrestricted Electives **15-17**

* If taken in the Home Economics Core, take Foods & Nutr. elective.

Option In Foods And Nutrition In Business-Community Service

Department of Foods and Nutrition

Graduates take positions with food processors, food promotional agencies, utility companies, other business organizations, and community service agencies. Home economists in these positions do educational work, giving demonstrations and illustrated talks, writing food columns for newspapers; work in sales, public relations, and consumer services; and as nutrition consultant for community service agencies. See page 289 for further departmental information.

Option requirements in addition to courses in basic curriculum:

Liberal-General Education Courses

Biochemistry	211 201	Elem. Biochemistry	3
		Principle of Biology	3
Biology	215 240	Human Body	6
Biology	215 555	General Microbiology	4
Chemistry	221 110	Gen. Chem.	5
Chemistry	221 190	El. Org. Chem. with	3
Chemistry	221 191	El. Org. Chem. Lab.	2
Math	245 100	College Algebra	3
		OR	
Math	245 220	Analytic Geometry & Calc. I	4
		Humanities Elective (minimum)	6

CHOOSE ONE OF THE PROFESSIONAL AREAS:

Business-Communication Area

Bus. Ad.	305 440	Marketing	3
JMC	289 630	Public Relations	3
		Business and/or Communications Electives	12-13
F.&N.	640 300	Meal Management	3
F.&N.	640 301	Trends in Food Products*	3
F.&N.	620 601	Food Science	4
F.&N.	640 602	Prin. of Nutrition	3
F.&N.	640 610	Nutr. Needs Throughout Life Cycle	3
F.&N.	640 616	Princ. Foods Demonstration	3
F.&N.	640 680	Seminar Foods and Nutrition	2
F.&N.	640 790	Food Research Techniques	3
		Foods and Nutrition or Related Electives	6

Unrestricted Electives **9-12**

Community Nutrition Area

		Communications Electives	3-9
		Family & Child Dev. and/or Soc. Sci. Electives	6-9
		Family Economics Electives	3-9
F.&N.	640 300	Meal Management	3
F.&N.	640 301	Trends in Food Products*	3
F.&N.	640 600	Practicum in Foods and Nutr.	3-5
F.&N.	640 601	Food Science	4
F.&N.	640 602	Principles of Nutrition	3
F.&N.	640 610	Nutr. Needs Thoughout Life Cycle	3
F.&N.	640 680	Seminar Foods & Nutr.	2
F.&N.	640 700	Community Nutr.	3
F.&N.	640 712	Diet Therapy	3

Unrestricted Electives **11-15**

***If taken in Home Economics Core, take F&N Elective**



College of Veterinary Medicine

Donald M. Trotter, Dean*
John L. Noordsy, Assistant Dean*

Requirements For Admission To The College Of Veterinary Medicine

Enrollment in the College of Veterinary Medicine is limited to 105 well-qualified students after a minimum of two years of college work including the required 64 hours of pre-veterinary medical courses (see pre-veterinary medical requirements). The 105 students are selected from 1,000 plus applicants, with preference to Kansans. A student must have at least a B (3.0) average over the pre-professional requirements and the last 45 hours of undergraduate college work in order to be interviewed for selection. Non-residents from contract states need to 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. In recent years the majority of the successful candidates have had over four years of pre-veterinary training.

Selection for admission to the professional program in veterinary medicine will be on individual merit from qualified applicants as listed above, who are graduates of Kansas high schools and who, with their parents, have maintained residence in Kansas, or: who together with their parents are residents of Kansas and have been residents for at least three years immediately prior to first semester enrollment of the year for which they are applying, or: who have been wholly independent residents of Kansas for five years immediately prior to first semester enrollment of the year for which they are applying. After Kansans are selected, non-residents from states with which K-State has a contract for reimbursement (Arizona, Arkansas, Hawaii, Nebraska, Nevada, New Jersey, New Mexico, North Dakota, Oregon, Puerto Rico, South Dakota, Utah and Wyoming) will be selected. The three- and five-year requirements mentioned previously may be fulfilled concurrently with the pre-veterinary years.

Non-residents from states having colleges of veterinary medicine will not be considered. These students should seek admission in their home states.

On October 1 applications for admission to the professional curriculum may be obtained from the Assistant Dean of the College of Veterinary Medicine for consideration in the next class.

No applications are accepted after January 15 from off-campus students or after February 1 from Kansas State University students.

Pre-Veterinary Medical Requirements

The pre-veterinary medical work may be pursued at Kansas State University in the College of Arts and Sciences or the College of Agriculture or in any approved junior college or university.

Course	Semester Hours
English Composition I	3
English Composition II	3
Chemistry I	4
Chemistry II	4
Chemical Analysis	4
General Organic Chemistry	5
Principles of Animal Science	3
Animal Science & Industry	1
Oral Communications	2
Physics I and II	8
Trigonometry	3
General Zoology or Principles of Biology	4
Genetics	3
Dairy Science	1
Poultry Science	1
Social Science and/or Humanities Electives	12
Electives*	1-3
Total Semester Hours	64

*Number depending on selection of other courses.

A Kansas State University student who completes the pre-veterinary curriculum in the College of Arts and Sciences or the College of Agriculture** may be awarded a Bachelor of Science degree after successful completion of the second year in the professional veterinary medical curriculum.

Veterinary Medical Library

The College of Veterinary Medicine has a well-equipped library consisting of approximately 17,000 volumes which deal with all phases of veterinary medical literature and many allied fields. It subscribes to 700 journals and has a large audio-visual collection of over 1,000 items. Numerous additional textbooks and journals are available at the main library on campus.

Fees For Veterinary Medical Students

Assessments (Per semester (if enrolled in more than six hours))	Kansas Residents or Staff Members	Non-residents
1. Incidental	$305.00	$825.00
2. Student Health	40.00	40.00
3. Student Union Annex I	2.25	2.25
4. Student Union Annex II	10.25	10.25
5. Student Activities (incl. Union operations)	24.25	24.25
6. Stadium Bonds	4.25	4.25
7. Student Recreation Building	12.00	12.00
Total for Veterinary Medical Students	$398.00	$918.00

**Those receiving the B.S. degree in Agriculture must use Ag Orientation one hour for one hour of their electives.

Doctor of Veterinary Medicine Curriculum

The curriculum in veterinary medicine at Kansas State University was established to give young men and women of this state an opportunity to pursue these studies in an environment where the facilities offered by other branches of the University would be at their command. To fit the veterinarian to deal with the livestock problems that must be met, one is required to take work in livestock feeding, breeding, judging, poultry, milk and dairy inspection, chemistry, bacteriology, parasitology, and zoology, in addition to purely professional work.

Work must be taken as prescribed, except that certain courses may be selected from extracurricular electives if the student has the prerequisites.

While not required, third year students are encouraged to accept summer internships with practicing veterinarians, federal and state regulatory forces.

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-veterinary medical requirements."

The carefully planned two or two and one-half year pre-veterinary program plus the four year (total of at least six years) professional curriculum may lead to the two degrees, Bachelor of Science and Doctor of Veterinary Medicine. (Hours required for graduation: pre-veterinary—64; professional—152; total—216.)

FIRST PROFESSIONAL YEAR

Fall Semester		Course	Semester Hours
Anatomy & Physi.	740 700	Gross Anatomy I	7
Anatomy & Physi.	740 710	Micro. Anatomy I	5
Anatomy & Physi.	740 737	Veterinary Physiology I	6
Anatomy & Physi.	740 740	Veterinary Orientation	1
			19

Spring Semester		Course	Semester Hours
Anatomy & Physi.	740 705	Gross Anatomy II	5
Anatomy & Physi.	740 715	Micro. Anatomy II	3
Anatomy & Physi.	740 747	Veterinary Physiology II	8
Anatomy & Physi.	740 840	Methods of Physi. Exam.	1
Surgery & Med	750 810	Propaedeutic Medicine	2
			19

SECOND PROFESSIONAL YEAR

Fall Semester		Course	Semester Hours
Infectious Diseases	720 710	Vet. Microbiology I	5
Infectious Diseases	720 793	Vet. Parasitology	5
Pathology	730 703	General Pathology	5
Anatomy & Physi	740 770	Pharmacology	4
			19

Spring Semester		Course	Semester Hours
Infectious Diseases	720 720	Vet. Microbiology II	5
Infectious Diseases	720 775	Clinical Pathology	3
Pathology	730 710	Systemic Pathology	5
Surgery & Med	750 805	Surgery I	3
Surgery & Med.	750 820	Theriogenology	3
			19

THIRD PROFESSIONAL YEAR

Fall Semester		Course	Semester Hours
Infectious Diseases	720 800	Clinic I	2
Pathology	730 800	Clinic I	
Surgery & Med.	750 800	Clinic I	
Anatomy & Physi.	740 720	Anatomy III	2
Anatomy & Physi.	740 886	Comparative Nutrition	5
Surgery & Med	750 886	Comparative Nutrition	
Surgery & Med.	750 814	Small Animal Surgery	3
Surgery & Med.	750 821	Companion Animal Med	4
Surgery & Med.	750 824	Food Animal Med	4
			20

Spring Semester		Course	Semester Hours
Infectious Diseases	720 752	Epidemiology & Zoonoses	3
Infectious Diseases	720 803	Clinic II	2
Pathology	730 803	Clinic II	
Surgery & Med	750 803	Clinic II	
Pathology	730 847	Avian Medicine	3
Surgery & Med.	750 811	Large Animal Surgery	4
Surgery & Med.	750 830	Medicine I	5
Surgery & Med.	750 840	Radiology	3
			20

FOURTH PROFESSIONAL YEAR

Fall Semester		Course	Semester Hours
Infectious Diseases	720 754	Food Quality Control	4
Infectious Diseases	720 823	Clinical Medicine I	6
Pathology	730 823	Clinical Medicine I	
Surgery & Med.	750 823	Clinical Medicine I	
Surgery & Med.	750 850	Medicine II	4
Surgery & Med	750 895	Toxicology	4
			18

Spring Semester		Course	Semester Hours
Infectious Diseases	720 824	Clinical Medicine II	6
Pathology	730 824	Clinical Medicine II	
Surgery & Med.	750 824	Clinical Medicine II	
Pathology	730 859	Lab. Animal Science	3
Anatomy & Physi.	740 775	Clinical Pharmacology	2
Surgery & Med.	750 870	Medicine III	4
Surgery & Med.	750 883	Practice Management	3
			18

Departments & Course Offerings

INFECTIOUS DISEASES

E.H. Coles, Jr., Head of Department*

Professors Coles,* Kelley,* Leland,* Lindquist,* and Minocha;* Associate Professors Bailie,* Burroughs,* Keeton,* and Moore.* Instructor Hoffman. Emeritus: Professors Leasure and Kitselman; Instructor Kimball.

Courses in parasitology, microbiology, 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 degrees Master of Science and work toward the Doctor of Philosophy is offered in the interdepartmental group in pathology. (See description in Graduate School section.) Work at the graduate level includes advanced courses in clinical pathology, parasitology, microbiology, and public health.

Courses in Infectious Diseases

Undergraduate And Graduate Credit

720 645. Veterinary Mycology. (3) I in odd 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, Path. 710. 720-645-1-1218

720 650. Fundamentals of Veterinary Public Health. (3) II. Organization and function of food inspection services; zoonoses as related to foods of animal origin. Three hours rec. a week. Pr.: Biol. 198 and consent of staff. 720-650-0-1218

720 710. Veterinary Microbiology I. (5) I. A study of host-parasite interaction and principles of immunology. Three hours rec. and four hours lab. a week. Pr.: A. & P. 730 or consent of instructor. 720-710-1-1218

720 715. Experimental Parasitology. (3) I in even years. Planning, execution, analysis and reporting of experiments in parasitology. Techniques concerning interaction between host and parasite, in vitro cultivation, tracers, anthelmintic evaluation. Pr.: Consent of instructor and two semesters of parasitology. 720-715-2-1218

720 720. Veterinary Microbiology II. (5) II. Morphology, biology, classification of pathogenic microorganisms and their study in relation to the cause of disease. Three hours rec. and four hours lab. a week. Pr.: Inf. Dis. 710 or consent of instructor. 720-720-1-1218

720 752. Epidemiology and Zoonoses. (3) II. The epidemiologic principles of infectious and noninfectious diseases; consideration of the bacterial, viral, parasitic and mycotic diseases shared by man and animals. Three hours lec. a week. Pr.: Third year standing in College of Veterinary Medicine. 720-752-0-1218

720 754. Food Quality Control. (4) I. The role of the veterinarian in processing, handling, storage, and evaluation of foods of animal origin, including regulatory requirements, animal testing procedures, shipment, and quarantine of food animals. Four hours lec. a week. Pr.: Fourth year standing in the College of Veterinary Medicine. 720-754-0-1218

720 775. 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. 720-775-1-1218

720 790. Veterinary Hematology. (3) II in odd years. A detailed study of the blood of domestic animals. Emphasis is placed on the species variabilities. Two hours lec. and three hours lab. a week. Pr.: Inf. Dis. 775 or consent of instructor. 720-790-1-1218

720 793. 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. 720-793-1-1218

Graduate Credit

720 800, 720 803. Clinic I (2) **and II.** (2) I and II respectively. Instruction in laboratory procedures as related to examination and treatment of patients (jointly with 750 800 and 750 803). Pr.: Third year standing in College of Veterinary Medicine. 720-800-1-1218, 720-803-1-1218

720 810. Problems in Infectious Diseases. (1-6) I, II, S. Work is offered in infectious diseases including parasitology, clinical pathology, virology, bacteriology, food hygiene. Pr.: Consent of instructor. 720-810-3-1218

720 820. Advanced Clinical Pathology. (3) II in even years. Further studies and application of the more detailed laboratory procedures and tests in hematologic, serologic, bacteriologic, chemical and pathologic diagnosis. Pr.: Path. 849 and consent of staff. 720-820-1-1218

720 823, 720 824. Clincial Medicine I (6) **and II.** (6) I and II respectively. Instruction in laboratory procedures and interpretation of results; laboratory and field experience in epidemiology and public health (jointly with 750 823 and 750 825). Pr.: Fourth year standing in College of Veterinary Medicine. 720-823-1-1218, 720-824-1-1218

720 825. Pathology of Body Fluids. (3) I. A detailed study of the alterations of the components of body fluids occurring in disease processes, and interpretations of these changes. Pr.: Inf. Dis. 820 or consent of staff. 720-825-1-1218

720 830. Infectious Disease Seminar. (1) I, II, S. Designed primarily for graduate and veterinary students interested in infectious diseases. Each student is required to give reports on subjects related to infectious diseases. 720-830-0-1218

720 835. 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.: Inf. Dis. 753, Med. 870. 720-835-0-1218

720 850. 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 two semesters of parasitology. 720-850-2-1218

720 860. Advanced Veterinary Bacteriology. (3) I in alt. years. The detailed study of the classification, morphology, biochemical and differential characteristics permitting identification of the bacteria of veterinary medical significance. One hour rec. and six hours lab. a week. Pr.: Inf. Dis. 720, Biol. 610 or equiv. 720-860-1-1218

720 865. Diagnostic Veterinary Virology. (3) I in alt. 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.: Inf. Dis. 720, Biol. 730 or equiv. 720-865-1-1218

720 875. Advanced Food Hygiene. (3) I, II, S. Further studies of the more recent detailed procedures used in the preservation and sanitary control of manufactured products prepared from seafood, poultry, animal meat, and dairy products. Two hours lec. and three hours lab. a week. Pr.: Inf. Dis. 753. 720-875-1-1218

720 880. Principles and Techniques of Research in Medical Investigations. (4) I, S. A study of the procedures in planning and evaluating medical experiments and the use of special research instruments in medical research. Three hours rec. and three hours lab. a week. Pr.: Path. 703, A. & P. 745. 720-880-1-1218

720 899. Research in Infectious Diseases. (1-6) I, II, S. Individual research in infectious diseases. Pr.: Consent of instructor. This work may form the basis for the Master's thesis and the Ph.D. dissertation. 720-899-4-1218

PATHOLOGY

S.M. Dennis, Head of Department*

Professors Cook,* Dennis,* and Leipold;* Associate Professors Smith,* Strafuss,* and Kruckenberg;* Assistant Professor Seefeldt.

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 degree 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.

Courses in Pathology

Undergraduate And Graduate Credit

730 500. Topics In Comparative Pathology. (1-3) I, II, S. Selected topics in diseases of laboratory animals, wildlife, and fish for nonveterinary students. Pr.: Biol. 198 or equiv. 730-500-1-1218

730 501. Diseases of Wildlife. (3) I. Infectious and noninfectious diseases of birds, fur-bearing animals, zoological animals, and fish with reference to methods of prevention and control. Three hours lec. a week. Pr.: Biol. 198 or equiv. 730-501-0-1218

730 703. 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. 730-703-1-1218

730 710. 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.: Path. 703. 730-710-1-1218

Graduate Credit

730 800, 730 803. Clinic I (2) **and II.** (2) I and II respectively. Instruction in necropsy procedures. (Jointly with 750 800 and 750 803.) Pr.: Third year standing in College of Veterinary Medicine. 730-800-1-1218, 730-803-1-1218

730 823, 730 825. Clinical Medicine I (6) **and II.** (6) I and II respectively. Experience in the necropsy laboratory. (Jointly with 750 823 and 750 825.) Pr.: Fourth year standing in College of Veterinary Medicine. 730-823-1-1218, 730-825-1-1218

730 845. Advanced Diagnostic Pathology. (3) I, S. Study of pathologic alterations of disease with emphasis on diagnostic characteristics. Pr.: Path. 710 and consent of instructor. 730-845-1-1218

730 847. Avian Medicine. (3) II. The prevention, diagnosis and treatment of avian diseases. Three hours lec. a week. Pr.: Third year standing in College of Veterinary Medicine. 730-847-0-1218

730 848. Avian Pathology. (2) II. Study of etiology, pathogenesis, gross and microscopic characteristics of avian diseases. Pr.: Path. 847 or consent of instructor. 730-848-1-1218

730 849. Pathological Technique and Diagnosis. (3) I, II, S. Practical experience in mammalian necropsy, avian necropsy, clinical pathology, histologic techniques, and diagnostic laboratory procedures. Pr.: Path. 710 and consent of staff. 730-849-1-1218

730 850. Perinatal Pathology. (2) S. Study of placental and fetal lesions of congenital infections in domestic animals. Pr.: Path. 845. 730-850-1-1218

730 851. Advanced Principles of Pathology. (3) II in even years. 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.: Path. 710 and consent of instructor. 730-851-1-1218

730 852. Surgical Pathology. (1-2) I, II, S. Practical experience in examining and processing surgical biopsy specimens and writing histopathological reports. Pr.: Path. 845. 730-852-1-1218

730 855. Oncology. (3) II in odd years. Etiology, behavior, gross, microscopic characteristics, identification and prognosis of tumors. Pr.: Path. 845 and consent of staff. 730-855-1-1218

730 857. Developmental Pathology. (2) I in even years. A bridging course between embryology and pathology with emphasis on congenital defects in domestic animals. Pr.: Path. 710 and consent of instructor. 730-857-1-1218

730 858. Medical Genetics. (3) I in even years. Study of genetic diseases of domestic animals with emphasis on chromosomal observations, biochemical factors and hereditary patterns in transmission. Pr.: 730 845 or equiv. 730-858-1-1218

730 859. Laboratory Animal Science. (3) II. Consideration of the management and health of common species of laboratory animals. Three hours lec. a week. Pr.: Fourth year standing in College of Veterinary Medicine. 730-859-0-1218

730 860. Pathology of Diseases of Laboratory Animals, Fish and Wildlife. (3) I in even years. Pathology of diseases affecting laboratory animals, fish and wildlife. Pr.: Path. 845 and consent of instructor. 730-860-1-1218

730 862. Histopathological and Photographic Techniques. (2) II in odd years. Principles of routine histopathological techniques with emphasis on special stains, together with principles of light microscopy with emphasis on obtaining optimal black and white and color photomicrographs. Pr.: Path. 845 or consent of staff. 730-862-1-1218

730 865. Advanced Topics in Comparative Pathology. (1-3) I, II, S. Selected topics to assist pathology majors in their areas of specialization. Pr.: Path. 845. 730-865-1-1218

730 870. Pathology Seminar. (1) I, II, S. Pr.: Consult department head. 730-870-0-1218

730 880. 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.: Path. 710 and consent of instructor. 730-880-2-1218

730 885. 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 (M.S.) and ten credit hours (Ph.D.). Pr.: Path. 845 or consent of staff. 730-885-3-1218

730 899. Research in Pathology. (1-6) I, II, S. Individual research in the pathology of animal disease. Pr.: Path. 710, 849. This work may form the basis for the Master's thesis and the Ph.D. dissertation. 730-899-4-1218

730 947. 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.: Path. 845. 730-947-1-1218

730 950. Advanced Systemic Pathology II. (5) II in even years. Study of etiology, pathogenesis, gross, and microscopic characteristics and systemic effects of diseases of the skin, musculoskeletal, genital and nervous systems, and special senses. Pr.: Path. 947. 730-950-1-1218

730 965. Cellular and Molecular Pathology. (4) I. 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. 730-965-0-1218

730 966. Cellular and Molecular Pathology Lab. (1) I, II, S. Basic techniques used in the study of cellular and molecular pathology. Pr.: Path. 965 or concurrent enrollment and consent of instructor. 730-966-1-1218

730 970. Pathology Seminar. (1) I, II, S. Pr.: Consult department head. 730-970-0-1218

730 980. 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.: Path. 710 and consent of instructor. 730-980-2-1218

730 985. 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 (M.S.) and ten credit hours (Ph.D.). Pr.: Path. 845 or consent of staff. 730-985-3-1218

730 999. Research in Pathology. (1-6) I, II, S. Individual research in the pathology of animal disease. Pr.: Path. 710, 849. This work may form the basis for the Master's thesis and the Ph.D. dissertation. 730-999-4-1218

ANATOMY AND PHYSIOLOGY

R.A. Frey, Head of Department

Professors Clarenburg,* Fedde,* Frey,* Oehme,* Trotter,* Upson,* and Westfall;* Associate Professors Chapman,* Kiemm,* Quadri,* and Weinman;* Assistant Professor Gatz,* Hartke,* and Kiorpes; Instructors Johnson and Miller-Davis. Emeritus: Professor Underbjerg.

The Department of Anatomy and Physiology presents courses in the areas of physiology, pharmacology, physiological chemistry, gross anatomy, and microscopic anatomy at both the undergraduate and graduate levels.

Biophysical electronic instrumentation, two electron microscopes, environmental chambers, scintillation counter, 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 is offered for undergraduate and graduate students outside the field of veterinary medicine.

Courses in Anatomy and Physiology

Undergraduate And Graduate Credit In Minor Field

740 530. Anatomy and Physiology. (4) II. General anatomy and physiology of the domestic animals. Three hours rec. and three hours lab. a week. 740-530-1-1218

740 531. Introduction to Pharmacology of Farm Animals. (2) Interim semester. The study of the basic principles of pharmacology as related to the proper and safe use of drugs and chemicals by the livestock industry. Pr.: A. & P. 530 or equivalent. 740-531-0-1218

Undergraduate And Graduate Credit

740 700. Gross Anatomy I. (7) I. Dissection of the body cavities, limbs, head, neck and genital organs of the dog. Three hours rec. and twelve hours lab. a week. Pr.: First year standing in College of Veterinary Medicine. 740-700-1-1218

740 705. Gross Anatomy II. (5) II. Dissection of the body cavities, limbs, head, and neck of the horse and the ruminant. Parallel comparative studies on laboratory animals, pigs, chickens and cats. Two hours rec. and nine hours lab. a week. Pr.: A. & P. 700. 740-705-1-1218

740 710. 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. 740-710-1-1218

740 715. Microscopic Anatomy II. (3) II. Origin, development and microscopic structure and appearance of the cells and tissues of the animal body. One hour lec. and six hours lab. a week. Pr.: A. & P. 710. 740-715-1-1218

740 720. Anatomy III. (2) I. Dissections and demonstrations of regions of diagnostic and surgical importance. One hour lec. and two hours lab. a week. Pr.: Third year standing in College of Veterinary Medicine. 740-720-1-1218

740 737. Veterinary Physiology I. (6) I. Physiological functions at the molecular and various structural levels in domestic animals are integrated. Physiological control mechanisms, criteria for evaluating animal health, and conditions leading to loss of control are emphasized. Four hours rec. and six hours lab. a week. Pr.: First year standing in College of Veterinary Medicine. 740-737-1-1218

740 740. Veterinary Orientation. (1) I. Lectures on introduction to veterinary medicine. One hour lec. a week. Pr.: First year standing in College of Veterinary Medicine. 740-740-0-1218

740 747. Veterinary Physiology II. (8) II. Function and control of nervous, muscular, respiratory, cardiovascular, endocrine, reproductive, digestive and renal systems of domestic animals. Six hours lec. and six hours lab. a week. Pr.: A. & P. 737 and A. & P. 700 or consent of instructor. 740-747-0-1218

740 748. Methods of Physiological Examination. (1) II. Techniques for determination of the functional status of body systems of domestic animals. Two hours lab. per week. Pr.: Second semester, first year standing in College of Veterinary Medicine. 740-748-1-1218

740 770. Pharmacology. (4) I. The history, source, physical and chemical properties, compounding, biochemical and physiological effects, mechanism of action, absorption, distribution, biotransformation and excretion, therapeutic and other uses, and toxicity of drugs. Three hours rec. and three hours lab. a week. Pr.: A. & P. 737 and 747 or equiv. 740-770-1-1218

740 775. Clinical Pharmacology. (2) II. The application of the basic principles of pharmacology to the proper use of a single drug or multiple drug regimens to veterinary medical and surgical patients. Two hours lec. a week. Pr.: Fourth year standing in College of Veterinary Medicine. 740-775-0-1218

Graduate Credit

740 803. 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 evaluate data. One hour a week. Pr.: Consent of staff. 740-803-0-1218

740 812. Canine Anatomy. (2-4) I, II, S. Pr.: Consent of staff. 740-812-3-1218

740 825. Special Anatomy. (Var.) I, II, S. The study of any part of the horse (as the digestive or reproductive system), ox, sheep, pig, dog, cat or chicken. Pr.: A. & P. 700, 705 or equiv. 740-825-3-1218

740 850. Anatomical Techniques. (1-2) I in odd years, S. Pr.: Consent of staff. 740-850-3-1218

740 855. Comparative Physiology. (3) II. Comparisons of physiological functions in the animal kingdom, including respiration, circulation, digestion, excretion, locomotion and control. Pr.: Biol. 201, A. & P. 530 or equiv. 740-855-0-1218

740 860. Neuroscience. (2) I. An advanced multidisciplinary study of the central nervous system, including neurochemistry, neuropharmacology, neuroanatomy, neurophysiology, clinical neurology, and behavioral science. Pr.: Consent of staff. 740-860-0-1218

740 865. 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.: A. & P. 747 and consent of staff. 740-865-1-1218

740 885. 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. 740-885-0-1218

740 886. Comparative Animal Nutrition. (5) I. A study of the veterinary medical aspects of nutrition including principles of feeding and nutrition of common domestic species of food producing and companion animals; consideration of material relative to therapeutic nutrition as related to clinical management of diseased and convalescent animals. Pr.: Third year standing in College of Veterinary Medicine or A.S.I. 700. 740-886-0-1218

740 890. Problems in Pharmacology and Toxicology. (Var.) I, II, S. Individual investigation into the interactions of chemical compounds and living systems. Pr.: A. & P. 770, or Surg. & Med. 895, or equiv. 740-890-4-1218

740 898. Master's Report. (2) I, II, S. Pr.: Consent of staff. 740-898-4-1218

740 899. Research. (1-4) I, II, S. For graduate students in the field of anatomy working toward the M.S. degree. Pr.: Consent of staff. 740-899-4-1218

740 900. 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.: A. & P. 747 and consent of staff. 740-900-0-1218

740 915. 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. 740-915-0-1218

740 925. 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.: A. & P. 747 and consent of staff. 740-925-1-1218

740 995. 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. 740-995-4-1218

740 999. Research in Physiology. (1-6) I, II, S. For graduate students working toward the M.S. or Ph.D. degree. Pr.: Consent of staff. 740-999-4-1218

SURGERY AND MEDICINE

J.E. Mosier, Head of Department*

Professors Anderson,* Butler,* Guffy,* Mosier,* Noordsy,* Oehme* and Railsback;* Associate Professors Blauch,* Carnahan, Harris,* Schneider, Schoneweis,* Taussig, and Vestweber;* Assistant Professors Bean, Beeman, Brandt, Fortney, Gabbert, Jernigan, Morris, and Samuelson; Instructors Bostwick, Easley, Edwards, Genetsky,* Guiney, Mount, Neer, and Spire. Emeritus: Professors Frank and Frick.

The University Veterinary Hospital is equipped exceptionally well for diagnosis and treatment of animal disease and for instruction of students in the science and art of veterinary medicine.

The hospital has a capacity of 82 large animal patients and 150 small animal patients. Members of the clinical staff, accompanied by students, conduct a field service for the purpose of programming animal health and for diagnosing and treating the various diseases affecting livestock and poultry. Consultation services result in frequent referral cases or investigational trips.

Third- and 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 within the clinical and pathology staffs. In addition to daily assignments, third- and fourth-year students are required to serve a two-week internship in the veterinary hospital, during which time they are responsible for the various management phases of the hospital.

The department presents courses in medicine, surgery, toxicology, obstetrics and gynecology to veterinary students.

Opportunities leading to the Master of Science degree are offered. Prerequisite to graduate work in the department is the completion of a four-year curriculum substantially equivalent to that required of students majoring in veterinary medicine at this University.

Excellent library facilities, physical equipment, and an abundance of cases offer excellent resources for research in surgery and medicine.

Courses in Surgery

Graduate Credit

750 802. Research in Surgery. (1-6) **I, II, S.** The objectives of the course are to attempt to solve problems confronting the veterinary surgeon. Pr.: Anat. 700, 705, 720; Surg. 805, 811, 814. Offered especially for graduates in veterinary medicine. 750-802-4-1219

750 805. 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. 750-805-0-1218

750 811. 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 College of Veterinary Medicine. 750-811-0-1218

750 814. 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. 750-814-0-1218

750 832. 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. 750-832-3-1219

750 867. The Physiologic Effects of Surgery. (3) II in even years. A study of the effects of surgery on the different body systems. Pr.: D.V.M. degree or consent of department head. 750-867-3-1219

750 872. 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. 750-872-3-1219

750 877. 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. 750-877-3-1219

750 887. 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 his major professor outlines the methodology and precedures, conducts the study, and prepares a detailed report. Pr.: D.V.M. 750-887-3-1219

Courses in Medicine

Undergraduate Credit

750 235. 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** 101 or equiv., A. & P. 530, and sophomore standing. 750-235-0-1219

Graduate Credit

750 800, 750 803. Clinic I. (2) **and II.** (2) I and II respectively. Instruction in operation of the outpatient clinic; participation in the receipt, restraint, examination and treatment of the patient and in ancillary services of the animal hospital. Six hours lab. a week. Pr.: Third year standing in College of Veterinary Medicine. 750-800-1-1218, 750-803-1-1218

750 810. Propaedeutic Medicine. (2) II. Introduction to the principles of animal hospitalization, physical examination, diagnostic procedures and techniques, care of the hospitalized patient, and an introduction to the psychology of veterinary medical practice. Two hours lec. a week. Pr.: First year standing in College of Veterinary Medicine. 750-810-0-1218

750 812. 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. 750-812-4-1219

750 820. Theriogenology. (3) II. 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.: Second year standing in College of Veterinary Medicine. 750-820-0-1218

750 821. Companion Animal Medicine. (4) I. A study of the etiology, clinical signs, diagnosis, treatment and control of infectious or contagious disease conditions which affect horses, dogs and cats. Four hours lec. a week. Pr.: Third year standing in College of Veterinary Medicine. 750-820-0-1218

750 822. 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. 750-822-3-1219

750 823, 750 825. Clinical Medicine I. (6) **and II.** (6) I and II respectively. Study of the veterinary medical and surgical patient; participation in field studies of animal disease, veterinary public health, seminars, and clinicopathologic conference. Twenty-two hours lab. a week. Pr.: Fourth year standing in College of Veterinary Medicine. 750-823-1-1218, 750-825-1-1218

750 824. 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 College of Veterinary Medicine. 750-824-0-1218

750 826. Systemic Medicine I. (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. 750-826-3-1219

750 827. Systemic Medicine II. (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. 750-827-3-1219

750 830. Medicine I. (5) II. Consideration of medical and pathological aspects of diseases affecting the musculoskeletal, respiratory, cardiovascular, hemic and lymphatic, special senses, integumentary, and nervous systems. Five hours lec. a week. Pr.: Third year standing in College of Veterinary Medicine. 750-830-0-1218

750 837. Interpretation of Radiologic Studies of Body Systems. (4) 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. 750-837-0-1219

750 840. 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. Two hours lec. and two hours lab. a week. Pr.: Third year standing in College of Veterinary Medicine. 750-840-1-1218

750 842. 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 man are discussed. Pr.: D.V.M. degree. 750-842-3-1219

750 850. Medicine II. (4) I. Consideration of the medical and pathological aspects of diseases affecting the endocrine, urinary, and digestive systems. Four hours lec. a week. Pr.: Fourth year standing in College of Veterinary Medicine. 750-850-0-1218

750 882. Clinical Science Seminar. (1) I, II, S. A participating seminar for graduate students in the clinical sciences. Case studies will form the basis of the seminars. One-hour conference weekly. May re-enroll for total maximum of two credits. Pr.: Consent of department head. 750-882-0-1218

750 883. Veterinary Practice Management. (3) II. The business aspects of a veterinary medical practice, including consideration of factors involved in establishing and maintaining a professional practice, professional ethics, accounting, and investments. Pr.: Fourth year standing in College of Veterinary Medicine. 750-883-0-1218

750 886. Comparative Animal Nutrition. (5) I. A study of the veterinary medical aspects of nutrition including principles of feeding and nutrition of common domestic species of food producing and companion animals; consideration of material relative to therapeutic nutrition as related to clinical management of diseased and convalescent animals. Pr.: Third year standing in College of Veterinary Medicine or A.S.I. 700. 750-886-0-1218

750 887. Problem 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 his major professor outlines the methodology and procedures, conducts the study, and prepares a detailed report. Pr.: D.V.M. 750-887-3-1219

750 871. Medicine III. (4) II. Consideration of programs of disease prevention for domesticated animals. Four hours lec. a week. Pr.: Fourth year standing in College of Veterinary Medicine. 750-871-0-1218

750 892. Toxins in the Biological System. (2) I in odd numbered 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. 750-892-3-1219

750 895. Toxicology. (4) I. Effects of harmful substances on the animal body. Emphasis placed on toxicologic principles, and management of the poisoned patient. Four hours lec. a week. Pr.: Fourth year standing in College of Veterinary Medicine, Biochem. 520 and A. & P. 747 or equiv. 750-895-0-1218

750 897. 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 and/or controversy to mammalian health. Specific topics will change from semester to semester. Students in Ph.D. programs may repeat the course. Pr.: 211-521, 740-747. 750-897-3-1219

Veterinary Diagnostic Laboratory

H.D. Anthony, Director

Professors Anthony* and West;* Associate Professors Gray,* Milleret,* and Philips; Instructors Baugh and Howard.

The Diagnostic Laboratory serves the livestock industry in the state in solving animal disease problems. The laboratory not only is a service unit for animal diseases but also is a responsible service unit for human health problems relative to animal disease. The laboratory is the official rabies diagnostic service to the state.

Special laboratories with appropriate personnel and equipment can perform a variety of diagnostic tests not available or accessible to practitioners in the state.

The Diagnostic Laboratory is nationally recognized as a fully accredited laboratory with capabilities in all areas of diagnostic service.

The staff of the laboratory also contributes to the teaching, service and research programs of the college.





The Land Grant Tradition

Agriculture at Kansas State University

Roger L. Mitchell, Vice President for Agriculture

Historically the foundation of K-State's educational program has been service to the citizens of a state which was basically agricultural. In modern times with the threat of starvation enveloping the globe, K-State's particular specialty is even more relevant.

Agriculture at Kansas State University includes instruction, research, extension, and international agriculture. County agents, branch experimental stations, and experimental fields throughout the state are part of agriculture. Under the vice president for agriculture are four administrators: the dean of the College of Agriculture, the director of the Kansas Agricultural Experiment Station, the director of the Cooperative Extension Service and the director of International Agriculture Programs.

International Agricultural Programs

Vernon C. Larson, Director

People from other countries and people in other countries have helped Kansas State University forge a proud achievement record in international activities. Most of these activities have focused on helping the developing countries establish land-grant type institutions geared to increasing food production and improving the country's economy.

The KSU community and the state of Kansas are conducive to international cooperation, and the KSU staff and faculty have found cooperative environments abroad that, for the most part, have resulted in excellent development programs.

K-State has been involved in international activities since 1956 when its College of Agriculture was 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). Deep involvement by the University since that time has produced a pool of faculty and international officers with long experience in managing international programs in harmony with the U.S. land-grant tradition—the U.S. educational movement that made education available to all people rather than only to those in upper strata.

During the work with India (1956-1972), 59 faculty members served in India, 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 K-State.

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. It is a continuing relationship with Nigeria. The University has written agreements with six of the northern Nigerian states to train government officers at both the undergraduate and graduate level.

Since 1976 the University has worked with the Philippine government and in August, 1977 signed a 5-year agreement to assist in the Integrated Agricultural Production and Marketing Program. This is a 32 million dollar program funded by U.S. and Philippine monies that involves technical assistance, graduate student training and physical plant development.

The Food and Feed Grain Institute highlights K-State's unique competence in the post-harvest technology of food and feed grains. It has provided international technical assistance and research to over fifty countries since its inception in 1966.

K-State also is linked with the land-grant institutions of Iowa, Missouri and Nebraska to form the Midamerica International Agricultural Consortium. This arrangement enables the University to respond quickly to international agency requests for assistance to developing countries in solving their food problems.

Additional programs, all focusing on the world food situation and stressing that the U.S. role is to help the developing world help themselves, include activities in Paraguay, Sierra Leone, Libya, Morocco, India, Taiwan, Afghanistan, Tunisia, and Mexico.

Division of Continuing Education

E. Norman Harold, Director
J. Lance Kramer, Associate Director
Douglas King, Business Manager
Betty A. Ayres, Assistant Director
Robert W. Stamey, Assistant Director

Associate Professors Brock, Cashin, and Kramer; Assistant Professors Harold, Hazlett, Lockhart, Lojka, Miller, Steffen, Callance, and Williamson; Instructors Ayres, Biles, Collins, Crees, Dieckhoff, Draves, W. Dunn, Flaherty, Heinsohn, Hosey, Irelan, Killacky, King, Kruh, Maes, Martin, Mathewson, Reidlinger, Rippetow, Slawson, and Stamey.

The function of the Division of Continuing Education is to make the resources of Kansas State University available to the people of Kansas. The division offers a variety of educational services on almost every level of interest or desire. Each year from 8,000 to 9,000 persons participate in credit courses, and from 15,000 to 20,000 participate in non-credit educational activities.

Credit Classes Off-Campus

The Division of Continuing Education strives to determine the educational needs of the people throughout the state and respond to those needs with credit programs from the various colleges and academic units.

An ever-expanding program of courses is offered at a growing number of locations in Kansas. Kansans in Dodge City, Salina, Topeka, Kansas City and other locations can work toward an advanced degree from Kansas State University by attending classes taught by University faculty in their home community. Programs of sequenced courses can take the student toward degrees in such academic areas as education, history, computer science, and industrial engineering.

In addition to sequenced courses leading toward a graduate or undergraduate degree, 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 various 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 of these groups.

Regents Continuing Education Network

Many courses and other educational programs normally offered on the K-State campus are available to the people of Kansas by means of the Regents Continuing Education Network. The network is a system of 28 educational centers located throughout Kansas and linked together via telephone lines. The locations include Chanute, Colby, Concordia, Dodge City, El Dorado, Emporia, Garden City, Goodland, Great Bend, Hays, Hutchinson, Independence, Kansas City-Wyandotte County, Lawrence, Liberal, Manhattan, Marysville, Norton, Paola, Pittsburg, Pratt, Sabetha, Shawnee Mission-Linwood Center, Salina, Stockton, Topeka, Wellington,and Wichita.

Each center is equipped with amplifying telephone equipment allowing easy "two-way" communication between all 28 locations. In addition to the amplified telephone system, each of the 28 centers is equipped with general types of audio-visual support equipment. A monitor is present at each location to operate the equipment, distribute handout materials, and provide general educational support.

Each year several thousand people participate in credit and non-credit courses on the network. Instruction usually originates from KSU or one of the other Regents' universities. However, the flexibility of the system allows resource people from throughout America to be hooked electronically into the system. Thus, people across the state can have access to national educational resources.

Meetings and conferences also are held on the network. The telephone hookup allows nationally recognized people to participate in local activities at a minimum cost and maximum effectiveness.

Non-Traditional Study

The Non-Traditional Study Program (NTS) is designed for undergraduate students who need a personalized approach to study. NTS is oriented toward those students who have encountered obstacles to traditional college attendance, helping them surmount barriers created by distance, by physical handicap, or by job.

NTS advisers assist students in planning individual programs of study and serve as guides to faculty and media resources. The advisers help students select options such as late afternoon, evening, or off-campus classes, correspondence study, credit by examination, or work-study programs.

In addition to class requirements, the advisers direct students toward the completion of independent study projects, and toward the development of documentation of prior non-sponsored learning. Given appropriate documentation, credits may be granted for learning achieved without formal, sponsored instruction.

The Bachelor of General Studies is available through NTS. This "competency-based" degree is meant to serve students whose educational aims cannot be satisfied by a conventional major, and/or whose main area of study intersects two or more colleges within the University.

Intersession

Kansas State University conducts its Intersession Program during major breaks in the standard academic calendar. There are two Intersessions offered each year; one in early January, the other in late May and early June. During this time, 80-100 courses are offered; including regularly listed courses and new, innovative courses. These courses

generally run for two weeks and are attended by current KSU students, as well as by persons 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 explore areas of study which otherwise would not be possible during regular school terms. For example, an extended two- or three-week trip to another part of the state or country is possible during this time. Students also have the opportunity to explore both new interests and topics in their major field 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 curriculum. The KSU faculty uses Intersession as an opportunity to experiment with new ideas and formats for teaching. Many courses are offered on an experimental basis to test the possibility of becoming regular offerings by a department.

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 adviser to determine if a particular Intersession course will meet necessary degree requirements.

Center for Faculty Evaluation and Development in Higher Education

The Center for Faculty Evaluation and Development in Higher Education aids the efforts of faculty members at colleges and universities throughout the United States and Europe as they pursue their teaching activities and other professional responsibilities.

The center is partially supported by the W.K. Kellogg Foundation and works with approximately 100 colleges and universities, providing faculty and administrative evaluation and development services. These services include the use of the IDEA System (Instructional Development and Effectiveness Assessment) which has been developed on the Kansas State University campus over the course of the past eight years. The center also provides the services of a team of educational development specialists and consultants to institutions using the IDEA system. The center staff, with the assistance of outside consultants, conducts semi-annual training workshops for those individuals who coordinate the use of the IDEA system on their campuses and also conducts an annual series of faculty-administrative development seminars at major cities throughout the United States.

Conference Center

The KSU Conference Center 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 non-credit programs. All programs which are sponsored on the KSU campus in which fees are collected from the participants and/or university facilities are utilized are coordinated through this office, which is empowered to collect all fees and pay all bills associated with such activities.

Services available through the Conference Center include program development and design, program budgeting, brochure design and printing, publicity, facility, food and accommodation arrangements, speaker and resource arrangements, preparation of materials, registration, and follow-up activities.

The involvement of the Conference Center in a conference, workshop, short course or similar activity will be either: (1) a full service involvement in which the Division of Continuing Education is responsible for the total activity; (2) a partial service involvement in which the division shares specific responsibilities for the activity with the client group; or (3) a minimal service involvement in which the division staff conducts registration, collects fees, and pays the expenses. In all three cases, the specific responsibilities and budgets are negotiated with the client group prior to the scheduling of the activity.

For detailed information and assistance, contact the KSU Conference Center, Wareham Building, KSU (913)532-5575.

Fort Riley Course Offerings

Kansas State University offers a series of courses at nearby Fort Riley, Kansas. KSU works in cooperation with the Army Education Center (Old Trooper University) to provide persons in the Fort Riley community the opportunity to take University courses. Courses are scheduled to be convenient for army personnel who are required to maintain a full-time job while attending Kansas State University. The courses are taught by regular KSU faculty members, and fulfill degree requirements where applicable. Courses are scheduled to allow the completion 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. Courses are offered during the daytime, as well as during the evening hours to accommodate persons unable to attend on-campus classes because of work requirements or other scheduling conflicts. KSU courses offered at Fort Riley are open to military, as well as non-military students.

Kansas State University maintains an office at Fort Riley staffed by KSU personnel familiar with degree requirements and KSU requirements on acceptance of transfer work. Students are encouraged to meet with these advisers to pursue their academic goals and objectives.

Kansas Rural-Urban Art Program

KRUAP is a program centered around the appreciation for and the involvement in art. It offers credit and non-credit courses and sponsors regional art shows and critiques and a state-wide amateur art exhibition.

Servicemen's Opportunity College

The Servicemen's Opportunity College (SOC) is affiliated with Kansas State University. The program maintains a commitment to servicemen and women interested in pursuing a college education. Through the Division of Continuing Education, KSU offers courses at Fort Riley and Fort Leavenworth. These courses are scheduled to avoid conflicts with military duties and to provide the opportunity for an education.

University For Man

University for Man is a community education organization which develops and conducts a wide variety of informal educational opportunities which do not involve prerequisites, grades, credits, or tuition. Offering classes, symposia, forums, and unstructured learning experiences covering a wide range of human interests, activities, and concerns, University for Man is committed to the development and expansion of informal learning opportunities available to the people of Kansas.

Kansas Agricultural Experiment Station

Floyd W. Smith, Director
Stanley E. Leland, Jr., Associate Director
Lowell Brandner, Editor
Grace Mullenberg, Associate Editor
Warren C. Pray, Instructor

The Kansas Agricultural Experiment Station is supported by both federal and state funds. Acts of Congress authorizing grants (always subject to state legislative assent) have included the Hatch Act of 1887, the Adams Act of 1906, Purnell Act of 1925, Bankhead-Jones Act of 1935, an amendment to the Bankhead-Jones Act, Agricultural Marketing Act of 1946, the 1955 act to consolidate previous acts pertaining to state agricultural experiment stations, the McIntire-Stennis Act of 1962, and the Rural Development Act of 1972.

Each session of the Kansas legislature and each session of the 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 unique responsibility of the Agricultural Experiment Station is to conduct original research in the broad field of agriculture and to publish and disseminate the results of agricultural research. Attention is devoted largely to the solution of problems related to agriculture, including farm homes.

Departments of the Agricultural Experiment Station are as follows: Agricultural Engineering, Agricultural Economics, Agronomy, Animal Science and Industry, Biochemistry, Biology, Business Administration, Chemical Engineering, Chemistry, Computer Science, Economics, Entomology, Dairy and Poultry Science, Grain Science and Industry, Geology, Home Economics, Horticulture and Forestry, International Agriculture, Nuclear Engineering, Physics, Plant Pathology, Political Science, Statistics, Sociology and Anthropology and Veterinary Medicine, and the five branch stations—Colby, Fort Hays, Garden City, Southeast Kansas and Tribune.

Research of the various departments includes agricultural economics, soil and water investigations, plant science, animal and animal feeds investigations, plant diseases and insects, animal diseases and pests, agricultural engineering, food science, human nutrition, home economics, social science, and other fundamental and applied studies.

An annual budget of about $15.1 million and many positions for graduate research assistants make the Kansas Agricultural Experiment Station a strong ally of the Graduate School. The Experiment Station has research projects in six colleges of the University. Interested graduate students are encouraged to seek graduate research assistantships to supplement their graduate study programs.

Research by scientists in the experiment station is organized into more than 600 projects which cover nearly all phases of agriculture in its broadest context. More than 11,000 acres is involved in agricultural research. Among the projects are physiology and nutrition of plants and animals; diseases of plants and animals; chemical composition of soils, plants and animal products; plant and animal breeding; crop rotations and fertilizers; acclimatization of new plants and trees; grasses and forage plants; feeds for livestock; production, processing, marketing, distribution, and use of agricultural products and machinery and equipment; farm management and other economic problems; sociological problems; community development; human nutrition and family living.

Farms, branch stations, well-equipped laboratories and scientific equipment are available for use by Experiment Station researchers.

Results of research are published in scientific journals, station bulletins, circulars, pamphlets, leaflets, reports of progress, research papers, popular journals, news releases to the press and to radio and television stations and reports at field days and other special events. All bulletins and other publications of the Agricultural Experiment Station are sent without charge to citizens of the state. Any person in the state may be placed on the permanent mailing list of the station to receive announcements of station publications.

Letters of inquiry and general correspondence should be addressed to the Kansas Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.

Branch Agricultural Experiment Stations

Fort Hays Branch Station

W.M. Phillips, Acting Head and Professor

Professors Brethour, Hackerott, Harvey, Launchbaugh, and Livers; Associate Professor Stegmeier; Assistant Professors Baxter, Martin, Stahlman, and Thompson.

Land occupied by this station is 3,700 acres of the former Fort Hays military reservation. A bill was approved by Congress March 28, 1900, setting aside this reservation for experimental and educational purposes. It was accepted by the state legislature February 7, 1901. The same session of the legislature passed an act providing for the organization of a branch experiment station and appropriating funds for preliminary work.

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, legumes, and grasses; soil management; weed control; and insects as related to crops and livestock.

Garden City Branch Station

G.L. Greene, Head and Professor

Associate Professors Cress, Davis, and Herron; Assistant Professors Condray, DePew, Norwood, Penas, Wernecke, and Witt; Instructor Ohmes.

A 99-year lease from the Finney County commissioners to the State Board of Regents beginning June 14, 1907, provided 320 acres for agricultural research. Additional adjoining tracts totaling 235 acres were purchased in 1937 and 1939. An 80-acre irrigated tract was made available by The Garden City Company in 1948.

Current investigations involve extensive irrigation research, livestock feeding, dairying, dryland soil management, crop improvement, weed control, horticultural and specialty crops, insect control, and soils and fertilizer relationships. One of the two state soils laboratories is located at the Garden City Branch Station.

Colby Branch Station

E.E. Banbury, Head and Professor

Associate Professor Lawless; Assistant Professors Petersen, Schwulst, and Sunderman; Instructor Treat.

The Kansas legislature of 1913 provided for a branch experiment station near Colby. It is on a tract of 715 acres. The original tract of land was purchased by Thomas County and deeded to the state. In 1941 the state purchased an additional 320 acres. In 1963 additional land was acquired through an exchange of 39 acres of the original tract for an adjoining quarter section. Operations at the Colby station were begun in March, 1914. Investigations include crop improvement, soil and crop management, irrigation, sheep production and adaptation studies with fruit and shade trees, shrubs and flowers.

Tribune Branch Station

R.E. Gwin, Jr., Head and Assistant Professor

Assistant Professor Gallagher.

The Tribune Branch Station was established in 1911 by an act of the Kansas legislature.

At the Tribune station experimental work is conducted for the benefit of the surrounding western territory. Special attention is paid to the problems of producing field and specialty crops under conditions of limited rainfall and under irrigation.

Southeast Kansas Branch Station

R.J. Johnson, Head and Professor

Instructors Fransen, Ibbetson and Kelley.

After World War II, a 242-acre tract of land near Mound Valley, used as an auxiliary landing field, was declared surplus property. Ownership was transferred to Kansas State University in 1948. In 1949 the Kansas legislature authorized the establishment of the Mound Valley Branch Experiment Station and appropriated funds for its development and operations.

The 1966 Kansas legislature transferred 485 acres of land formerly operated by the Parsons State Hospital and Training Center to Kansas State University and authorized consolidation of the Mound Valley, Parsons, and Columbus Experiment Field land into a single unit, the Southeast Kansas Branch Experiment Station, with headquarters at Mound Valley.

Soil studies in relation to yield and quality of crops, field crop investigations, dairy cattle production, 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 12 experimental fields of from 20 to more than 320 acres each. Six are operated by the Department of Agronomy. They are on different soil types and under different climatic conditions. Field crops and soil investigations are specially pertinent to local conditions. Three fields are supervised jointly by the Departments of Agricultural Engineering and Agronomy and include irrigation studies. Fields (most leased) are: Cornbelt (Powhattan), North Central Kansas (Belleville), Irrigation (Scandia), Southwest Kansas (Minneola), Sandyland Irrigation and Dryland (St. John), South Central Kansas (Hutchinson), Newton, East Central (Ottawa), Kansas River Valley Irrigation (Topeka: Rossville and Silver Lake).

Three fields for horticultural and forest crops operated by the Department of Horticulture and Forestry are Northeast Kansas (Wathena), Wichita and Southeast Kansas (Chetopa).

The Kansas Water Resources Research Institute

William L. Powers, Director

Cooperating with the Water Resources Institute, University of Kansas

The Kansas Water Resources Research Institute was established by the Board of Regents October 31, 1964, at Kansas State University after Congress passed the Water Resources Research Act of 1964. By Regents' stipulation, Kansas State University and

the University of Kansas participate in the institute so maximum benefit will accrue to the citizens of Kansas. Consequently, the institute can support water resources research in any department at either university. The policy committee governing the institute is composed of representatives from both Kansas State University and the University of Kansas.

The purpose of the institute is to conduct basic and applied research and to train scientists in areas related to water resources. Research and educational interests include the hydrologic cycle; supply and demand for water; conservation and best use of available supplies of water; methods of increasing such supplies; and economic, legal, social, engineering, recreational, biological, geographical, ecological and other aspects of water problems.

Evapotranspiration Laboratory

Hyde S. Jacobs, Director

Established by the 1968 Kansas legislature, this laboratory is concerned with conserving Kansas' limited water resources by reducing both evaporation from soil and plant surfaces and transpiration from plant leaves.

The Food And Feed Grain Institute

C.W. Deyoe, Director

Leonard W. Schruben, Associate Director

The institute is based on the faculty in the Grain Science and Industry Department and utilizes some faculty in other departments. Its goals are to develop methods of milling and processing grains; to evaluate and improve their quality and nutritional properties; to find new uses for them; and to improve the handling, transporting, storing, and domestic and international marketing of grains and foods.

The Statistical Laboratory

A.D. Dayton, Director

This laboratory was established in 1946 to provide consulting and computational services to the faculty and students of Kansas State University, especially those associated with the Kansas Agricultural Experiment Station. It is under the administration of the Department of Statistics whose faculty is available by appointment for statistical and computational assistance on a twelve-months basis to assist in the designing of experiments.

Division of Cooperative Extension

John O. Dunbar, Director
Fred D. Sobering, Associate Director

The basic mission of Extension is to deliver informal, out-of-school, non-credit 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. Thus, Extension is people, problem, and progress oriented.

Extension provides an important learning bridge between the University and the people of the state. It takes scientific knowledge, principles, and practices to all corners of the state that bear directly on the grass roots problems of people. 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 four major program areas—agriculture, home economics, 4-H youth and community resource development.

Changing conditions continually enlarge and modify the emphasis on subjects relating to the major program areas. An increasing number of departments within the nine colleges of the University contribute knowledge to support the expanding programs of Cooperative Extension.

The audience for Extension efforts now includes urban and suburban people, as well as the farm families for whom the original programs were designed. Extension specialists now 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

To achieve the basic goal of taking 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 advisers, 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 persons with the work of the University by organizing and conducting groups to visit the University and its branch experiment stations and fields. Many statewide organizations in agriculture, home economics and 4-H club work are given assistance with their annual conferences at the University. Included in this type of educational work are the various breed, seed and feed associations; the Kansas Home Economics Advisory Council; and the 4-H Round-up.

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 kinds of 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 are also specialists training individuals who in turn train others, either individually or in groups. Thus, these public-spirited lay leaders 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 the county Extension agents by helping individuals consider problem solving alternatives. They also apprise the county Extension agents of new developments in research.

The basic role of the Extension specialist is to interpret research developed by the state agricultural experiment station and USDA, help county agents to 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 Local People to State and National 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.

Department of Extension Information

Gary L. Vacin, Extension Editor and Head of Department

Professor Unruh; Associate Professors Vacin and Graham; Assistant Professors Daly, Medlin, Peck, and Sullins; Instructors Dierking, Harmes, McGlashon, and Ward; Emeritus: Professors Warner and Thomas; Associate Professors Dexter and Shankland; Assistant Professor Tennant.

This department provides communications support for the Cooperative Extension Service, with major emphasis on the print 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 through the mass communications media. This includes the responsibility of reporting to all people of Kansas new developments and recommendations in agriculture, quality of living, 4-H and youth work, public affairs, and community and rural development. All means of communication are utilized in disseminating information for the benefit of all Kansas residents.

Scientific information, as written or produced in popular version by the departmental staff, is channeled through all appropriate means of communications, including newspapers, magazines, publications, circulars and posters, printed annual reports, exhibits, slides, radio and television.

The state's weekly and daily newspapers and various state, regional, and national magazines are provided news stories and photographs about the activities of the Kansas Cooperative Extension Service and research work of the Kansas Agricultural Experiment Station.

County Extension agents are provided a weekly press service and are given special training throughout the year in utilizing to the maximum a balanced information program. The department cooperates with agents in all 105 counties and specialists in the five area Extension offices, and the state office in planning and executing information programs.

A second major objective is to support all Extension departments by providing general editing and printing needs related to publications, educational literature, reports, records, forms, and office supplies.

Areas of emphasis include:

—Providing the editorial support for developing and printing Extension publications designed to support on-going educational programs.

—Offering editorial assistance to all specialists in preparing their training literature, reports, proposals, and other written communications.

—Operating a duplicating center to provide the rapid reproduction services needed to meet small quantity and short notice demands for program support.

—Maintaining a distribution center as an efficient means of circulating Extension and Experiment

Station publications, handling office supplies for state and area specialists, and consolidating mail services.

A third major objective is to operate an instructional media center that makes a variety of audio visual equipment and related services available to Extension personnel. A library of motion pictures and slide sets for visual instruction is maintained for use by county agents, and area and state Extension specialists. Planning, designing, and preparing audio-visual materials and artwork for specialists working on priority Extension programs is an important phase of work in the department.

Department of Extension Radio-Television-Film

Jack M. Burke, Associate State Leader and Manager, Radio Station KSAC

Professors Burke and Titus; Assistant Professors DeWeese, Kuehn, Naegel, Nelson, and Stockard; Instructors Baker, Ballou, Blevins, and Nagel.

This department provides mass communications support to all areas of the Cooperative Extension Service. In the radio area it administers and programs KSAC, an institution owned public radio station which is on the air from 12:30 p.m.-5:30 p.m., Monday through Friday on 580 Hz. Station KSAC is used exclusively for the dissemination of information and cultural programming.

The K-State Radio Network is both a live and audio tape service to Kansas commercial radio stations with over 30,000 tapes distributed each year. Subjects include agriculture, ecology, home economics, public affairs and sports.

Script services on agriculture and home economics are sent to commercial radio stations, county agents, newspapers and farm magazines. County agents are given assistance in planning local radio and television programs.

Numerous live or taped programs are arranged for Extension Service and other University staff members for use on local Kansas stations.

Daily television programs showing results of research and demonstrations are planned and presented on cooperating television stations through the Wichita office of the department. Special television training is provided for Extension and other University staff members who appear on television.

Motion pictures for the University and off campus groups with educational objectives are produced on a fee basis.

Extension Agricultural Programs

Wilber E. Ringler, Assistant Director, Professor

Specialists in several departments of the colleges of Agriculture, Engineering, and Veterinary Medicine, offer direct educational and technical assistance to Kansas citizens throughout the state.

Departments have Extension faculty who plan, conduct and evaluate off-campus programs in their respective subject matter areas. These specialists organize the educational information, prepare support materials, and make presentations in counties, upon request from county agents.

In addition, Extension offers interdisciplinary programs in three areas:

Food, Feed and Forage Production. Stresses continued application of physical, biological, and economical factors to food, feed, and forage production which influence sound crop production practices, good business management, efficient use of labor, and rapid adoption of new technology.

Animal Production and Utilization. Provides a more concentrated effort for effective production and utilization of meat, dairy, and poultry products, based on such economic factors as comparative advantage in animal and feed resources, climate, producer competence, market location, and consumer demand.

Resource Use and Conservation. Focuses attention on increasing need for pollution-free soil, water, and air in rural and urban settings; zoning; and public affairs education. Also, emphasizes proper management and conservation of fields and forests—as related to commercial production and recreation—to gain clientele and legislative approval and support.

Management on Commercial Farms. Helps producers effectively manage their farm, forest, or range enterprises to increase the proper utilization of the marketing system. Farmers need continued information about enterprise organization, total business structure, and procurement of supplies, labor, credit, and equipment.

Extension Agronomy

Hyde S. Jacobs, Head of Department

Verlin H. Peterson, State Leader

Professors Bohannon, Edelblute, Ellis, Jacobs, Nilson, Peterson, Whitney, and Wilkins; Associate Professors Dicken, Follett, Kilgore, Nuttelman, and Reinhardt; Assistant Professor Ohlenbusch; Emeritus: Professors Bleberly, Cleavinger, Jones, and Lind; Associate Professor Harper.

The Extension Agronomy department conducts a state-wide educational program in agricultural crop production and 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, promote the adoption of proven practices, and inform the Agricultural Experiment Station of needed research. The agronomy specialists correlate their program with specialists in all other subject matter areas to insure the most effective overall Extension program.

Extension Animal Sciences and Industry

Don L. Good, Head of Department

Wendell A. Moyer, Section Leader

Professors Good, Francis, Moyer, and Zoellner; Associate Professors Bonewitz, Corah, Dunham, and Jackson; Assistant Professors Brazle, Orwig, Schafer, Schwartz, and Spaeth; Extension Assistant Olsen; Emeritus: Professor McAdams.

Extension specialists in Animal Sciences and Industry provide leadership for state programs in beef cattle, dairy cattle, poultry, sheep, swine, meats and dairy products. 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.

Extension Entomology

Richard J. Sauer, Head of Department

Professors Gates, Sauer, and Brooks; Associate Professor Mock; Assistant Professor Thompson.

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. The 4-H entomology project is designed to teach the interrelation of insects and the environment, as well as the identification of insects.

Extension Horticulture

Ronald W. Campbell, Head of Department

Frank D. Morrison, Section Leader

Professor Morrison; Associate Professor Marr; Assistant Professors Leuthold, van der Hoeven, and Wootton.

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 or personal use, the use of horticultural plants for therapeutic purposes, or for environmental improvement or family gardens.

Assistance is available to suburban, urban and rural homeowners; and to commercial producers, such as florists, nurseries, greenhouse operators, 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. Special programs for handicapped persons in mental treatment centers, health care facilities and other institutions are designed to emphasize the therapeutic value 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 conducted in a variety of ways, including training schools, workshops, demonstrations, publications, slides and scripts, news releases, radio and television programs and personal contact.

State and Extension Forestry

Harold G. Gallaher, State and Extension Forester and Head, Department of Forestry

Professors Gallaher and Strickler; Associate Professors Biswell, Gray, and Nighswonger; Assistant Professors Aslin, Atchison, Baughman, Bratton, Boutz, Gaylor, Geisler, Gould, Lindsey, Loucks, Lynch, Moyer, Naughton, Pinkerton, and Rowland.

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 is operated, providing 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 efficiency and better utilization of the timber crop.

The department also operates a Cooperative Rural Fire Control program. Assistance is given to rural fire districts in organizing, planning, fire prevention, obtaining fire equipment, 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 use areas around reservoirs. The section also 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 northwest of the main campus. The Forestry Building, at 2610 Claflin Road in Manhattan, also houses the tree distribution, tree cold storage, greenhouse, and shop facilities. Paneling of twelve Kansas hardwood species is on display in the building. Area forestry offices are in Chanute, Garden City, Hays, Hutchinson, and Manhattan.

Extension Plant Pathology

James F. Shepard, Head of Department

Professors Shepard and Willis; Associate Professor Claflin; Assistant Professor Nesmith; Instructor Pinnow; Emeritus: Professor King.

The purpose of the work by Extension specialists in plant pathology is to keep the people of Kansas informed about the occurrence and nature of plant diseases and economic means for their control. This includes diseases of field crops, vegetables, fruits, trees, flowers, lawngrasses 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

Extension Veterinary Medicine

Homer K. Caley, State Leader

Professors Caley; Assistant Professor Breeden; Emeritus: Associate Professor Osburn.

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. Current research is evaluated and adapted for use in these areas.

Research projects, field trials and surveys are implemented into the work program so that our livestock interests can be provided with actual test results as conditions exist on Kansas farms and ranches.

Extension Wildlife Damage Control

Assistant Professors Boggess and Henderson

The function of this section 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 attitudes which recognize 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 surveys. 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, 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 Agricultural Engineering

William H. Johnson, Head of Department

Leo T. Wendling, State Leader

Professors Holmes, Johnson and Wendling; Associate Professors Jepsen and Schindler; Assistant Professors Hay, Murphy, Powell, Rogers, and Thomas; Extension Assistant Schrock. Emeritus: Professors Ferguson and Stover; Associate Professor Selby.

The function of the Department 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 in subject matter fields such as the control of soil erosion; the development, conservation and utilization 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 subject matter areas. The department also 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 Agricultural Economics

Paul L. Kelley, Head of Department, Professor

Farm Management

Professors Langemeier and Schlender; Associate Professors Bogle, Figurski, and McReynolds; Assistant Professors Baden, Overley, and Pretzer; Instructors Allen, Appleby, Bratcher, Childs, Collins, Dawson, Dickson, Everson, Faidley, Gerloff, Germann, Greene, Hackler, Harrold, Herod, Janssen, Lobmeyer, Mullen, Nelson, Parker, Reimer, Smith, Strickler, and Urban; Emeritus: Professors Coolidge and Thomas; Instructors Bartlett, Hageman, McClelland, Means, and Frederick.

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 24 area extension economists, farm management (fieldmen), conduct an intensive educational program with 3,800 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 120-150 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 record, 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 subject matter areas.

The Area Farm Management Program encompasses the public educational program in farm management. This is conducted by state specialists and area extension 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 agri-business 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 agents. 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 agri-related businesses and persons, such as bankers, Production Credit Association managers, machinery dealers, and feed and supply firms.

Public Affairs and Economic Information

The public affairs Extension educational program is designed to provide the people of Kansas and their leaders with educational information on public issues which are of current interest. The purpose is to provide the people with the facts so they have broader and more accurate knowledge from which to make a decision. 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. The purpose of the program is to disseminate economic information to individuals which helps them make day-to-day decisions or which can be used for immediate or long-term business planning.

Extension Marketing

Professor Whitehair; Associate Professors Frederick and Walker; Assistant Professor Barton.

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 method is used to solve problems in the marketing field.

The main projects of marketing include marketing information, agri-business, and commodity marketing activities. Marketing news releases, publications directed to the general public and special information directed toward specific agricultural audiences are methods used in disseminating 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. Those firms are included which buy directly from the farmer; sell input products and retail products and services. 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 Grain Science and Industry

C.W. Deyoe, Head of Department
Robert W. Schoeff, Section Leader

Professors Schoeff and Wilcox; Associate Professor Balding.

Kansas State University has the only Formula Feed Extension program in the United States designed for the feed manufacturing industry. This unique 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; 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, building 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 the areas of grain quality, grades and inspection, and transportation and (2) processing and utilization through milling and baking.

Extension Community Resource Development

Oscar W. Norby, Assistant Director of Extension

Professor Norby; Associate Professors Frazier, Halazon, and Utermoehlen; Assistant Professors Albright, Baker, Bittel, Deutsch, Eberle, Hendrix, Mosier, and Sisk.

Community Resource Development is a process whereby those in a community arrive at group decisions and take actions to enhance the social and economic well-being of the community.

Community Resource Development educational programs include subject matter in such areas as comprehensive planning, land use, community organization, leadership development, recreation, tourism, economic development, community housing, community health and welfare, community facilities and services, local government, public affairs, taxation, manpower development, and environmental improvement. The Community Resource Development staff develops and implements programs in coordination with five Area Extension Specialists, Community Resource Development; County Extension Agents; local leaders and citizens; and civic and governmental agencies and organizations in helping to strengthen communities, promote employment, and improve agriculture—all of which results in communities that are better places in which to live and work.

Quality of Living Programs

Department of Extension Home Economics

Gail L. Imig, Assistant Director of Extension, Quality of Living Programs

Professors Anderson and Redeker; Associate Professors Atkinson, Carlson, Clonts, Imig, Slinkman, and Tucker; Assistant Professors Clarke, Howe, Jones, Meyer, Spalding, and Whitney; Instructor Stryker; Emeritus: Professors Allen, Ellithorpe, and Koenig; Associate Professors Dickinson, Johnson, and Wiggins; Assistant Professors Briggs, Guthrie, Miller, and Starkey.

Educational programs designed to improve the quality of living are carried on in each Kansas county under the direction of Quality of Living programs.

Program emphases are in the areas of: development of children and youth; marital and parental roles; preparation for retirement years; changing roles of women; management in allocation of family resources; family financial security; money management; consumer performance in the market; nutrition and health; food safety and sanitation; health and safety; hazards in the home and community; community health hazards; home selection, building, buying, and remodeling; housing costs and finance; community factors in housing decisions; furnishing and equipping the home; and developing community economic, social, cultural, human resources including understanding public concerns affecting families, expansion and improvement of cultural opportunities and development of leadership abilities.

Each county designs its Quality of Living 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 through the mass media of press, radio and television.

Quality of Living programs often work jointly with other Extension departments, and other agencies and organizations in carrying out educational programs.

Extension Expanded Food And Nutrition Education Program

Gail L. Imig, Assistant Director of Extension, Quality of Living Programs

Associate Professor Wells.

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 economists. The program is being conducted in designated counties.

4-H And Other Youth Programs

Glenn M. Busset, Assistant Director of Extension, 4-H and Youth

Professors Apel and Busset; Associate Professors Bates, Borst, Jackson, Hanna, and Lang; Assistant Professors Abell, Adams, Fisher, Robbins, Rohs, and Weaver.

4-H work is the out-of-school youth educational program of the University, conducted in cooperation with County Extension Councils and the United States Department of Agriculture. In 4-H work young people take part in agricultural, homemaking, community service, health, music, education, safety, conservation, recreation, and other activities. 4-H work is often explained by the slogan "Learning by Doing." Through projects, scientific information recommended by the University is applied to problems of agricultural production, home living and personal development.

Each local 4-H Club elects its own officers who conduct club meetings with guidance of volunteer adult leaders. The club meets at least once monthly in a member's home or in a public building. The meetings have educational features, such as demonstrations, talks and discussions. Adult leaders counsel with the 4-H members and give guidance to their club activities. Each member carries to completion at least one personal project. Any boy or girl 7 to 19 years of age may be a 4-H member. The leaders and members work in cooperation with the county Extension agents.

In addition to approximately 30,000 boys and girls enrolled in 1,050 4-H Clubs, another 46,000 boys and girls have had one or more 4-H educational experience as special 4-H members. The 4-H program nationally has more than 30 million alumni, and has been adopted or adapted into nearly 100 foreign countries.

4-H work began as the University sought to expand research developments to the farmers of Kansas. Children were organized into informal educational groups shortly after 1903. Corn, canning, pig and poultry clubs were among the first educational groups that had affiliation with the University.

It soon became evident that the educational development of boys and girls was of greater importance than the spread of improved farm and home practices. The 4-H program was broadened to include not only projects of a farm and home nature, but many other activities such as health, music, conservation of wildlife and natural resources, recreation, parliamentary practices and art.

The present 4-H program is designed to develop citizenship and leadership among all young people and to provide opportunities for them to participate with their parents and friends in the adoption of better farm, home and personal practices.

A later development, extending 4-H work around the world, is the International 4-H Youth Exchange (IFYE). Kansas 4-H members have lived for periods of up to one year with farm families in foreign countries around the world. Youths from foreign countries have lived in Kansas host family homes. Kansas has sent and received more "IFYE's" than any other state, giving national leadership to the program for international understanding. A cultural exchange on a large basis began in 1977 with nearly 200 Japanese young people living in Kansas homes for three weeks. The exchange becomes bilateral in 1978.

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. The area Extension specialists work directly with the county Extension agents and local leaders in conducting educational programs specifically fitted to the particular area.

Southwest Area Extension Office, Garden City

Ray H. Mann, Area Extension Director

Professors Edelblute, Francis, and Mann; Associate Professor Neufeld; Assistant Professors Aslin, Baden, Boggess, Hendrix, Mock, Rohs, and Thomas;* Instructors Germann, Herod, Janssen, and Lobmeyer.

Northwest Area Extension Office, Colby

Philip B. Finley, Area Extension Director

Assistant Professors Adkins, Atchinson, Finley, Overley, Rogers, Schroeder, Schwartz, and Sisk; Instructors Faidley, Reimer, and Urban.

South Central Area Extension Office, Hutchinson

Lawrence J. Cox, Area Extension Director

Professor Cox; Associate Professors McReynolds and Nuttelman; Assistant Professors Albright, Lindsey, Orwig, Weaver, Whitney, and Wiggins; Instructors Allen, Bratcher, Collins, and Whitson.

Northeast Area Extension Office, Manhattan

Richard F. King Jr., Area Extension Director

Associate Professors Borst, Dicken, Figurski, King, and Utermoehlen; Assistant Professors Biles, Crist, Geisler, and Jones; Instructors Childs, Dickson, Everson, Gerloff, Greene, Hackler, L. Parker, and Smith.

Southeast Area Extension Office, Chanute

Herman W. Westmeyer, Area Extension Director

Associate Professor Kilgore; Assistant Professors Appleby, Baughman, Bittel, Bratton, Brazle, Robbins, Rowland, Spalding, and Treat; Instructors Appleby, Dawson, Mullen, and Strickler.

County Extension Offices. County Extension work is designed to take 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. These offices are staffed with two or more county Extension agents. County Extension positions in these offices may include any or all of the following: county Extension director, agricultural agent, home economist, 4-H agent, and horticultural agent. The professional persons holding these positions are members of the faculty of Kansas State University and hold the academic rank of instructor.

County Extension work is financed by federal, state and local tax funds. A local nine-member executive board aids in directing the programs and activities of the county Extension professional staff.

In addition to the problem-solving responsibility, local Extension professionals assist local persons in organizing group action to help solve community problems.

Probably no greater opportunity exists for a professional person to express himself through working with local people. A tremendous amount of self-satisfaction is gained by Extension professionals when viewing the results of their efforts as they help people—individually and collectively—from all races and income levels—move from where they are to where they want to be.

Faculty and Administration

Includes only those with rank of Instructor or above.

Reading Key—Academic ranks are abbreviated as follows: Professor, Prof.; Associate Professor, Assoc. Prof.; Assistant Professor, Asst. Prof.; Instructor, Instr. Academic ranks are current as of January, 1978. The first year listed in parentheses following the title is the date of initial employment at KSU; subsequent yearly dates (if any) are dates of appointment to higher academic ranks or to new positions. (GF) following a person's listing means he or she is a member of the Graduate Faculty; such persons also are designated as Graduate Faculty members in the body of the catalog by placement of asterisks following their names.

Officers of Administration

ACKER, DUANE, President (1975). BS 1952, MS 1953, Iowa St. Univ.; PhD 1957, Okla. St. Univ.

ALLDWAY, JAY E., Instr., Computing Center (1970). BS 1970, Kan. St. Univ.

ARHEART, KRISTOPHER L., Instr. and Mgr. of Information Services, Computing Center (1973). BS 1970, MS 1973, Kan. St. Univ.

BEATTY, DANIEL D., Vice Pres. for Business Affairs; Prof. of Business Administration (1956, 1959, 1972). AB 1947, Hope Col.; MBA 1949, Univ. of Mich.

BECK, GLENN H., Vice Pres. for Agriculture Emeritus (1936, 1965, 1977). BS 1936, Univ. of Idaho; MS 1938, Kan. St. Univ.; PhD 1950, Cornell Univ.

BONEBRAKE, CASE A., Dir. of Physical Plant (1947, 1967). BS 1947, BS 1955, Kan. St. Univ.

BRDADIE, CYNDY S., Instr.; Asst. Dir. of Admissions (1977). BS 1974, MS 1977, Kan. St. Univ.

BROWN, WILBUR E., Asst. Prof.; Dir., Student Publications (1970). BS 1949, Kan. St. Univ.

CHALMERS, JOHN, Vice Pres. for Academic Affairs; Prof. of Economics (1963, 1969). AB 1938, Middlebury Col.; PhD 1943, Cornell Univ. (GF)

CONRDW, KENNETH, Assoc. Dir. and Mgr. of User Services, Computing Center (1974, 1976); Assoc. Prof. of Computer Science (1961, 1964). BA 1954, Swarthmore Col.; PhD 1957, Univ. of Ill. (GF)

COOL, VINCENT J., Asst. Vice Pres. for Planning; Asst. Prof. of Architecture (1957, 1967). BS 1951, Kan. St. Univ.; Registered Architect, 1952.

DALLAM, JERALD, Instr., Assoc. Dir. of Records, Instr. (1968). BS 1959, Northwest Mo. St. Col.; MS 1964, Okla. St. Univ.

DEVORE, JOHN J., Instr., Mgr. of Programming Services, Computing Center (1973). BS 1970, MS 1973, Kan. St. Univ.

DODGE, THEODORE D., Asst. Prof., Dir., Budget Office (1946, 1957). BS 1940, Kan. St. Univ.; CPA 1954, Kansas.

ELKINS, RICHARD NELSON, Instr., Dir. of Admissions (1966, 1968). BS 1956, MS 1963, Kan. St. Univ.

FLINCHBAUGH, B.L., Asst. to the Pres.; Assoc. Prof. (1971, 1977). BS 1964, MS 1967, Penn. St. Univ.; PhD 1971, Purdue Univ.

FOSTER, DONALD E., Instr.; Dir. of Records (1965, 1968). BS 1960, MS 1961, Kan. St. Univ.

GALLAGHER, TOM L., Dir. of Computing Center; Assoc. Prof. of Computer Science (1970). BA 1953, MS 1954, North Tex. St. Col.; DSc 1967, Wash. Univ. (GF)

GARVIN, RICK L., Instr., Office of Educational Resources (1972). BA 1970, San Jose St. Col.

GERRITZ, ELLSWORTH M., Prof., Dean of Admissions and Records (1954, 1962). BE 1938, St. Cloud St. Teach. Col.; MS 1948, PhD 1951, Univ. of Minn. (GF)

GREEN, PATRICIA A., Instr., Asst. Dir. of Affirmative Action (1976). BS 1973, Univ. of Kan.

HAINES, RICHARD D., Asst. Prof., Dir., Office of Univ. Publications (1967). BS 1958, Kan. St. Univ.; MA 1976, Univ. of Minn.

HESS, H. DEAN, Dir. of Alumni Relations (1961). BS 1950, Kan. St. Univ.

HEYWOOD, KENNETH M., Dir., Endowment and Development (1956). BS 1938, Kan. St. Univ.; MA 1949, Univ. of Wyo.

HOYT, DONALD P., Prof., Dir., Office of Educational Resources (1968). BS 1948, Univ. of Ill.; MA 1950, PhD 1954, Univ. of Minn. (GF)

HURLEY, DOUGLAS E., Instr., Asst. Dir. of Records (1976). BA 1970, Miami Univ. of Ohio; ME 1976, Univ. of Vt.

IRVIN, H. HUGH, Instr., Computing Center (1973). BS 1972, Kan. St. Univ.

KEPPLE, MELVIN, Instr., Dir., Data Processing Center (1967). BS 1950, Washburn Univ.

KRIDER, JOHN A., Instr., Editor, Univ. Publications (1975). BA 1967, MS 1976, Kan. St. Univ.

KRUH, ROBERT F., Dean of the Graduate School; Prof. of Chemistry (1967). AB 1948, PhD 1951, Wash. Univ., St. Louis. (GF)

LAMBERT, JOHN P., Asst. Prof., Radiation Safety Officer (1964, 1976). BS 1959, Lebanon Valley Col.; MPH 1963, Univ. of Mich.; PhD 1975, Kan. St. Univ.

LARSON, VERNON C., Prof., Chairperson, Council on International Activities (1976). BS 1947, MS 1950, PhD 1954, Mich. St. Univ.

LIPP, MARK E., Instr., Asst. Dir., Data Processing Center (1972, 1976). BS 1969, Kan. St. Univ.

McCAIN, JAMES ALLEN, President Emeritus (1950, 1975). AB 1926, LLD 1951, Wofford Col.; MA 1929, Duke Univ.; EdD 1948, Stanford Univ.; LLD 1964, Univ. of Mont.; DSc 1967, Andhra Pradesh St. Univ. (India); LLD 1965, Colo. St. Univ.

MILBOURN, MAX W., Asst. to the Pres.; Assoc. Prof. of Journalism (1949, 1957). AB 1938, Univ. of Wichita.

MILLER, MICHAEL H., Assoc. Dir. of Computing Center (1964, 1966, 1976). Asst. Prof. of Computer Science (1960, 1965). BS 1958, MS 1960, Iowa St. Univ.

MITCHELL, ROGER L., Prof., Vice Pres. for Agriculture (1975). BS 1954, Iowa St. Univ.; MS 1958, Cornell; PhD 1961, Iowa St. Univ.

MURRY, JOHN P., Asst. Prof., Assoc. Dean for Sponsored Programs, Graduate School (1957, 1977). BS 1955, Rockhurst Col.; MS 1960, PhD 1971, Kan. St. Univ.

NOONAN, JOHN P., Assoc. Dean of Graduate School (1947, 1966); Prof. of English (1968). BS 1947, Rockhurst Col.; MS 1950, Kan. St. Univ.; PhD 1955, Denver Univ. (GF)

OWENS, RICHARD E., Prof., Office of Educational Resources (1964, 1969, 1976). AB, BS 1949, Northwest Mo. St. Col.; MS 1953, EdD 1964, Colo. St. Col. (GF)

PERRY, RALPH H., Asst. Prof., Comptroller (1946, 1953, 1962). BS 1946, Kan. St. Univ.

RAUSCH, DIANE K., Instr., Acting Dir. of Affirmative Action (1976). BA 1965, Simpson Col.; MLS 1966, Univ. of Wis.; MS 1974, PhD 1977, Kan. St. Univ.

ROCHAT, CARL ROBERT, Dir., Office of Univ. News; Assoc. Prof. of Journalism (1953, 1963). BS 1940, Kan. St. Univ.; MS 1948, Univ. of Ill.

RUGGLES, BERTRAM L., Asst. Prof., Dir., Employee Relations (1972). BS 1942, Iowa St. Univ.; MS 1950, American Univ.

SEATON, RICHARD H., University Attorney (1971). AB 1959, Harvard Col.; LLB 1963, Harvard Law School.

SMITH, JOYCE E., Instr., Asst. Dir. of Admissions (1976). BS 1975, MS 1976, Kan. St. Univ.

STEHLEY, DONALD R., Assoc. Dir. of Alumni Relations (1961, 1966). BS 1950, Kan. St. Univ.

STONE, R. GLEN, Instr., Dir., Office of Sports Information (1973). BS 1967, Univ. of Okla.

SWITZER, VERYL A., Asst. Prof., Assoc. Dean for Univ. Minority Affairs (1969, 1973). BS 1954, MS 1974, Kan. St. Univ.

TAOTMAN, EMERSON L., Dir., Personnel Services (1964, 1969).

TARRANT, DONALD H., Instr., Asst. Dir., Office of Educational Resources (1970, 1976). BS 1948, Morningside Col.; MS 1959, Iowa St. Univ.

THOMPSON, DOROTHY, Instr., Dir. of Affirmative Action for Women (1972). BS 1959, Wis. St. Univ.; MA 1965, Univ. of Wyo.

WEBER, ARTHUR D., Vice Pres. Emeritus (1924, 1963). BS 1922, MS 1926, Kan. St. Univ.; PhD 1940, DSc 1950, Purdue Univ.

WEIGEL, LARRY N., Assoc. Dir., Endowment and Development (1976). BS 1967, MS 1968, Kan. St. Univ.

WOODWARD, JANET R., Instr., Information Asst. to the President (1976). AB 1962, Univ. of No. Colo., MS 1975, Kan. St. Univ.

YOUNG, PAUL M., Prof., Vice Pres., Univ. Facilities; Prof. of Mathematics (1947, 1970). AB 1937, Miami Univ.; MA 1939, PhD 1941, Ohio St. Univ. (GF)

Library Faculty

AYERS, JUDITH L., Instr., Univ. Library (1977). BA 1971, Fort Hays St. Univ.; ML 1975, Emporia St. Univ.

BATSON, CONNIE HINES, Instr., Univ. Library (1973). BME 1965, Univ. of Kan.; MLS 1973, Emporia St. Univ.

BLANDING, SYLVIA J., Instr., Univ. Library (1972). BA 1970, Kan. Wesleyan; MLS 1971, Emporia St. Univ.

BROWN, JANET L., Instr., Univ. Library (1976). BA 1974, Wichita St. Univ.; MLS 1975, Emporia St. Univ.

FARMER, DIANA M., Instr., Univ. Library (1972). BA 1971, MLS 1972, Emporia St. Univ.
FRANCO, CARDLE A., Asst. Prof., Univ Library (1971, 1976). AB 196B, Baker Univ.; MLS 1969, Emporia St. Univ.
FRIESNER, VIRGINIA G., Instr., Univ. Library (1972). BA 1971, Kan. Wesleyan; MLS 1972, Univ. of Ill.
HDLTZ, JEROME E., Instr., Univ Library (1974). BA 1972, Penn. St. Univ.; MLS 1974, Univ. of Pittsburgh.
JENKINS, LAVERNE C., Instr., Univ Library (1977). BA 1968, Bennett Col.; ML 1975, Univ of S. Car.
JDHNSDN, JDHN L., Asst. Prof., Univ. Library (1969, 1977). BA 1967, MA 1973, Kan. St. Univ.
KITTERMAN, INGRID K., Instr., Univ. Library (1977). BA 1973, MLS 1975, Univ. of Ariz.
LITCHFIELD, MEREDITH C., Assoc. Prof., Univ. Library (1967, 197D, 1975). BS 195D, MS 1967, Emporia St. Univ.
LDWE, VALERA L., Instr., Univ Library (1974). BS 1972, MLS 1974, Univ of Me.
LU, JAMES Y., Asst Prof., Univ. Library (1969, 1975). BA 1960, Tamkang Col.; MLS 1965, MS 1970, Emporia St. Univ.
McDDNALD, DAVID R., Instr., Univ. Library (1976). BA 1973, Calif. St. Univ., Long Beach; MA 1974, Wash. St. Univ.; MLS 1975, Univ. of Ore.
MORELAND, RACHEL S., Asst. Prof., Univ. Library (1971, 1977). BS 1955, Univ. of Ariz.; MS 197D, Kan. St. Univ
PIGND, ANTDNIA, Instr., Univ Library (1975). BA 196B, St. Univ. of N.Y., Stony Brook; MA 1971, Kan. St. Univ.
QUIRING, VIRGINIA M., Asst. Prof., Univ. Library (1971, 1975). BA 1943, Ottawa Univ., MLS 1971, Emporia St. Univ.
RAUSCH, G. JAY, Prof., Dean, Univ. Library (1973). BA 1955, North Central Col., MA 195B, PhD 196D, MLS 1961, Univ. of Ill. (GF)
RICHARDS, ARNE H., Assoc. Prof., Univ Library (1965, 1975). BA 1954, Yankton Col., MLS 196D, Univ of Ill.
RDHRER, RICHARD L., Asst. Prof., Univ Library (1968, 1973). BS 1960, MLS 1968, Emporia St. Univ.
SCDTT, ANN, Instr., Univ Library (1973). BA 1964, MA 197D, Kan. St. Univ.
SCHWEITZBERGER, KATHLEEN A., Instr., Univ. Library (1977). BS 1973, Univ of Kan., MLS 1976, Emporia St Univ.
TAYLDR, ELLYN M., Asst. Prof., Univ Library (1957, 1958, 1974). BS 193B, Emporia St Univ
VANDER VELDE, JDHN J., Asst. Prof , Univ Library (1968, 1974). BA 1967, ML 1968, Emporia St Univ.
VDTH, SALLY J., Asst. Prof., Univ. Library (1974, 1977). BA 1962, Kan. St. Univ., MS 1973, Emporia Sf. Univ.
WHITE, NEVA L., Prof., Univ. Library (1966, 1970, 1976). AB 1944, Goshen Col.; AB in LS 1946, Univ. of Mich.
WILDE, LUCY M., Asst. Prof , Univ Library (1967, 1973). BA 1965, Avila Col.; MLS 1967, Rosary Col.
WILLIAMS, EVAN W., Asst. Prof., Univ Library (1964, 1971) AB 1955, Wash. Univ., MLS 1956, Univ. of Ill.

Student Personnel Services Faculty

AOAMS, TERRY R., Instr., Food Service Dir., K-State Union (1975). BS 1971, Southern Ore. St.
AKIN, JAMES N., Assoc. Dir., Career Planning and Placement Center (1966). BS 196D, MS 1964, Kan. St. Univ
AUGUSTYN, LOREN L., Assoc. Prof., Student Health Center (1976). BS 195D, Neb. St.; MD 1954, Creighton Univ
BIRNBAUM, ROGER D., Admin. Asst., Student Health Center (1976). BA 197D, Southwestern St. Okla.
BOSCO, PAT J., Instr., Asst. Dean of Students, Center for Student Development (1972, 1976). BS 1971, MS 1973, Kan. St. Univ.
BRADSHAW, MICHAEL H., Instr., Asst. Dir. Health Education, Student Health Center (1971). BS 1968, MH Ed 1971, Brigham Young Univ.
BRETTELL, J. ALLAN, Foreign Student Adviser; Asst. Prof., Center for Student Development (1966). BA 1949, MS 1951, Westminster Col.
BUTLER, GLENDA S., Asst. Dir., Student Financial Assistance (1976). BS Ed 1974, MS 1975, Emporia St. Univ.
CHABARRIA, GILBERT R., Instr., Center for Student Development (1976). BS 1973, MS 1974, Kan. St. Univ.
OANSKIN, OAVID G., Prof., Center for Student Development (1959, 1966, 1968). AB 195D, Univ. of Redlands; MA 1951, PhD 1954, Dhio St. Univ. (GF)
DOWNEY, RONALO G., Asst. Prof., Center for Student Development (1975). BA 1966, Univ. of Tex.; MA 1968, PhD 1971, Temple Univ.
EDWAROS, A. THORNTON, Dir. Emeritus of Housing (1945, 1949, 1974). BS 1941, MS 1946, Kan. St. Univ.
FRITH, THOMAS J., Asst. Prof., Dir. of Housing (1965, 1974). BA 1960, MA 1963, EdS 1965, Univ. of Iowa.
HARMS, WILLIAM B., Intramurals Coord. (1974). BA 1968, Kearney St. Col.; MA 1971, Colo. St. Univ.; PhD 1977, Kan. St. Univ.
HERMES, STEVEN E., Asst. Dir., K-State Union (1973). BA 1969, MS 1971, Kan. St. Univ.
KERR, WENDELL ROBERT, Asst. Dir., Housing; Asst. Prof. of Education (1947, 1957). BS 1947, MS 1951, Kan. St. Univ.
KIOD, SANDRA L.B., Instr., Center for Student Development (1976). BS 1972, MS 1974, Kan. St. Univ.
KRAUS, OAVIO K., Asst. Dir., Career Planning and Placement Center (1977). BA 1970, MBA 1972, Kan. St. Univ.
LACY, BURRITT S., JR., Psychiatrist, Student Health Center (1964). BA 1941, Harvard Univ.; MD 1944, Cornell Univ.; 1951, American Board of Psychiatry and Neurology.
LAFENE, BENJAMIN WILLIAM, Dir. Emeritus, Student Health Center (1946, 194B, 1962). BS 1923, Mich. St. Univ., MD 1931, Western Reserve Univ
LAUGHLIN, J. BRUCE, Asst. Prof., Dir., Career Planning and Placement Center (1962, 1966). BS 195D, Univ. of Kan.; MS 1961, Kan. St. Univ.; JD 1967, Washburn Univ.
LILLY, JERRY A., Instr., Administrative Asst., Vice Pres. for Student Affairs (1967). BS Ed 1964, Concord Col.
LYNCH, MICHAEL L., Assoc. Prof., Center for Student Development (1972, 1977). BS 1967, MS 1968, EdD 1972, Ind. Univ
MARTIN, DANIEL C., Assoc. Prof., Student Health Center (1976). BS 1952, Arkadelphia Univ.; MD 1958, Univ. of Kan.
McCDRMICK, ALLEN C., Asst. Prof., Center for Student Development (1977). BA 1961, Clark Col., MA 1963, Atlanta Univ.; PhD 1976, Kan. St. Univ
McCDY, DDNALD E., Assoc. Prof., Student Health Center (1970). BS 1937, MD 1945, Univ of Kan.
McKNIGHT, DAVID E., Radiologist, Student Health Center (1972). DVM 1954, Kan. St. Univ., MD 1962, Univ. of Kan.
McMANIS, HELEN L., Instr., Dietitian, Housing (1966, 1971). BS 1941, MS 1972, Kan St. Univ.
MITCHELL, SHARLENE K., Instr., Residence Hall Complex Coord. (1969). BS 1968, MS 1971, Kan. St. Univ
MOLT, MARY, Instr., Dietitian, Housing (1973). BS 1971, Kearney St. Col.; MS 1973, Univ of Okla
NDLTING, EARL, JR., Assoc. Prof., Dir., Center for Student Development; Dean of Students (1974). BS 1959, MS 1961, Ind. Univ.; PhD 1967, Univ. of Minn. (GF)
NORDIN, MARGARET N., Assoc. Prof., Assoc. Dir., Center for Student Development; Dean of Women (1957). BS 1941, MA 1953, PhD 1962, Univ of Minn. (GF)
NOVAK, MICHAEL A., Dir., Student Financial Assistance (1969, 1976). BS 1966, MS 1969, Kan. St. Univ
OGG, WILLIAM D., Instr., Center for Student Development (1965). BS 1956, MS 1964, Kan. St. Univ
OLIVERSON, LARRY R., Asst. Prof., Student Health Center (1975). BS 1964, Kan. St. Univ.; MS 1972, PhD 1975, Univ. of Kan.
PEINE, CARDLINE F., Instr., Center for Student Development (1961). AB 1947, Carleton Col.; MS 1951, Kan St. Univ
PENCE, JDHN T., Instr., Dietitian, Housing (1963, 1971). BS 1963, Purdue Univ., MS 197D, Kan. St. Univ
PESCI, PATRICK, Instr., Dietitian, Housing (1975). BS 1973, Indiana Univ. of Pa.
PETERS, CHESTER E., Prof., Vice Pres. for Student Affairs (1947, 1953, 1962, 1967). BS 1947, MS 1950, Kan. St. Univ ; PhD 1953, Univ of Wis
PETERSON, JACK T., Consulting Pathologist, Student Health Center (1965). AB, MD, 195D, Univ. of Kan
PHILLIPS, STEPHEN B., Assoc. Prof., Chief, Clinical Medicine, Student Health Center (1967). AB 1942, MD 1945, Univ of Kan.
RIGGS, JEAN M., Assoc Dir , Housing and Dir., Food Service; Assoc. Prof. of Institutional Management (196D, 1974). BS 1939, MS 1956, Iowa St. Univ.
ROBEL, RAYDDN H., Dir., Recreational Services (197D, 1973). BS 1965, MS 197D, Kan. St. Univ.
ROBYAK, JAMES E., Asst. Prof., Center for Student Development (1975, 1977). BA 1966, St. Vincent Col.; MS 1973, PhD 1976, Univ of Utah.
ROOF, DONALD B., Instr., Residence Hall Complex Coord. (1964). BS 1964, Kan. St. Univ.
SCHUETTE, CLIFFDRD G., Asst. Prof., Center for Student Development (1975). AA 1967, Del Mar Comm. Col ; BBA 1969, Univ. of Tex.-Austin; MS 1973, EdD 1975, East Tex. St. Univ.
SHERRARD, PETER A.D., Asst. Prof., Center for Student Development (1973). AB 1961, Wheaton Col.; MDiv 1967, ThM 1971, Princeton Theological Seminary, EdD 1973, Univ. of Mass.-Amherst.
SILLS, JACK L., Asst Dir., K-State Union (1973). AB 1958, Kan. Wesleyan Univ.
SINCLAIR, ROBERT E., Prof., Dir., Student Health Center (197D). BA 1948, MD 1952, Ohio St. Univ.
SINNETT, E. RDBERT, Asst. Dir., Mental Health Section, Student Health Center; Prof. of Psychology (1962). AB 1948, Univ. of Iowa; MA 195D, PhD 1953, Univ. of Mich.
SMITH, WALTER D., Dir., K-State Union (1957, 1973). BA 195D, Kan. Wesleyan Univ.
STRONG, MABEL B., Instr., Residence Hall Complex Coord. (1961, 1964). BS 1961, Kan. St. Univ.
SWITZER, VERYL A., Asst Prof., Assoc. Dean for Univ. Minority Affairs (1969, 1973). BS 1954, MS 1974, Kan. St. Univ.
TORRENCE, BARBARA, Instr., Dietitian, Housing (1974). BS 1973, MS 1975, Kan. St Univ.
TOUT, ROBERT C., Assoc. Prof., Student Health Center (1977). BS 1949, West Tex. St. Univ.; MD 1953, Southwestern Med. School, Univ. of Tex.-Dallas.
TROTTER, MARILYN B., Instr., Asst. Dir., Center for Student Development (1967, 1975). BS 1965, MS 1967, Kan. St. Univ.
UPHAM, JAMES A., Assoc. Dir., Student Financial Assistance (1967, 1969). BS 1943, MS 1969, Kan. St. Univ.

Intercollegiate Athletics Faculty

AKERS, JUDY, Basketball Coach (1970, 1974). BS 1967, MS 1970, Kan. St. Univ.
ANDERSON, BARRY, Track Coach (1974). BS 1974, Kan. St. Univ.
BAKER, DAVID E., Head Baseball Coach (1977). BS 196B, MS 1969, Emporia St. Univ.
BOCCHI, DON, Academic Counselor (1976, 1977). BA 1969, Duquesne Univ.; MS 1970, Univ. of Wis.
COLBERT, CONRAD, Asst. Athletic Dir. and Business Manager (1976). BBA 1960, Univ. of Iowa.
DARNELL, GARY B., Asst. Football Coach (1977). BA 197D, Okla. St. Univ.
DICKEY, JAMES H., Head Football Coach (1977). BS 1956, Univ. of Houston.
DRIESBACH, CHARLES R., Asst. Football Coach (1976). BS 1975, Villanova Univ.

DWIGHT, MARY PHYL, Volleyball and Softball Coach (1975). BS 1974, SWMSU; MS 1975, Kan. St. Univ.

EAOS, JAMES L., Asst. Basketball Coach (1975). BS 1967, NE Dkla. Univ.

FOGLER, RONALO, Head Golf Coach (1977).

GOERING, REBEKAH, Instr., Trainer (1975). BS 1974, Kan. St. Univ.

HABIGER, JANE, Assoc. Dir., Dffice of Sports Information (1974). BS 1972, Kan. St. Univ.

HARTMAN, JOHN HOWARO, Head Basketball Coach (197D). BS 1950, MS 1954, Dkla. St. Univ.

HOWE, JEROME E., Asst. Track Coach (1976). BS 1972, MS 1975, Kan. St. Univ.

JERMIER, JOHN, Dir. of Athletics (1976). BS 1959, Coe Col.; MS 1965, Univ. of Tex.

KRUGER, LON D., Asst. Basketball Coach (1977). BS 1975, Kan. St. Univ.; MS 1977, Pittsburg St. Univ.

LATIMORE, MARION L., Asst. Football Coach (1975). BS 1972, Kan. St. Univ.

MORGAN, LAURENCE, Instr., Head Trainer (1951, 1957). BS 1949, St. Ambrose Col.

NAY, MERLE O., Asst. Athletic Director (1977). BS 1957, Kan. St. Univ.

REINER, MARK, Asst. Basketball Coach (1976). BS 1963, N.Y. Univ.; MA 1966, Brooklyn Col.

ROSS, MICHAEL, Head Track Coach (1975, 1976). BS 1971, Kan. St. Univ.; MS 1973, Eastern Ky. Univ.

RUDO, JAMES D., Football Trainer (1977). BS 1973, St. Lawrence Univ.

SCHROEDER, JANE, Asst. Basketball Coach (1975). BS 1971, Kan. St. Univ.

SELMER, CARL F., Asst. Football Coach (1977). BS 1945, MA 1956, Univ. of Minn.; BA 1948, Univ. of Wyo.

SEYBOLD, SAMUEL A., Intern Athl. Admin. (1977). BS 1975, Kan. St. Univ.

SNODGRASS, STEPHEN E., Head Tennis Coach (1976). BS 1970, Kan. St. Univ.

STALLARD, LYNN M., Instr., Trainer (1977). BS 1974, Pittsburg St. Univ.

STONE, ROYAL G., Dir., Dffice of Sports Information (1973). BA 1967, Univ. of Dkla.

VanLANINGHAM, MAX, Asst. Fund Raiser (1977). BS 1966, MS 1967, Ft. Hays. St. Univ.

WILLYARD, JOHN D., Asst. Football Coach (1977). BS 1976, Cameron Univ.

WALSTAO, GEORGE, Asst. Football Coach (1975). BS 1963, Dkla. St. Univ.; MA 1968, Wichita St. Univ.

College of Agriculture

ABLE, BILLY V., Assoc. Prof. of Animal Sciences and Industry (197D, 1973). BS 1962, Dkla. St. Univ.; MS 1964, Miss. St. Univ.; PhD 1970, Univ. of Ky. (GF)

ABMEYER, ERWIN, Asst. Prof. of Horticulture Emeritus (1934, 1978). BS 1933, Kan. St. Univ.

AOAMS, ALBERT W., Prof. of Animal Sciences and Industry; Research Poultry Scientist, Agr. Exp. Sta. (1962, 1976). BS 1951, MS 1955, Kan. St. Univ.; PhD 1964, S.D. St. Univ. (GF)

ALLEE, GARY L., Assoc. Prof. of Animal Sciences and Industry; Research Swine Nutritionist, Agr. Exp. Sta. (197D, 1975). BS 1966, MS 1967, Univ. of Mo.; PhD 1970, Univ. of III. (GF)

ALLEN, OELORAN M., Assoc. Prof. of Animal Sciences and Industry; Meat Animal Research Scientist, Agr. Exp. Sta. (1966, 197D). BS 1961, Kan. St. Univ.; MS 1963, Univ. of Idaho; PhD 1966, Mich. St. Univ. (GF)

AMES, DAVIO R., Assoc. Prof. of Animal Sciences and Industry; Research Environmental Physiologist and Sheep Research, Agr. Exp. Sta. (1969). BS 1964, MS 1966, Dhio Sf. Univ.; PhD 196B, Mich. St. Univ. (GF)

ANOERSON, KLING L., Prof. of Agronomy Emeritus (1936, 1967). BS 1936, Univ. of Calif.; MS 1938, Kan. St. Univ.; PhD 1951, Univ. of Neb.

ARMBRUST, DEAN V., Asst. Prof. of Agronomy; Research Soil Scientist, Wind Erosion Laboratory, U.S.D.A., Agricultural Research Service (196B, 1975). BS 1960, MS 1961, PhD 1973, Kan. St. Univ. (Adjunct Appointment) (GF)

ATKINSON, C. HARRY, Assoc. Prof. of Agronomy Emeritus (1949, 1976). BS 1931, MS 1933, Pa. Sf. Univ.

AUBEL, CLIFF E., Prof. of Animal Sciences and Industry Emeritus (1915, 1961). BS 1915, Pa. St. Univ.; MS 1917, Kan. St. Univ.; PhD 1931, Univ. of Minn.

AXELTON, MILBURNE C., Asst. Prof. of Agronomy Emeritus (1929, 1970). BS 192B, Kan. St. Univ.

BALL, JAMES E., Instr. of Agronomy; Research Agronomist, Sandyland Experimental Field (P.D. St. John). Agr. Exp. Sta. (1977). BS 1966, MS 1969, Kan. St. Univ.

BANBURY, EVANS E., Prof.; Head, Colby Branch Agr. Exp. Sta. (1946, 1977). BS 194D, Kan. St. Univ.

BARNETT, FRANCIS L., Assoc. Prof. of Agronomy; Forage Research Geneticist, Agr. Exp. Sta. (1956, 1959). BS 1952, McGill Univ. (Canada); MS 1954, PhD 1956, Pa. St. Univ. (GF)

BARTLEY, ERLE E., Prof. of Animal Sciences and Industry; Dairy Cattle Research Nutritionist, Agr. Exp. Sta. (1949, 195B). BS 1944, Allahabad Univ. (India); MS 1946, PhD 1949, Iowa St. Univ. (GF)

BASSETTE, RICHARD, Prof. of Animal Sciences and Industry; Dairy Foods Research Chemist, Agr. Exp. Sta. (195B, 1964). BS 1952, MS 1955, PhD 195B, Univ. of Md. (GF)

BATES, LYNN S., Asst. Prof. of Grain Science and Industry; Research Biochemist, Agr. Expt. Sta. (1972). BS 1962, Heidelberg Col.; MS 1966, Purdue Univ.; PhD 1972, Kan. St. Univ.

BAXTER, WILLIAM M., Asst. Prol. and Assf. to the Head, Fort Hays Branch Agr. Exp. Sta. (1949, 1967). BS 1949, Kan. St. Univ.

BEAT, LARRY J., Instr. ol Animal Sciences and Industry; Kansas Artificial Breeding Service Unit, Agr. Exp. Sta. (1970). BS 1967, Kan. St. Univ.

BEHNKE, KEITH C., Asst. Prof. ol Grain Science and Industry; Feed Technology Research Scientist, Agr. Exp. Sta. (1977). BS 196B, MS 1973, PHD 1975, Kan. St. Univ.

BIOWELL, ORVILLE W., Prof. of Agronomy; Soil Survey Research Scientist, Agr. Exp. Sta. (195D, 1960). AB 194D, Dberlin Col.; BS 1942, PhD 1949, Dhio St. Univ. (GF)

BIERE, ARLO WILLIAM, Assoc. Prof. of Agricultural Economics; Research Agr. Econ., Natural Resources; Regional and Community Dev., Agr. Exp. Sta. (196B, 1973). BS 1963, Univ. of Neb.; MA 1967, PhD 196B, Univ. of Calif. (GF)

BLOCKER, H. DERRICK, Prof. of Entomology; Research Entomologist, Taxonomy of Leafhoppers and Grassland Insects, Agr. Exp. Sta. (1965, 1971, 1976). BS 1954, MS 195B, Clemson Univ.; PhD 1965, N.C. St. Univ. (GF)

BOLSEN, KEITH K., Assoc. Prof. of Animal Sciences and Industry; Beef Cattle Research Nutritionist, Agr. Exp. Sta. (1971, 1977). BS 1966, MS 1967, Univ. ol Ill.; PhD 1971, Univ. of Neb. (GF)

BRANDNER, LOWELL, Prof.; Agricultural Editor (1947, 1961). AB 1937, BS 1937, Emporia St. Univ.; MS 1951, Kan. St. Univ.; PhD 1960, Univ. of Wis. (GF)

BRENT, BENNY E., Prof. of Animal Sciences and Industry; Meat Animal Research Nutritionist, Agr. Exp. Sta. (1966, 1977). BS 1959, MS 1960, Kan. St. Univ.; PhD 1966, Mich. St. Univ. (GF)

BRETHDUR, JOHN R., Prof.; Beef Research Scientist, Fort Hays Branch Agr. Exp. Sta. (1957, 1975). BS 1955, Kan. St. Univ.; MS 1956, Dkla. St. Univ.

BROWDER, LEWIS E., Assoc. Prof. of Plant Pathology; Research Cereal Rust Plant Pathologist, U.S.D.A. Agricultural Research Service (1958, 1975). AS 1952, Cameron St. Agric. Col.; BS 1954, MS 1956, Dkla. St. Univ.; PhD 1965, Kan. St. Univ. (Adjunct Appointment) (GF)

BULLER, ORLAN H., Assoc. Prof. of Agricultural Economics; Research Agr. Econ., Farm Management, Production Economics, Agr. Exp. Sta. (1963, 1969). BS 1958, Kan. St. Univ.; MS 1959, PhD 1965, Mich. St. Univ. (GF)

BURCHETT, LOWELL A., Asst. Prof. of Agronomy; Crop Scientist, Kansas Crop Improvement Association, Agr. Exp. Sta. (1965, 1973). BS 1956, Dkla. St. Univ.; MS 1969, Kan. St. Univ.

CALL, EDWARD P., Assoc. Prof. of Animal Sciences and Industry; Dairy Cattle Research Physiologist, Agr. Exp. Sta. (1963, 196B). BS 1951, Dhio St. Univ.; PhD 1967, Kan. St. Univ.

CAMPBELL, ROBERT J., Asst. Prof. of Horticulture; Research Horticulturist, Floriculture, Agr. Exp. Sta. (1975). BS 1966, N.D. St. Univ.; MS 1969, PhD 1974, Univ. of Minn. (GF)

CAMPBELL, RONALD W., Prof.; Head, Department of Horticulture; Research Horticulturist, Agr. Exp. Sta. (1946, 1966). BS 1943, MS 1946, Kan. St. Univ.; PhD 1955, Mich. St. Univ. (GF)

CARPENTER, FRANK R., Assoc. Prof., Assoc. Dean, Col. of Agriculture (1961, 1977). BS 194B, MS 1951, Kan. St. Univ.; PhD 1967, Univ. of Mo. (GF)

CARROW, ROBERT N., Asst. Prof. of Horticulture; Research Horticulturist, Turfgrass, Agr. Exp. Sta. (1976). BS 1968, PhD 1972, Mich. St. Univ. (GF)

CASADY, ALFRED J., Prof. of Agronomy; Research Sorghum Geneticist, U.S.D.A. Agricultural Research Service (1949, 1970). BS 194B, MS 1950, PhD 1962, Kan. St. Univ. (Adjunct Appointment) (GF)

CHUNG, OKKYUNG, Assoc. Prof. of Grain Science and Industry; U.S.D.A. Grain Marketing Research Center (1976). BS 1959, EWHA Women's Univ., Korea; MS 1965, PhD 1973, Kan. St. Univ. (Adjunct Appointment) (GF)

CLAASSEN, MARK M., Asst. Prof. of Agronomy; Research Agronomist in charge, Cornbelt Experimental Field (P.D. Powhattan) Agr. Exp. Sta. (1977). BS 1965, Univ. of Neb.; MS 196B. PhD 1971, Iowa St. Univ.

CLAPP, ALFRED L., Prof. of Agronomy Emeritus (1915, 1961). BS 1914, MS 1934, Kan. St. Univ.

CLAYBERG, CARL O., Prof. of Horticulture; Research Horticulturist, Vegetable Crop Geneticist, Agr. Exp. Sta. (1974, 1977). BS 1954, Univ. of Wash.; PhD 195B, Univ. of Calif. (GF)

CLAYDON, THOMAS J., Prof. of Animal Sciences and Industry Emeritus (1946, 1975). BSA 1934, Univ. of Saskatchewan (Canada); MS 1936, PhD 1939, Iowa St. Univ.

CONORAY, JERRY L., Asst. Prof.; Research Agronomist, Weeds, Garden City Branch Agr. Exp. Sta. (1968). BS 1966, MS 196B, Kan. St. Univ.

COX, RUFUS F., Prof. of Animal Sciences and Industry Emeritus (193D, 1971). BS 1923, Dkla. St. Univ.; MS 1925, Iowa St. Univ.; PhD 1941, Cornell Univ.

CRAIG, JAMES V., Prof. of Animal Sciences and Industry; Poultry Research Geneticist, Agr. Exp. Sta. (1955, 196D). BS 194B, MS 1949, Univ. of III.; PhD 1952, Univ. of Wis. (GF)

CRESS, DONALD C., Assoc. Prof. of Entomology; Research Entomologist, Insects of SW Ks. (P.D. Garden City) Agr. Exp. Sta. (1977). BS 1964, Colo. St. Univ.; MS 1966, Univ. of Wyo.; PhD 1969, Dkla. St. Univ. (GF)

CUNNINGHAM, FRANKLIN E., Assoc. Prof. of Animal Sciences and Industry; Poultry Foods Research Scientist, Agr. Exp. Sta. (1969). BS 1957, Kan. St. Univ.; MS 1959, PhD 1963, Univ. of Mo. (GF)

DAVIS, OUANE L., Asst. Prof. of Animal Sciences and Industry; Swine Research Physiologist, Agr. Exp. Sta. (1977). BS 197D, MS 1974, Kan. St. Univ.; PhD 1976, Univ. of Mo.

DAVIS, GEORGE V., JR., Assoc. Prof.; Animal Research Scientist, Garden City Branch Agr. Exp. Sta. (1972). BS 196D, MS 1964, PhD 1972, Univ. of Ark.

DePEW, LESTER J., Asst. Prof. of Entomology; Research Entomologist, Insects of Southwestern Kansas (P.D. Garden City) Agr. Exp. Sta. (1954, 1959). BS 1949, Colo. A & M, MS 1954, Univ. of Minn.

DEYOE, CHARLES W., Prof., Head of Department ol Grain Science and Industry; Director of Food and Feed Grain Institute; Feed Technology Research Scientist, Agr. Exp. Sta. (1962, 1977). BS 1955, Kan. St. Univ.; MS 1957, PhD 1959, Tex. A & M Col. (GF)

DICKERSDN, JERRY D., Instr. of Agronomy; Research Agricultural Engineer, Wind Erosion Laboratory, U.S.D.A., Agricultural Research Service (197D). BS 1957, MS 1964, Kan. St. Univ. (Adjunct Appointment)

DICKERSON, OTTIE J., Prof. of Plant Pathology; Research Plant Nematologist, Agr. Exp. Sta. (1961, 1972). AS 1953, Ark. Poly. Col.; BSA 1955, MS 1956, Univ. of Ark.; PhD 1961, Univ. of Wis. (GF)

DIKEMAN, MICHAEL E., Assoc. Prof. of Animal Sciences and Industry; Meats Research Scientist, Agr. Exp. Sta. (1970, 1975). BS 1966, Kan. St. Univ.; MS 196B, Mich. St. Univ.; PhD 1970, Kan. St. Univ. (GF)

DODGE, GILBERT R., Asst. Prof. and Fiscal Dfficer, Dffice of Vice President for Agriculture (195B). BS 195D, Kan. St. Univ.; CPA 1957, Kansas.

DUITSMAN, W.W., Prof. and Head, Fort Hays Branch Agr. Exp. Sta. (1941, 1970). BS 1940, Kan. St. Univ.

EDMUNDS, LEON K., Prof. of Plant Pathology; Research Sorghum Plant Pathologist, U.S.D.A., Agricultural Research Service (196D, 196B, 1975). BS 1953, PhD 1958, Univ. of Wis. (GF) (Adjunct Appointment)

EHLER, STANLEY W., Asst. Prof. of Agronomy; Weed Control Research Scientist, Agr. Exp. Sta. (1972). BS 1962, MS 1964, Univ. of So. Ill.; PhD 1974, Univ. of Mo. (GF)

ELLIS, ROSCOE, JR., Prof. of Agronomy; Research Soil Chemist, Agr. Exp. Sta. (194B, 1960). BS 194B, MS 195D, Kan. St. Univ.; PhD 1952, Univ. of Wis. (GF)

ELZINGA, RICHARD J., Prol. of Entomology; Research Entomologist, Medical Insects and Mites, Agr. Exp. Sta. (1961, 1973). BS 1955, MS 1956, PhD 196D, Univ. of Utah. (GF)

ERHART, ANDREW B., Prof. Emeritus, Garden City Branch Agr. Exp. Sta. (1931, 1952, 1976) BS 1933, Kan. St. Univ.

ERICKSDN, DONALO B., Prof. ol Agricultural Economics; Research Agr. Econ., Livestock Marketing, Agr. Exp. Sta. (1966, 1975). BS 1955, MS 196D, Univ. ol Wyo.; PhD 1964, Purdue Univ. (GF)

ERPELDING, LAWRENCE H., JR., Asst. Prof.; Asst. Dean, College of Agriculture (1977). BS 1965, MS 1969, PhD 1972, Kan. St. Univ.

ESHBAUGH, ELBERT L., Asst. Prof. of Entomology Emeritus (1945, 1952, 1977). BS 1936, MS 1951, Kan. St. Univ.

EUSTACE, WALTER D., Assoc. Prof. of Grain Science and Industry; Milling Technology Research Scientist, Agr. Exp. Sta. (1973). BS 1959, MS 1962, PhD 1967, Kan. St. Univ.

EVERSMEYER, MERLE G., Asst. Prof. of Plant Pathology; Research Cereal Rust Plant Pathologist, U.S.D.A., Agricultural Research Service (1965). BS 1966, MS 1969, PhD 1971, Kan. St. Univ. (Adjunct Appointment) (GF)

FARMER, EARL L., Prof. of Animal Sciences and Industry; Dairy Cattle Research Physiologist, Agr. Exp. Sta. (1949, 196B). BS 194B, Univ. of Mo.; MS 1957, Kan. St. Univ.; PhD 1963, Univ. of Wis. (GF)

FARRELL, EUGENE PATRICK, Prof. of Grain Science and Industry; Milling Technology Research Scientist, Agr. Exp. Sta. (1949, 1967). BS 1935, MS 1952, Kan. St. Univ. (GF)

FILINGER, GEORGE A., Prof. of Horticulture Emeritus (1931, 1966). BS 1924, MS 1925, Kan. St. Univ.; PhD 1931, Ohio St. Univ.

FINNEY, KARL FREDERICK, Prof. of Grain Science and Industry; Research Chemist, U.S.D.A. Regional Hard Winter Wheat Laboratory (193B, 194B). AB 1935, Kan. Wesleyan Univ.; BS 1936, MS 1937, Kan. St. Univ. (Adjunct Appointment) (GF)

FRANSEN, STEVEN C., Instr.; Forage Crops Research Scientist, Southeast Kan. Branch Agr. Exp. Sta. (1975). BS 1973, MS 1975, Mont. St. Univ.

GALLAHER, HAROLD G., Prof., Head of Department of Forestry; Research Forester, Agr. Exp. Sta. (1966, 1977). BS 1949, Univ. of Mo.; MS 1959, Kan. St. Univ.

GALLAGHER, PATRICK J., Asst. Prof., Crops Research Agronomist, Tribune Branch Agr. Exp. Sta. (1977). BS 1969, MS 1971, PhD 1975, Kan. St. Univ.

GEYER, WAYNE A., Assoc. Prof. of Forestry; Research Forester, Ecology, Agr. Exp. Sta. (1966, 1975). BS 1955, Iowa St. Univ.; MS 1962, Purdue Univ.; PhD 1971, Univ. of Minn.

GOOD, DON L., Prof., Head of Department of Animal Sciences and Industry (1947, 1966). BS 1947, Ohio St. Univ.; MS 195D, Kan. St. Univ.; PhD 1956, Univ. of Minn. (GF)

GREENE, GERALD L., Prof. and Head, Garden City Branch Agr. Exp. Sta. (1976). BS 1959, MS 1961, Kan. St. Univ.; PhD 1966, Ore. St. Univ.

GREIG, JAMES K., JR., Prof. of Horticulture, Research Horticulturist, Vegetable Crops, Agr. Exp. Sta. (1952, 1969). BS 1949, MS 1950, Univ. of Ark., PhD 196D, Kan. St. Univ. (GF)

GWIN, ROY E., JR., Asst. Prof. and Head, Tribune Branch Agr. Exp. Sta. (1957, 1966). BS 1943, MS 1963, Kan. St. Univ.

HACKERDTT, HAROLD LERDY, Prof.; Sorghum Research Geneticist, Fort Hays Branch Agr. Exp. Sta. (1954, 197D). BS 1945, MS 1946, Kan. St. Univ.

HADLE, FRED BENTON, Asst. Prof. of Horticulture; Research Horticulturist, Farm Supt. Agr. Exp. Sta. (1951). BS 1951, MS 195B, Kan. St. Univ.

HAGEN, LAWRENCE J., Instr. of Agronomy, Research Agricultural Engineer, Wind Erosion Laboratory, U.S.D.A., Agricultural Research Service (1967). BS 1962, MS 1967, N.D. St. Univ. (Adjunct Appointment)

HANSING, EARL DAHL, Prof. of Plant Pathology, Cereal Crops Research Pathologist, Agr. Exp. Sta. (1935, 1947). BS 1933, Univ. of Minn., MS 1937, Kan. St. Univ., PhD 1941, Cornell Univ. (GF)

HARBERS, LENIEL H., Prof. of Animal Sciences and Industry; Meat Animal Research Nutritionist, Agr. Exp. Sta. (1964, 1976). BS 1957, MS 195B, Tex. A & M Col., PhD 1961, Okla. St. Univ. (GF)

HARVEY, T.L., Prof. of Entomology; Research Entomologist, Insects of North Central and Northwest Kan. (P.O. Hays), Agr. Exp. Sta. (1954, 197D). BS 195D, MS 1951, Kan. St. Univ., PhD 1963, Okla. St. Univ. (GF)

HATCHETT, JIMMY H., Assoc. Prof. of Entomology, Research Entomologist, U.S.D.A., Agricultural Research Service (1976). BS 1959, MS 1961, Okla. St. Univ.; PhD 1969, Purdue Univ. (Adjunct Appointment) (GF)

HEID, WALTER G., JR., Asst. Prof. of Agricultural Economics, Research Agr. Econ., U.S.D.A., Economic Research Service (1976). BS 1959, MS 196D, Univ. of Mo., PhD 1965, Univ. of Md. (Adjunct Appointment)

HERRON, GEORGE M., Assoc. Prof., Research Agronomist, Soil Testing, Garden City Branch Agr. Exp. Sta. (1956, 1971). BS 1949, MS 1950, Okla. St. Univ., PhD 196B, Univ. of Neb.

HESS, CARROLL V., Dean, College of Agriculture, Assoc. Dir., Agr. Exp. Sta. (1966). BS 1947, Pa. St. Univ., MS 194B, PhD 1953, Iowa St. Univ. (GF)

HEYNE, ELMER GEORGE, Prof. of Agronomy, Small Grains Research Geneticist, Agr. Exp. Sta. (1936, 1947). BS 1935, Univ. of Neb., MS 193B, Kan. St. Univ., PhD 1952, Univ. of Minn. (GF)

HINES, ROBERT H., Assoc. Prof. of Animal Sciences and Industry, Swine Research Scientist, Agr. Exp. Sta. (1966, 1969). BS 1957, Purdue Univ., MS 1961, PhD 1966, Mich. St. Univ. (GF)

HOBBS, JAMES A., Prof. of Agronomy, Soil Management Research Scientist, Agr. Exp. Sta. (1950, 1958). BS 1935, MS 194D, Univ. of Manitoba (Winnipeg); PhD 194B, Purdue Univ. (GF)

HOOVER, JIMMY D., Asst. Prof. of Animal Sciences and Industry (1966, 1973). BS 1961, MS 1970, Kan. St. Univ.

HOOVER, WILLIAM J., Prof. of Grain Science and Industry; Pres. American Institute of Baking (1966, 1976). BS 195D, MS 1954, PhD 1961, Univ. of Ill. (Adjunct Appointment)

HOPKINS, T.L., Prof. of Entomology, Research Entomologist, Insect Physiology, Toxicology, Radioisotope Tracers and Pesticidal Residues, Agr. Exp. Sta. (196D, 1970). BS 1951, MS 1956, Ore. St. Univ.; PhD 1960, Kan. St. Univ. (GF)

HORBER, ERNST K., Prof. of Entomology; Research Entomologist, Host-plant Resistance to Insects, Agr. Exp. Sta. (1970). BS 1945, DSc 1951, Swiss Fed. Inst. of Tech., PhD 1954, Kan. St. Univ. (GF)

HOSENEY, R. CARL, Prof. of Grain Science and Industry; Research Cereal Chemist, Agr. Exp. Sta. (1971, 1975). BS 1957, MS 196D, PhD 196B, Kan. St. Univ. (GF)

HOWE, HAROLD, Dean of Graduate School Emeritus; Prof. of Agricultural Economics Emeritus (1925, 1964). BS 1922, Kan. St. Univ.; MS 1923, Univ. of Md.; PhD 1937, Univ. of Wis.; LLD 195D, St. Benedict's Col.

HUNT, MELVIN C., Asst. Prof. of Animal Sciences and Industry; Meat Research Scientist, Agr. Exp. Sta. (1975). BS 1965, MS 1970, Kan. St. Univ.; PhD 1973, Univ. of Mo. (GF)

IBBETSON, R. WESLEY, Instr.; Research Dairy Scientist, Southeast Kan. Branch Agr. Exp. Sta. (1972). BS 1962, MS 1971, Kan. St. Univ.

JACKSON, WILLIAM P., Instr. of Animal Sciences and Industry; Kan. Artificial Breeding Service Unit, Agr. Exp. Sta. (1965). BS 1965, Colo. St. Univ.

JACOBS, HYDE S., Prof.; Head, Department of Agronomy, Dir., Evapotranspiration Lab., Research Soil Scientist, Agr. Exp. Sta. (1957, 1971). BSA 1952, MS 1953, Univ. of Id., PhD 1957, Mich. St. Univ. (GF)

JOHNSON, LOWELL B., Assoc. Prof. of Plant Pathology, Research Plant Disease Physiologist, Agr. Exp. Sta. (196B, 1971). BS 1957, Univ. of Ill.; MS 1962, PhD 1964, Purdue Univ. (GF)

JOHNSON, RICHARD J., Prof. and Head, Southeast Kansas Branch Agr. Exp. Sta. (1977). BS 196D, MS 1963, PhD 1967, Wash. St. Univ.

KADOUM, AHMED M., Asst. Prof. of Entomology; Research Entomologist in charge, Pesticide Residue Analysis Laboratory, Toxicology, Pesticidal Chemistry, Agr. Exp. Sta. (1966). BS 1958, Alexandria Univ., MS 1963, PhD 1966, Univ. of Neb. (GF)

KAHRS, AMOS J., Instr. of Animal Sciences and Industry; Poultry Research Farm Supt., Agr. Exp. Sta. (1956, 195B). BS 1953, Kan. St. Univ.

KANEMASU, EDWARD T., Assoc. Prof. of Agronomy, Research Micrometeorologist, Agr. Exp. Sta. (1969, 1974). BS 1962, MS 1964, Mont. St. Univ.; PhD 1969, Univ. of Wis. (GF)

KASTNER, CURTIS L., Asst. Prof. of Animal Sciences and Industry, Meat Research Scientist, Agr. Expt. Sta. (1975). BS 1967, MS 1969, PhD 1972, Okla. St. Univ. (GF)

KEEN, RAY A., Prof. of Horticulture, Research Horticulturist, Turfgrass, Agr. Exp. Sta. (1947, 1956). BS 1942, Kan. St. Univ.; MS 1947, PhD 1956, Ohio St. Univ. (GF)

KELLEY, KENNETH W., Instr., Crops and Soils Research Scientist, Southeast Kan. Br. Agr. Expt. Sta. (1975). BS 1967, MS 1973, Kan. St. Univ.

KELLEY, PAUL LED, Prof., Head, Department of Agricultural Economics, Research Economist, Agr. Exp. Sta. (1943, 1968). BS 1943, MS 1946, Kan. St. Univ., PhD 1956, Iowa St. Univ. (GF)

KHATAMIAN, HOUCHANG, Asst. Prof. of Horticulture (1977). BS 1965, Ege Univ., MS 1971, PhD 197B, Univ. of Guelph

KIRACOFE, GUY H., Assoc. Prof. of Animal Sciences and Industry, Animal Research Physiologist, Agr. Exp. Sta. (1966, 1969). BS 195B, MS 1960, Va. Polytechnic Inst., PhD 1965, Kan. St. Univ. (GF)

KNIGHT, DALE A., Assoc. Prof. of Agricultural Economics, Research Agr. Econ., Regional and Community Dev., Agr. Exp. Sta. (194B, 1957). BS 1945, Kan. St. Univ., MS 1946, Cornell Univ., AM 194B, PhD 1952, Univ. of Chicago (GF)

KNUTSON, HERBERT, Prof. of Entomology, Research Entomologist, Agr. Exp. Sta. (1953, 1976). AB 1936, Iowa Wesleyan Col., MS 1937, Southern Methodist Univ., PhD 1941, Univ. of Minn. (GF)

KOCH, BERL A., Prof. of Animal Sciences and Industry, Swine Research Nutritionist, Agr. Exp. Sta. (1956, 1963). BS 1949, Iowa St. Univ., MS 1951, Cornell Univ., PhD 1956, Univ. of Calif. (GF)

KOUDELE, JOSEPH WENDELL, Assoc. Prof. of Agricultural Economics, Research Agr. Econ., Consumption Economics and Marketing, Agr. Exp. Sta. (1947, 195B). BS 1943, Univ. of Neb., MS 1947, Univ. of Minn., PhD 1956, Mich. St. Univ. (GF)

KRDPF, DONALD HARRIS, Prof. of Animal Sciences and Industry, Meats Research Scientist, Agr. Exp. Sta. (1962, 1972). BS 1952, Univ. of Wis., MS 1953, Univ. of Fla., PhD 1956, Univ. of Wis. (GF)

LARSON, VERNON C., Prof., Office of Vice President for Agriculture, Dir., International Agricultural Programs (1962, 1970). BS 1947, MS 195D, PhD 1954, Mich. State Univ.

LAUNCHBAUGH, JOHN L., JR., Prof.; Range Research Ecologist, Fort Hays Branch Agr. Exp. Sta. (1955, 1967). AB 1947, MS 194B, Fort Hays St. Univ., PhD 1952, Tex. A & M Col.

LAWLESS, JOHN R., Assoc. Prof., Crops Research Scientist, Colby Branch Agr. Exp. Sta. (1960, 1975). BS 195B, Univ. of Neb., MS 196D, Wash. St. Univ.

LELAND, STANLEY E., JR., Assoc. Dir., Agr. Exp. Sta., Adjunct Prof., Infectious Diseases (1967, 1975). BS 1949, MS 1950, Univ. of Ill., PhD 1953, Mich. St. Univ. (GF)

LIANG, GEORGE H.L., Prof. of Agronomy, Research Cytogeneticist, Agr. Exp. Sta. (1964, 1977). BS 1956, Taiwan Provincial Col.; MS 1961, Univ. of Wyo., PhD 1964, Univ. of Wis. (GF)

LIVERS, RONALD W., Prof., Wheat Research Geneticist, Fort Hays Br. Agr. Exp. Sta. (1962, 1966). BS 194B, MS 1949, Kan. St. Univ., PhD 1957, Univ. of Minn.

LONG, CHARLES E., Asst. Prof. of Horticulture; Research Horticulturist, Herbicides, Agr. Exp. Sta. (1965, 1972). BS 1964, MS 1965, Okla. St. Univ., PhD 1972, Kan. St. Univ. (GF)

LUNDQUIST, MARVIN C., Asst. Prof. of Agronomy, Research Agronomist, Southwest Kan. Experimental Field (P.O. Minneola), Agr. Exp. Sta. (1951, 1975). BS 195D, MS 1952, Kan. St. Univ.

LYLES, LEON, Assoc. Prof. of Agronomy, Research Agricultural Engineer, Wind Erosion Laboratory, U.S.D.A., Agricultural Research Service (196B). BS 1955, Okla. St. Univ., MS 1959, Kan. St. Univ. (Adjunct Appointment) (GF)

MACKINTOSH, DAVID L., Prof. of Animal Sciences and Industry Emeritus (1921, 1965). BS 1920, Univ. of Minn., MS 1925, Kan. St. Univ.

MacMASTERS, MAJEL M., Prof. of Grain Science and Industry Emeritus (1960, 1970). BS 1926, MS 192B, PhD 1934, Univ. of Mass.

MADDUX, LARRY D., Asst. Prof. of Agronomy, Research Agronomist in charge, Kan. River Valley Experimental Field (P.O. Topeka), Agr. Exp. Sta. (1975). BS 1965, MS 1967, Okla. St. Univ., PhD 1973, Univ. of Neb.

MADER, ERNEST LEE, Prof. of Agronomy, Crops Research Scientist, Agr. Exp. Sta. (194B, 1968). BS 1936, MS 1944, Okla. St. Univ.; PhD 194B, Univ. of Neb. (GF)

MAHAFFEY, BEN D., Assoc. Prof. of Forestry (1972, 1976). BS 1963, Colo. St. Univ.; MS 1969, PhD 1972, Tex. A & M Univ. (GF)

MANUEL, MILTON LLOYD, Prof. of Agricultural Economics, Research Agr. Econ., Marketing and Agribusiness Management, Agr. Exp. Sta. (1945, 1959). BS 1941, MS 194B, Kan. St. Univ., PhD 1952, Univ. of Minn. (GF)

MARSHALL, JAMES T., JR., Asst. Prof. of Animal Sciences and Industry, Dairy Food Scientist, Agr. Exp. Sta. (1977). BS 1967, MS 1969, Texas Tech.; PhD 1973, Mich. St. Univ.

MARTIN, TERRY J., Asst. Prof., Research Plant Pathologist; Host-Parasite Geneticist, Fort Hays Br. Agr. Exp. Sta. (1974, 1977). BS 1970, Pittsburg St. Univ., MS 1971, Kan. St. Univ.; PhD 1974, Mich. St. Univ.

MARTIN, WILLARD HUNGATE, Prof. of Animal Sciences and Industry Emeritus (1925, 1964). BS 191B, Purdue Univ.; MS 1922, Pa. St. Univ.

MATTSON, RICHARD H., Assoc. Prof. of Horticulture; Research Horticulturist, Floriculture, Agr. Exp. Sta. (1969, 1975). BS 1964, Univ. of Neb.; PhD 1969, Univ. of Minn. (GF)

McCORMICK, DEWEY Z., Asst. Prof. of Animal Sciences and Industry Emeritus, International Agricultural Programs (1960, 196B). BS 1921, Kan. St. Univ.

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McGAUGHEY, WILLIAM H., Asst. Prof. of Entomology; Research Entomologist, U.S.D.A. Agricultural Research Service (1973). BS 1963, Tex. Tech. Col.; MS 1965, PhD 1967, Iowa St. Univ. (Adjunct Appointment) (GF)

McKEE, R. MILES, Prof. of Animal Sciences and Industry; Beef Cattle Research Scientist, Agr. Exp. Sta. (1959, 1975). BS 1951, MS 1963, Kan. St. Univ.; PhD 1967, Univ. of Ky.

MICHAELS, CHARLES L., Asst. Prof. of Animal Sciences and Industry; in charge, Kan. Artificial Breeding Service Unit, Agr. Exp. Sta. (1965, 1970). BS 1959, Kan. St. Univ

MILES, NEIL W., Assoc. Prof. of Horticulture; Research Horticulturist, Fruit and Nut Crops, Agr. Exp. Sta. (1966, 1973). BS 1959, MS 1964, PhD 1965, Univ. of Minn. (GF)

MILLER, BYRON S., Prof. of Grain Science and Industry; U.S.D.A., Grain Marketing Research Center (1977). BA 1939, Univ. of Neb.; MS 1942, Purdue Univ.; PhD 194B, Kan. St. Univ. (Adjunct Appointment)

MILLER, GERALD DALE, Asst. Prof. of Grain Science and Industry Emeritus (1946, 1973). BS 1924, Univ. of Neb.; MS 1953, Kan. St. Univ.

MILLS, ROBERT B., Prof. of Entomology; Research Entomologist, Stored Product Insects, Agr. Exp. Sta. (1963, 1970, 1976). BS 1949, Kan. St. Univ.; MEd 1953, Univ. of Colo.; PhD 1964, Kan. St. Univ. (GF)

MONGOLD, RONALD D., Instr. of Animal Sciences and Industry; Kan. Artificial Breeding Service Unit, Agr. Exp. Sta. (1971). BS 1966, Kan. St. Univ.

MONTGOMERY, GEORGE, Prof. of Agricultural Economics Emeritus (1926, 1972). BS 1925, MS 1927, Kan. St. Univ.; PhD 1954, Univ. of Minn.

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MUGLER, DAVID J., Assoc. Prof., Acting Dean, Col. of Agriculture (1965, 1977). BS 1959, Kan. St. Univ.; MS 1962, Univ. of Wis.; PhD 1969, Kan. St. Univ. (GF)

MUILENBURG, GRACE E., Assoc. Prof.; Assoc. Agricultural Editor (1969, 1974). BS 1947, Univ. of Kan.; MA 1969, Univ. of Mo., Columbia.

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OLSON, RAYMOND V., Prof. of Agronomy (1947, 1974). AB 1939, N.D. School of Forestry; BS 1941, N.D. St. Col.; MS 1942, PhD 1947, Univ. of Wis. (GF)

DRAZEM, FRANK, Prof. of Agricultural Economics; Research Agr. Econ., Production Economics; Regional and Community Dev., Agr. Exp. Sta. (1956, 1966). Cand. Rer. Pol., Dr. Rer. Pol., 1947, Karl Franzens Univ. (Graz, Austria); MS 1953, Kan. St. Univ.; PhD 1956, Iowa St. Univ. (GF)

OTTO, MERTON L., Assoc. Prof. of Agricultural Economics Emeritus (1939, 1967). BS 1921, MS 1942, Kan. St. Univ.

OVERLEY, CARL BENJAMIN, Assoc. Prof. of Agronomy; Research Crop Scientist, Foundation Seed Production, Agr. Exp. Sta. (1946, 1971). BS 1946, Kan. St. Univ.; MS 1967, Univ. of Neb

OWENSBY, CLENTON E., Assoc. Prof. of Agronomy; Range Management Research Agronomist, Agr. Exp. Sta. (1964, 1974). BS 1964, N.M. St. Univ.; PhD 1969, Kan. St. Univ. (GF)

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PENAS, PAUL E., Asst. Prof.; Research Agronomist, Irrigation, Garden City Branch Agr. Exp. Sta. (1967). BS 1959, MS 1967, Univ. of Neb.

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PFOST, HARRY B., Prof. of Grain Science and Industry; Feed Technology Research Engineer, Agr. Exp. Sta. (1959). BS 1940, Univ. of Mo.; MS 1948, Ala. Polytechnic Inst.; PhD 1959, Mich. St. Univ. (GF)

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PHILLIPS, WILLIAM M., Prof.; Acting Head, Fort Hays Branch Agr. Exp. Sta.; Research Agronomist, Weed Control. (1952, 1977). BS 1947, MS 1949, Kan. St. Univ.

PICKETT, WILLIAM F., Prof. of Horticulture Emeritus (191B, 1965). BS 1917, MS 1923, Kan. St. Univ.; PhD 1935, Mich. St. Univ.

PINE, WILFRED HAROLD, Prof. of Agricultural Economics; Research Agr. Econ., Natural Resources, Agr. Exp. Sta. (1934, 1949). BS 1934, MS 1938, Kan. St. Univ.; PhD 1948, Univ. of Minn. (GF)

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POMERANZ, YESHAJAHU, Prof. of Agronomy; Administrator, U.S.D.A. Grain Marketing Research Center (1973). BSC 1944, Inginieur 1945, Israeli Inst. of Tech.; PhD 1962, Kan. St. Univ. (Adjunct Appointment) (GF)

PONTE, JOSEPH G., Prof. of Grain Science and Industry; Baking Technology Research Scientist, Agr. Exp. Sta. (1975). AB 1956, Northwestern Univ.; MS 195B, Univ. of Minn. (GF)

POSLER, GERRY L., Assoc. Prof. of Agronomy; Forage Crops Research, Agr. Exp. Sta. (1974). BS 1964, MS 1966, Univ. of Mo.; PhD 1969, Iowa St. Univ. (GF)

POSTON, FREDDIE L., Asst. Prof. of Entomology; Research Entomologist, Field Crop Insects and Ecology, Agr. Exp. Sta. (1975). BS 1971, West Tex. St. Univ.; MS 1973, PhD 1975, Iowa St. Univ. (GF)

POWERS, WILLIAM L., Prof. of Agronomy; Dir., Kan. Water Resources Research Institute; Research Soil Physicist, Agr. Exp. Sta. (1966, 1970, 1976). BS 195B, Colo. St. Univ.; MS 1962, PhD 1966, Iowa St. Univ. (GF)

QUINLAN, LEON REED, Prof. of Landscape Architecture Emeritus (1927, 1965). BS 1921, Colo. St. Univ.; MLA 1925, Harvard Univ.

RAMOSKA, WILLIAM A., Asst. Prof. of Entomology; Research Entomologist, Insect Pathology, Agr. Exp. Sta. (1977). BS 1971, MS 1973, PhD 1975, Dhio St. Univ. (GF)

RANEY, ROBERT J., Assoc. Prof. of Agronomy; Research Agronomist in charge, Irrigation Experimental Field (P.D. Scandia), Agr. Exp. Sta. (1953, 1965). BS 1952, MS 1954, Kan. St. Univ.

RICHARDSON, ORAYTFORD, Prof. of Animal Sciences and Industry; Meat Animal Research Nutritionist, Agr. Exp. Sta. (1951). BS 193B, Clemson Agricultural Col.; MS 1950, PhD 1951, Iowa St. Univ. (GF)

RILEY, JACK G., Assoc. Prof. of Animal Sciences and Industry; Beef Cattle Research Scientist, Agr. Exp. Sta. (1971). BS 1962, MS 1963, PhD 196B, Univ. of Mo. (GF)

RILEY, JOHN B., Asst. Prof. of Agricultural Economics; Research Agr. Econ., Agribusiness Management, Agr. Exp. Sta. (1973). BS 1969, MS 1971, Va. Polytechnic Inst. and St. Univ.; PhD 1974, Dkla. St. Univ.

ROBERTS, HAROLD A., Asst. Prof. of Animal Sciences and Industry; In charge, Dairy Foods Processing Center and Dairy Foods Research Technologist, Agr. Exp. Sta. (1963, 1969). BS 1959, MS 1967, Kan. St. Univ.

ROBINSON, ROBERT J., Assoc. Prof. of Grain Science and Industry; Research Cereal Chemist, Agr. Exp. Sta. (1957, 1970). BS 1939, Shaw Univ.; HA 1949, Cornell Univ.; MA 195D, N.Y. Univ.; PhD 1957, Kan. St. Univ. (GF)

RUSS, OLIVER G., Assoc. Prof. of Agronomy; Weed Control Research Agronomist, Agr. Exp. Sta. (1949, 1965). BS 1950, MS 1953, Kan. St. Univ. (GF)

SANFORD, PAUL EVERETT, Prof. of Animal Sciences and Industry; Poultry Research Nutritionist, Agr. Exp. Sta. (1949, 196D). BS 1941, Kan. St. Univ.; MS 1942, PhD 1949, Iowa St. Univ. (GF)

SAUER, DAVID B., Asst. Prof. of Plant Pathology; Research Stored Grain Plant Pathologist, U.S.D.A. Agricultural Research Service (1967). BA 1961, Kent St. Univ.; MS 1964, PhD 1967, Univ. of Minn. (Adjunct Appointment) (GF)

SAUER, RICHARD J., Prof., Head of Department of Entomology; Research Entomologist, Agr. Exp. Sta. (1976). BS 1962, St. John's Univ.; MS 1964, Univ. of Mich.; PhD 1967, N.D. St. Univ. (GF)

SCHALLES, ROBERT R., Assoc. Prof. of Animal Sciences and Industry; Animal Breeding Research Scientist, Agr. Exp. Sta. (1966, 1970). BS 1963, Colo. St. Univ.; MS 1966, PhD 1966, Va. Polytechnic Inst. (GF)

SCHNAKE, LAWRENCE D., Asst. Prof. of Agricultural Economics; Research Agricultural Economist, Grain Marketing, U.S.D.A. Economic Research Service (1971). BS 196D, Univ. of Mo.; MS 1967, PhD 1972, Dkla. St. Univ. (Adjunct Appointment)

SCHRUBEN, LEONARD WILLIAM, Prof. of Agricultural Economics; Research Agr. Econ., Grain Marketing; Associate Dir., Food and Feed Grain Institute, Agr. Exp. Sta. (1949, 1951). BS 1939, Kan. St. Univ.; MS 194D, Univ. of Ill.; MPA 194B, MA 1949, PhD 1949, Harvard Univ. (GF)

SCHUENEMAN, THOMAS J., Asst. Prof. of Horticulture, Food Crops, Sedgwick Co. Exp. Field (P.D. Wichita), Agr. Exp. Sta. (1976). BS 1964, MS 1971, PhD 1974, Mich. St. Univ.

SCHURLE, BRYAN W., Asst. Prof. of Agricultural Economics; Research Agr. Econ., Farm Management Production, Agr. Exp. Sta. (1977). BS 1972, Emporia St. Univ., MS 1974, PhD 1977, Dhio St. Univ.

SCHWENK, FRED W., Assoc. Prof. of Plant Pathology; Research Soybean Pathologist, Agr. Exp. Sta. (1969, 1974). BS 196D, MS 1964, N.D. St. Univ.; PhD 1969, Univ. of Calif. (GF)

SCHWULST, FRANKLYN J., Asst. Prof.; Meat Animal Research Scientist, Colby Branch Agr. Exp. Sta. (1974). BS 1961, Wisc. St. Univ.; MS 1966, PhD 196B, Univ. of Neb.

SCOVILLE, ORLIN J., Prof. of Agricultural Economics Emeritus (1966, 1976). BS 1931, MS 1933, Colo. St. Univ.; PhD 1949, Harvard Univ.

SEIB, PAUL A., Assoc. Prof. of Grain Science and Industry; Research Biochemist, Agr. Exp. Sta. (197D). BS 1958, PhD 1965, Purdue Univ. (GF)

SHELLENBERGER, JOHN A., Distinguished Univ. Prof. of Grain Science and Industry Emeritus (1944, 1970). BS 192B, Univ. of Wash.; MS 193D, Kan. St. Univ.; PhD 1933, Univ. of Minn.

SHEPARD, JAMES F., Prof., Head of Department of Plant Pathology; Research Plant Pathologist, Agr. Ext. Sta. (1976). BS 1963, Cornell Univ.; MS 1965, PhD 1967, Univ. of Calif. (GF)

SJO, JOHN B., Prof. of Agricultural Economics; Research Agr. Econ., Regional and Community Dev., Agr. Exp. Sta. (1948, 1967). BS 1949, MS 1952, Kan. St. Univ.; PhD 1960, Mich. St. Univ. (GF)

SKIDMORE, EDWARD L., Prof. of Agronomy; Research Soil Physicist, Wind Erosion Lab., U.S.D.A. Agricultural Research Service (1963, 1975). BS 1958, Utah St. Univ.; PhD 1963, Dkla. St. Univ. (Adjunct Appointment) (GF)

SMITH, EDGAR FITZHUGH, Prof. of Animal Sciences and Industry; Beef Cattle Research Scientist and Range Management Research, Agr. Exp. Sta. (1946, 1961). BS 1941, Tex. A & M Col.; MS 1947, Kan. St. Univ.; PhD 1956, Tex. A & M Col. (GF)

SMITH, FLOYD W., Prof., Dir., Agr. Exp. Sta. (1946, 1965). BS 1942, Kan. St. Univ.; MS 1946, PhD 1949, Mich. St. Univ. (GF)

SMITH, ROGER CLETUS, Prof. of Entomology Emeritus (1920, 1958). AB 1911, Miami Univ.; AM 1915, Dhio St. Univ.; PhD 1917, Cornell Univ.

SMITH, WALTER H., Assoc. Prof. of Animal Sciences and Industry; Meat Animal Research Geneticist and Horse Husbandry Research, Agr. Exp. Sta. (194B, 1965). BS 1943, MS 1949, Kan. St. Univ. (GF)

SORENSEN, EDGAR LAVELL, Prof. of Agronomy; Research Alfalfa Geneticist, U.S.D.A., Agricultural Research Service (1955, 197D). BS 1941, MS 1952, Utah Agricultural Col.; PhD 1955, Univ. of Wis. (Adjunct Appointment) (GF)

SORENSON, LEONARD DRLO, Prof. of Agricultural Economics; Research Agr. Econ., Transportation and Marketing, Agr. Exp. Sta. (1955, 196B). BA 1951, MS 1953, PhD 1963, Univ of Minn. (GF)

STAHLMAN, PHILLIP W., Asst. Prof.; Research Agronomist, Fort Hays Branch Agr. Exp Sta (1975, 1976). BS 197D, Panhandle St. Col.; MS 1973, N D. St. Univ

STEGMEIER, WILLIAM D., Assoc. Prof.; Research Agronomist Forage and Specialty Crops, Fort Hays Branch Agr. Exp. Sta. (195B, 1971). BS 1956, MS 1959, Colo. St. Univ.; PhD 1971, S.D. St. Univ.

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STINSON, T. BRUCE, Asst. Prof. Emeritus, Tribune Branch Agr. Exp. Sta (1924, 197D). BS 1924, Kan. St. Univ.

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STUTEVILLE, DONALD L., Assoc. Prof. of Plant Pathology; Research Forage Pathologist, Agr. Exp. Sta. (1964, 1969). BS 1959, MS 1961, Kan. St. Univ., PhD 1964, Univ of Wis. (GF)

SUNDERMAN, HERBERT D., Asst. Prof.; Soils Research Scientist, Colby Branch Agr. Exp Sta (1975). BS 1965, MS 1967, Kan. St. Univ.; PhD 1975, Tex A & M Univ

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THROCKMORTON, RAY IAMS, Dean and Dir. Emeritus, Agriculture (1911, 1952). BS 1911, Pa St. Univ.; MS 1922, Kan. St. Univ

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DAYTON, ARTHUR D., Prof., Head and Dir., Department of Statistics and Dir., Statistical Laboratory, Agr. Exp. Sta. (1966, 1975, 1977). BS 1960, Berea Col.; MS 1964, PhD 1967, Mich. St. Univ. (GF)

OEAN, MARY PAT, Instr. of Speech (1975). BS 1970, MA 1973, Univ. of Ill.

DeCOU, DONALD FRANK, Assoc. Prof. of Economics Emeritus (1947, 1973). BS 1929, Pittsburg St. Univ.; MBA 1934, Northwestern Univ.; 1966, Univ. of Wis. (GF)

DEES, JERDME STEELE, Asst. Prof. of English (1976). BA 195B, Catawba Col.; MA 1961, Fla. St. Univ.; PhD 196B, Univ. of Ill., Urbana. (GF)

DEHON, CLAIRE LOUISE, Asst. Prof. of Modern Languages (1972). BA 1962, Royal Art Institute of Brussels; MA 1964, MA 1969, M.Phil. 1971, PhD 1973, Univ. of Kan. (GF)

DENELL, ROBIN, Assoc. Prof. of Biology (1972, 1977). BA 1965, Univ. of Calif.; MA 196B, PhD 1969, Univ. of Tex. (GF)

OESMARTEAU, OARRYL O., Prof. of Chemistry (1971, 1973, 1977). BS 1963, Wash. St. Univ.; PhD 1966, Univ. of Wash. (GF)

OIXON, LYLE J., Prof. of Mathematics (1963). BS 194B, MS 1950, Dkla. St. Univ.; PhD 1963, Univ. of Kan. (GF)

OOLLAR, OIANE A., Instr. of Art (1976). BS 1955, MA 1967, Kan. St. Univ.

OONNELLY, KARMA, Instr. of English (1977). BA 1962, Univ. of Mich.; MAT 1963, Harvard Univ.

OONNELLY, MICHAEL L., Asst. Prof. of English (1972). AB 1963, Harvard Col.; PhD 197D, Harvard Univ. (GF)

OONOVAN, ROBERT KENT, Asst. Prof. of History (1964). BA 1954, Harvard Univ.; BA 195B, MA 1963, Cambridge Univ.; PhD 1965, Harvard Univ. (GF)

OOUGLAS, LOUIS HARTWELL, Prof. of Political Science Emeritus (1949, 1977). AB 1931, Hastings Col.; MA 1937, PhD 1949, Univ. of Neb. (GF)

ORAGSDORF, R. OEAN, Prof. of Physics (194B, 1956). SB 1944, PhD 194B, Mass. Inst. of Tech. (GF)

DRESSLER, ROBERT E., Assoc. Prof. of Mathematics (1970, 1973). BA 1965, Univ. of Rochester; MS 1966, PhD 1969, Univ. of Dre. (GF)

DRISS, ANN, Instr. of Modern Languages (1967). AB 1952, Washburn Univ.; MS 1966, Emporia St. Univ.

OUSHKIN, LELAH, Asst. Prof. of Sociology (196B). AB 1953, Smith Col.; MS 1956, PhD 1974, Univ. of Pa. (GF)

EADS, JOHN W., Instr. of Biology (1974). BA 1967, MA 1969, Adams St. Col.

EATON, GEORGE R., Dir. of KSU Printing Service; Asst. Prof. of Journalism and Mass Communications (1955). BS 1947, S.D. St. Col.

EBBERTS, GEORGE ORVAL, Asst. Prof. Emeritus (1946, 1956, 1974). BS 1949, MS 1951, Kan. St. Univ.

ECK, JOHN S., Assoc. Prof. of Physics (1969, 1974). BS 1962, PhD 1967, The Johns Hopkins Univ. (GF)

EOWAROS, ROBERT L., Asst. Prof. of Music (1972). BM 1961, MM 1963, Wichita St.; DMA 1972, Univ. of Dre. (GF)

EITNER, WALTER H., Assoc. Prof. of English (1954, 1959). AB 194B, Univ. of Denver; AM 1949, Univ. of Mich.; PhD 1959, Univ. of Denver. (GF)

ELLSWORTH, LOUIS DANIEL, Prof. of Physics (1946, 1954). BS 1937, Case Inst. of Tech.; MS 193B, PhD 1941, Ohio St. Univ. (GF)

EMERSON, M. JARVIN, Prof. of Economics (1962, 1969). BA 1957, Luther Col.; MA 196D, PhD 1963, Univ. of Iowa. (GF)

ENDAL, ANDREW S., Asst. Prof. of Physics (temporary) (1976). BS 1971, Univ. of Rochester; PhD 1974, Univ. of Fla.

EVANS, THOMAS MARION, Prof. of Health, Phys. Ed. and Rec. Emeritus (1942, 1950). BS 1930, Kan. St. Univ.; MS 1942, Univ. of Mich.; PEDir 195B, Ind. Univ. (GF)

EVANS, WILLIAM E., Asst. Prof. of English (1969). BA 1963, Wayne St. Univ.; MA 1965, Univ. of Mich.; PhD 1973, Ohio Univ.

EXDELL, JOHN B., Asst. Prof. of Philosophy (1972). BA 1967, Dickinson Col.; PhD 1973, Univ. of Tex. at Austin. (GF)

FATELEY, WILLIAM G., Prof. and Head of Chemistry Department (1972). AB 1951, Franklin Col.; PhD 1955, Kan. St. Univ. (GF)

FEDDER, NORMAN J., Assoc. Prof. of Speech (197D). BA 1955, Brooklyn Col.; MA 1956, Columbia Univ.; PhD 1962, N.Y. Univ. (GF)

FERGUSON, CLYDE RANOOLPH, Asst. Prof. of History (1960, 1963). BA 1955, Univ. of Dkla.; MA 1957, PhD 1960, Duke Univ. (GF)

FEYERHERM, ARLIN M., Prof. of Statistics; Statistical Consultant, Agr. Exp. Sta. (1953, 1964). BS 1946, Univ. of Minn.; MS 194B, Univ. of Iowa; PhD 1952, Iowa St. Univ. (GF)

FIOLER, ROBERT B., Asst. Prof. of Journalism and Mass Communications (1972, 1977). BA 1963, Cedarville Col.; MA 1967, Central Mo. St. Col.

FINA, LOUIS R., Prof. of Biology; Microbiologist, Agr. Exp. Sta. (1954, 1962). AB 1942, MS 1948, PhD 1950, Univ. of Ill. (GF)

FINNEGAN, MICHAEL, Assoc. Prof. of Anthropology (1973, 1977). BA 1967, MA 1970, PhD 1972, Univ. of Colo. (GF)

FIRLING, JANICE D., Instr. of Speech (1974). BS 1967, MA 1970, Kan. St. Univ.

FISHER, PAUL S., Assoc. Prof. and Head of Computer Science (1967, 1973). BA 1963, MA 1964, Univ. of Utah; PhD 1969, Ariz. St. Univ. (GF)

FLANAGAN, BRUCE, Prof. of Speech (1966). BS 1953, Western Mich. Univ.; MS 195B, Southern Ill. Univ.; PhD 1966, Univ. of Fla. (GF)

FLORA, CORNELIA BUTLER, Assoc. Prof. of Sociology; Rural Sociologist, Agr. Exp. Sta. (1970). BA 1965, Univ. of Calif.; MS 1966, PhD 1970, Cornell Univ. (GF)

FLORA, JAN L., Asst. Prof. of Sociology; Rural Sociologist, Agr. Exp. Sta. (1970). BA 1964, Univ. of Kan.; MS 1967, PhD 1971, Cornell Univ. (GF)

FLOUER, JACK, Assoc. Prof. of Music (1971). BME 1960, Marshall Univ.; MM 1962, Eastman School of Music; DM 1971, Ind. Univ. (GF)

FOLLAND, NATHAN D., Assoc. Prof. of Physics (1966, 1972). BA 1959, Concordia Col.; PhD 1965, Iowa St. Univ. (GF)

FRAHM, ROBERT L., Adjunct Clinical Instr. of Med. Tech. (1976). BM 195B, Bethany Col.

FRETWELL, STEPHEN D., Asst. Prof. of Biology (1969). BS 1964, Bucknell Univ.; PhD 196B. N.C. St. Univ. (GF)

FREY, MARSHA L., Asst. Prof. of History (1973). BA and BSc in Educ. 1967, MA 196B, PhD 1971. Ohio St. Univ. (GF)

FRIEDMANN, EUGENE ALVIN, Prof., Head of Department of Sociology and Anthropology (1965). AB 1947, MA 1949, PhD 1953, Univ. of Chicago (GF)

FRIEMAN, JEROME, Assoc. Prof. of Psychology (196B, 1974). BA 1963, MS 1965, Western Reserve Univ.; PhD 1969, Kent St. Univ. (GF)

FRY, ROBERT, Asst. Prof. of Chemistry (1977). BS 1971, Univ. of Ill.; PhD 1977, Univ. of Ariz. (GF)

FRYER, HOLLY CLAIRE, Prof.; Department of Statistics; Consultant, Agr. Exp. Sta. (1940, 1946, 1959). BS 1931, Univ. of Dre.; MS 1933, Dre. St. Univ.; PhD 1940, Iowa St. Univ. (GF)

FULLER, LEONARD EUGENE, Prof. of Mathematics (1952, 1959). BS 1941, Univ. of Wyo.; MS 1947, PhD 1950, Univ. of Wis. (GF)

FUNKHOUSER, SARA, Instr. of Music (1976). BM 1974, MM 1975, Univ. of Mo., Kansas City.

GALLAGHER, TOM L., Dir., Computing Center, Assoc. Prof. of Computer Science (1970). BA 1953, MS 1954, North Tex. St. Col.; DSc 1967, Wash. Univ. (GF)

GARDNER, RAYMOND KEITH, Res. Assoc. Physics (1977). BS 1971, MS 1973, East Tex. St.; PhD 1977, North Tex. St.

GARZIO, ANGELO C., Prof. of Art (1957, 1966). BA 1949, BS 1949, Syracuse Univ.; Diploma di Profitto, 1950, Univ. of Florence, Italy, MA 1954, MFA 1955, St. Univ. of Iowa (GF)

GEISSLER, WINNIFRED J., Asst. Prof. of English (1954, 1977). B Music Ed 1940, Bethany Col.; MS 1954, PhD 1976, Kan. St. Univ.

GENCH, BARBARA E., Asst. Prof. of Health, Phys. Ed. and Rec. (196B, 1970). BS 1963, MS 1967, Kan. St. Univ.; EdD 1974, Univ. of Northern Colo. (GF)

GEYER, KATHERINE, Prof. of Health, Phys. Ed. and Rec. Emerita (1927, 1945, 1974). BS 1927, Ohio St. Univ.; MA 1934, Columbia Univ. (GF)

GIER, HERSCHEL THOMAS, Prof. of Biology Emeritus, Embryologist, Agr. Exp. Sta. (1947, 1960). AB 1931, Pittsburg St. Univ.; PhD 1936, Ind. Univ. (GF)

GILLESPIE, VINCENT E., Asst. Prof. of English (1966). BA 1952, Sterling Col.; MA 1956, PhD 1970, Univ. of Kan.

GIVEN, KINGSLEY WALTON, Prof. of Speech Emeritus (192D, 1950). BS 1926, Park Col.; MA 1929, St. Univ. of Iowa (GF)

GLENN, ESTHER BEACHEL, Asst. Prof. of English Emerita (194B, 1954). AB 1930, Kan. Wesleyan Univ., MS 193B, Kan. St. Univ. (GF)

GOACHER, STEPHEN K., Instr. of Music (1977). BA 196B, UCLA, MM 1970, TCU.

GODDRICH, ARTHUR LEONARD, Prof. of Biology Emeritus (1929, 1970). BS 192B, Col. of Idaho; MS 1929, Univ. of Idaho; PhD 193B, Cornell Univ. (GF)

GORMELY, PATRICK JOSEPH, Assoc. Prof. (1967, 1975). AB 1963, Catholic Univ. of America, PhD 1967, Duke Univ. (GF)

GRAF, WILLIAM G., Instr. of Journalism and Mass Communications (1976). BA 1966, Mich. St. Univ., MS 1973, Syracuse.

GRANROSE, CHERLYN S., Instr. of Biology (1974). BS 1964, MS 1966, Univ. of Mich.

GRAY, MARION WILSON, JR., Asst. Prof. of History (1969). BA 1964, Tex. Christian Univ.; MA 1966, PhD 1971, Univ. of Wis. (GF)

GRAY, THOMAS F., Asst. Prof. of Speech (1974). BA 1962, MA 1967, Univ. of Northern Iowa, PhD 1975, Univ. of Minn.

GRAY, TOM J., Prof. of Physics (1977). BS 196D, MS 1962, North Tex. St. Univ.; PhD 1967, Fla. St. Univ.

GREECHIE, RICHARD J., Prof. of Mathematics (1967, 1970, 1977). BS 1962, Boston Col.; PhD 1966, Univ. of Fla. (GF)

GRENIER, LEON E., Assoc. Prof. of Aerospace Studies (1977). BA 1966, MA 1973, Univ. of Okla.

GRIFFITT, WILLIAM B., Prof. of Psychology (196B, 1975). BA 1964, Kan. St. Univ.; PhD 1967, Univ. of Tex. (GF)

GRINDELL, ROBERT M., Assoc. Prof. of English (1972, 1977). AB 1956, Harvard Univ.; MA 1964, N.Y. Univ.; PhD 1972, Univ. of Ariz. (GF)

GROSH, DORIS L., Assoc. Prof. of Industrial Engineering; Joint Appt. with Department of Statistics (1965, 196B). BS 1946, Univ. of Chicago; MS 1949, PhD 1969, Kan. St. Univ. (GF)

GUSTAFSON, DAVID A., Instr. of Computer Science (1977). BS 1969, Univ. of Utah; MS 1973, PhD 1977, Univ. of Wis.

GUSTAFSON, MERLIN DeWAYNE, Assoc. Prof. of Political Science (196D, 196B). BS 1943, MS 1947, Kan. St. Univ.; PhD 1956, Univ. of Neb. (GF)

HACKER, DAVID W., Visiting Prof. (temporary) of Journalism and Mass Communications (1977). AB 1952, Hanover Col.

HAGAN, PATRICIA W., Asst. Instr. of Art (1971). BS 197D, Kan. St. Univ.

HAGGART, EDMOND O., Asst. Prof. of Economics (1973). BA 1967, Kan. Univ.; PhD 1973, Univ. of Minn.

HAJDA, JOSEPH, Dir. of International Activities (1965); Assoc. Prof. of Political Science (1957, 1960). BA 1951, MA 1952, Miami Univ.; MA, PhD 1955, Ind. Univ. (GF)

HAMILTON, JAMES R. Asst. Prof. of Philosophy (1971). BA 1964, Pfeiffer Col.; MA 1967, Emory Univ.; MDiv 196B, Union Theological Seminary; PhD 1974, Univ. of Tex. at Austin. (GF)

HAMLIN-SCHENCK, WILLIAM J., Asst. Prof. of Speech, BS 1969, MA 1971, Kan. St. Univ.; PhD 1976, Univ. of Ore. (GF)

HAMMAKER, ROBERT M., Prof. of Chemistry (1961, 1974). BS 1956, Trinity Col.; PhD 1960, Northwestern Univ. (GF)

HAMSCHER, ALBERT N., III, Assoc. Prof. of History (1972, 1973, 1977). BA 196B, Pa. St. Univ.; MA 197D, PhD 1973, Emory Univ. (GF)

HANKLEY, WILLIAM JOHN, Assoc. Prof. of Computer Science (1972). BSEE 1962, MS 1964, Northwestern Univ.; PhD 1967, Ohio St. Univ. (GF)

HANSEN, MERLE FREDRICK, Prof. and Assoc. Dir. of Biology; Parasitologist, Agr. Exp. Sta. (195D, 1963). AB 1939, MA 1941, Univ. of Minn.; PhD 194B, Univ. of Neb. (GF)

HARRIS, OSCAR L., Instr. of Aerospace Studies (1977).

HARRIS, RICHARD J., Asst. Prof. of Psychology (1974). BA 1968, Col. of Wooster; MA 1971, PhD 1974, Univ. of Ill. (GF)

HARRIS, T. ROBERT, Asst. Prof. of Sociology and Anthropology (1973). BA 1965, Reed Col.; PhD 1972, The Johns Hopkins Univ. (GF)

HARRIS, VIDA AGNES, Assoc. Prof. of Art Emerita (1924, 1963). BS 1914, Kan. St. Univ.; AM 1927, Univ. of Chicago. (GF)

HARRISS, STELLA, Asst. Prof. of Chemistry Emeritus (1919, 1953). BS 1917, MS 1919, Kan. St. Univ.

HASZA, DAVID, Asst. Prof. of Statistics (1977). BS 1972, Purdue; MS 1974, Drake; PhD 1977, Iowa St. Univ.

HATHAWAY, CHARLES, Prof. and Head of Physics (1964, 1969, 1975). BS 195B, Tex. A & M Col., PhD 1964, Univ. of Okla. (GF)

HAWES, JOSEPH M., Assoc. Prof. and Head of History (1971, 1973, 1977). BA 1960, Rice Univ.; MA 1962, Okla. St. Univ.; PhD 1969, Univ. of Tex. at Austin. (GF)

HAWLEY, M. DALE, Prof. of Chemistry (1966, 1970, 1976). BA 1960, MA 1962, Univ. of Northern Iowa; PhD 1965, Univ. of Kan. (GF)

HEDGCOTH, CHARLIE, JR., Prof. of Biochemistry; Biochemist, Agr. Exp. Sta. (1965, 1976). BS 1961, PhD 1965, Univ. of Tex. (GF)

HEDRICK, DONALD K., Asst. Prof. of English (1976). BA 1969, Univ. of Kan.; MA 1972, PhD 1974, Cornell Univ.

HERMAN, LOUIS M., Asst. Prof. of Mathematics (1970). BS 1963, MS 1965, Univ. of Fla.; PhD 1970, Univ. of Mass. (GF)

HESS, JAMES L., Asst. Prof. of Statistics (1977). BS 1973, Univ. of Mo., Rolla; MS 1975, PhD 1977, Southern Meth.

HEWETT, PHILLIP W., Asst. Prof. of Music (1969, 1971). BME 1959, Tex. Christian Univ.; MS 1970, Kan. St. Univ.

HIGGINSON, FRED H., Prof. of English (1950, 1969). AB 1942, MA 1947, Univ. of Wichita; PhD 1953, Univ. of Minn. (GF)

HIGHAM, BARBARA C., Instr. in Economics (1974). BA 194B, Mt. Holyoke; MA 1950, Columbia Univ.

HIGHAM, ROBIN, Prof. of History (1963, 1966). AB 1950, Harvard Col.; MA 1953, Claremont Grad. School; PhD 1957, Harvard Univ. (GF)

HILL, DENZEL W., Instr. of Economics (1977). BS 1975, Kearney St. Col.; MS 1977, Okla. St. Univ.

HILL, OPAL BROWN, Assoc. Prof. of Art Emerita (1944, 1954). BS 1944, MS 1950, Kan. St. Univ. (GF)

HILL, RANDALL CONRAD, Prof. of Sociology Emeritus (1929, 1970). BS 1924, MS 1927, Kan. St. Univ.; PhD 1929, Univ. of Mo. (GF)

HINRICHS, CARL, Asst. Prof. of Speech (1964). AB 1959, MA 196D, Univ. of N.C. (GF)

HOLT, DONALD N., Assoc. Prof. of Journalism and Mass Communications (1974). BA 1950, Univ. of Colo.; MS 1970, Univ. of Wis.

HOOK, PATRICIA W., Instr. of Biology (1970). BA 1963, MS 1965, Kan. St. Univ.; PhD 1970, Ore. St. Univ.

HOSTETTER, HELEN PANSY, Prof. of Journalism Emerita (1926, 1964). AB 1917, Univ. of Neb.; BS 1940, Kan. St. Univ.; MS 1926, Northwestern Univ. (GF)

HOUSER, DAVID J., Asst. Prof. of English (1969). BS 1964, Iowa St. Univ.; MS 1966, PhD 197D, Univ. of Wis. (GF)

HSU, CHEN-JUNG, Prof. of Mathematics (1965). BS 1941, DS 1961, Tohoku Univ., Japan. (GF)

HULBERT, LLOYD C., Prof. of Biology; Ecologist, Agr. Exp. Sta. (1955, 1972). BS 194D, Mich. St. Univ.; PhD 1953, Wash. St. Univ. (GF)

IANDOLO, JOHN J., Assoc. Prof. of Biology; Microbiologist, Agr. Exp. Sta. (1967, 1973). BS 1961, Loyola Univ., Chicago; MS 1963, PhD 1965, Univ. of Ill. (GF)

ILES, IVOR VICTOR, Prof. of Political Science Emeritus (1911, 1949). BA 19D4, MA 1905, Univ. of Kan. (GF)

IYENGAR, SHANTO, Assoc. Prof. of Political Science (1972, 1977). BA 1966, Osmania Univ.; MA 196B, PhD 1972, Univ. of Iowa. (GF)

JACK, HULAN E., JR., Asst. Prof. of Physics (1971). BS 1960, MS 1964, PhD 1971, N.Y. Univ. (GF)

JACKSON, JACQUELINE M., Asst. Prof. of Social Work. BA 1967, St. Augustine; MASW 1970, Univ. of Chicago.

JACKSON, T. HANLEY, Assoc. Prof. of Music (196B, 1975). BA 1965, San Fernando Valley St. Col.; MA 196B, Calif. St. Col. at Long Beach. (GF)

JACOBS, DAVID S., Adjunct Clinical Associate of Med. Tech. (1976). BS 1953, MD 1956, Univ. of Mich.

JANES, WILLIAM CHARLES, Assoc. Prof. of Mathematics Emeritus (1922, 1968). BS 1919, Northwestern Univ.; MA 1922, Univ. of Neb.

JOHNSON, DALLAS E., Assoc. Prof. of Statistics; Consultant, Agr. Exp. Sta. (1975). BS 1960, Kearney St. Col.; MA 1966, Western Mich. Univ.; PhD 197D, Colo. St. Univ. (GF)

JOHNSON, GEORGE DANA, Assoc. Prof. of Chemistry (1952, 1967). AB 1940, MA 1941, Oberlin Col.; PhD 1946, Univ. of Mich. (GF)

JOHNSON, MICHAEL P., Assoc. Prof. of Biology (1972). BS 1959, Univ. of Calif.; PhD 1966, Univ. of Dre. (GF)

JOHNSON, ROBERT E., Assoc. Prof. of Health, Phys. Ed. and Rec. (1977). BA 1951, Transylvania Univ.; MA 1969, Georgetown Univ.; PhD, Ohio Univ. (GF)

JOHNSON, TERRY C., Prof. and Dir. of Biology, Agr. Exp. Sta. (1977). BS 195B, Hamline Univ.; MS 1961, PhD 1964, Univ. of Minn.; (GF)

JOHNSON, THOMAS, Asst. Prof. of Chemistry (1977). BA 1969, PhD 1977, Univ. of Minn. (GF)

JOHNSTON, KENNETH GORDON, Assoc. Prof. of English (1966, 1972). BA 194B, Univ. of Calif. at Berkeley; MA 1951, Univ. of Calif. at Los Angeles; PhD 1966, Univ. of Minn. (GF)

JONES, DALE VINCENT, Assoc. Prof. of English Emeritus (1946, 1951). BS 1931, MS 1941, Kan. St. Univ. (GF)

JONES, JOHN A., Asst. Prof. of Military Science (1976). BS 1968, US Military Acad.

JONES, KENNETH W., Prof. of History (1965, 197D, 1976). AB 1958, MA 1959, PhD 1966, Univ. of Calif. (GF)

KAISER, MARVIN, Instr. in Social Work (1977). BA 1961, Cardinal Glennon Col.; MA 1963, Kan. St. Univ.; MSW 1977, Univ. of Kan.

KAMMER, ANN E., Assoc. Prof. of Biology; Neural Biologist (1972). BS 1956, N.Y. St. Col. for Teachers; MS 195B, Univ. of N.H., Durham; PhD 1966, Univ. of Calif., Berkeley. (GF)

KAUFMAN, BURTON I., Prof. of History (1973, 1977). BA 1962, Brandeis Univ.; MA 1964, PhD 1966, Rice Univ. (GF)

KAY, KENNETH G., Assoc. Prof. of Chemistry (1971, 1974). BS 1965, MS 1965, Polytechnic Inst. of Brooklyn, PhD 1970, The Johns Hopkins Univ. (GF)

KEISER, GEORGE R., Assoc. Prof. of English (1973, 1975). BA 1962, MA 1964, PhD 1971, Lehigh Univ. (GF)

KELLEY, JOHN R., JR., Assoc. Prof. of Biology, Agr. Exp. Sta. (1975). BS 1963, La. Tech. Univ.; MS 1965, La. St. Univ.; PhD 1969, Auburn Univ. (GF)

KEMP, KENNETH E., Assoc. Prof. of Statistics; Consultant, Agr. Exp. Sta. (1968). BS 1963, MS 1965, PhD 1967, Mich. St. Univ. (GF)

KENNEDY, THOMAS E., Asst. Prof. of Economics (1973, 1975). BA 1969, Univ. of Calif., Santa Barbara; MA 1974, PhD 1975, The Johns Hopkins Univ. (GF)

KEPLER, JON S., Adjunct Prof. of History, Marymount College (1977). BA 1962, MA 1966, Univ. of Tulsa; PhD 1972, Univ. of Kan.

KIPP, JACOB W., Assoc. Prof. of History (1971, 1975). BS 1964, Shippensburg St. Col.; MA 1967, PhD 1970, Pa. St. Univ. (GF)

KIRKENDALL, DON R., Prof. and Head of Health, Phys. Ed. and Recreation (1976). BS 1963, MS 1965, PhD 196B, Purdue Univ. (GF)

KLAASSEN, HAROLD E., Assoc. Prof. of Biology, Agr. Exp. Sta. (1967, 1976). AB 1957, Tabor Col.; MS 1959, Kan. St. Univ.; PhD 1967, Univ. of Wash. (GF)

KLOPFENSTEIN, WILLIAM E., Assoc. Prof. of Biochemistry; Assoc. Biochemist, Agr. Exp. Sta. (1964, 1972). BS 1958, MS 1961, PhD 1964, Pa. St. Univ. (GF)

KOCH, WILLIAM E., Assoc. Prof. of English (1946, 1947, 1973). BS 193B, N.D. St. Teachers Col.; MS 1949, Kan. St. Univ. (GF)

KOLONOSKY, WALTER F., Asst. Prof. of Modern Languages (1973). BA 1963, Lycoming Col.; MA 1965, Univ. of Pa.; PhD 1972, Univ. of Kan. (GF)

KRAMER, CHARLES LAWRENCE, Prof. of Biology; Mycologist, Agr. Exp. Sta.; Adjunct Prof. of Plant Pathology (1958, 1966). AB 1950, MA 1953, PhD 1957, Univ. of Kan. (GF)

KRAMER, KARL J., Asst. Prof. of Biochemistry; Research Chemist, Grain Marketing Research Center (1973). BS 1964, Purdue Univ.; PhD 1971, Univ. of Ariz. (Adjunct Appointment) (GF)

KREN, GEORGE M., Prof. of History (1965, 1976). BA 1948, Colby Col.; MA 1949, PhD 1960, Univ. of Wis. (GF)

KREN, MARGARETTA H., Instr. of Art (1976). BS 1966, Univ. of Wis.; MA 1969, Kan. St. Univ.

KROMM, DAVID, Prof. of Geography (1967, 1971, 1977). BS 1960, Eastern Mich. Univ.; MA 1964, PhD 1967, Mich. St. Univ. (GF)

KURONEN, DENNIS W., Asst. Prof. of Art (1977). BFA 1969, Univ. of S.D.; MFA 1973, Univ. of Neb.

LACHER, JOHANNES, Asst. Prof. of Art (1977). Certificate 1969, Fine Arts Acad. of Munich; MFA 1970, Univ. of Ga.

LAMAN, RUSSELL, Asst. Prof. of English Emeritus (1935, 1972). BS 1932, Kan. St. Univ.; MA 1933, St. Univ. of Iowa. (GF)

LAMBERT, JACK L., Assoc. Head and Prof. of Chemistry (1950, 1958). AB 1947, MS 1947, Pittsburg St. Univ.; PhD 1950, Okla. St. Univ. (GF)

LANGENKAMP, JERRY REESE, Assoc. of Prof. of Music (1970). BM 1953, Univ. of Okla., MM 195B, DMA 1970, Univ. of Mich. (GF)

LANGFORD, ROY CLINTON, Prof. of Psychology Emeritus (1925, 1941). BS 1925, MS 1926, Kan. St. Univ.; PhD 1934, Leland Stanford Jr. Univ. (GF)

LANNING, FRANCIS C., Assoc. Prof. of Chemistry (1942, 1961). BS 1930, MS 1931, Univ. of Denver; PhD 1936, Univ. of Minn. (GF)

LARMER, OSCAR VANCE, Prof. of Art (1950, 1970). BFA 1949, Univ. of Kan.; MFA 1955, Wichita Univ. (GF)

LASH, MENDEL ELMER, Prof. of Chemistry Emeritus (1922, 1966). AB 1920, MS 1922, PhD 1928, Ohio St. Univ. (GF)

LASHBROOK, RALPH RICHARD, Prof. and Head Emeritus, Department of Journalism (1934, 1944). BS 1929, Kan. St. Univ.; MS 1942, Univ. of Wis. (GF)

LAURIE, DAVID R., Asst. Prof. of Health, Phys. Ed. and Rec. (196B). BS 1963, MS 1966, Kan. St. Univ.; EdD 1974, Okla. St. Univ. (GF)

LEAVENGOOD, LUTHER OMAR, Prof. of Music Emeritus (1945, 1975). BM 1929, Univ. of Kan.; MM 1936, Univ. of Mich. (GF)

LEE, RONALD S., Assoc. Prof. of Physics (1967, 1974). BA 1961, Luther Col.; PhD 1967, Iowa St. Univ. (GF)

LEE, YU-LEE, Prof. of Mathematics (1967, 1975). BS 1955, MA 1959, National Taiwan Univ.; PhD 1964, Univ. of Ore. (GF)

LEGG, JAMES C. Prof. of Physics and Dir., Nuclear Science Lab. (1967, 1973). BS 195B, Ind Univ.; MA 1960, PhD 1962, Princeton Univ. (GF)

LENHERT, ANNE G., Asst. Prof. of Chemistry (1967). BA 195B, Hollins Col.; MS 1963, PhD 1965, The Univ. of N.M. (GF)

LILLEY, JOHN M., Asst. Dean and Assoc. Prof., Music (1976). BME 1961, BM 1962, MM 1964, Baylor; DMA 1971, Univ. of So. Calif. (GF)

LIMPER, LOUIS HENRY, Prof. of Modern Languages Emeritus (1914, 1944). AB 1907, Baldwin-Wallace Col.; AM 1914, Univ. of Wis.; PhD 1931, St. Univ. of Iowa. (GF)

LIN, CHI-DONG, Asst. Prof. of Physics (1976). BA 1969, Natl. Taiwan Univ.; MS 1970, PhD 1974, Univ. of Chicago.

LINDER, ROBERT D., Prof. of History (1965, 1973). BS 1956, Emporia St. Univ.; MDiv, MRE 195B, Central Baptist Theological Seminary; MA 1960, PhD 1963, Univ. of Iowa. (GF)

LINOLEY, DONALD O., Assoc. Prof. of Health, Phys. Ed. and Rec. (1973). BA 1949, Wichita St. Univ.; MEd 1952, Univ. of Minn.; DEd 1970, Univ. of Ore. (GF)

LINFORD, ORMA, Asst. Prof. of Political Science (1966). BS 1956, Utah St. Univ.; MS 1958, PhD 1964, Univ. of Wis. (GF)

LOCKHART, CHARLES HOWARD, Assoc. Prof. of Biology Emeritus (1940, 1947, 1972). BS 1934, MS 193B, Kan. St. Univ. (GF)

LOGAN, JOHN O., Assoc. Prof. of Mathematics (1973). BS 1966, MS 196B, PhD 1970, Ohio St. Univ. (GF)

LONG, GLENN WESLEY, Asst. Prof. of Sociology Emeritus (193B, 1970). AB 1926, Baker Univ.; MS 1940, Kan. St. Univ. (GF)

LONGHURST, THOMAS M., Assoc. Prof. of Speech (1971, 1975). BS 1966, MS 196B, PhD 1970, Univ. of Minn. (GF)

LOSS, RICHARD J., Asst. Prof. of Political Science (1977). BA 1960, MA 1962, Penn. St. Univ.; MA 1965, Univ. of Chicago; PhD 1971, Cornell Univ.

LOVE, JUDITH, Asst. Prof. of Art (1970, 1973). A of A 1961, Cottey Col.; BFA 1964, Kansas City Art Inst.; MFA 1969, Univ. of Neb.

LOWER, CONSTANCE E., Adjunct Clinical Instr. of Med. Tech. (1976). BS 194B, Kan. St. Univ.

LYNN, NAOMI B., Assoc. Prof. of Political Science (1970, 1975). BA 1954, Maryville Col.; MA 195B, Univ. of Ill.; PhD 1970, Univ. of Kan. (GF)

MACDONALD, JAMES ROBERT, Prof. of Physics (196B, 1975). BA 195B, Univ. of Toronto; MS 1964, PhD 1966, McMaster Univ. (GF)

MACFARLAND, DAVID T., Asst. Prof. of Journalism and Mass Comm. (1972). BA 1965, MA 1966, Stetson Univ.; PhD 1972, Univ. of Wis. (GF)

MADDOX, JERROLD, Prof. and Head of Art (1974). BS 1954, MFA 1959, Ind. Univ. (GF)

MAHLER, RONNIE J., Asst. Prof. of Health, Phys. Ed. and Rec. (1974). Ballet Russe de Monte Carlo 1960-62, National Ballet 1963-67, American Ballet Theatre 1969-72.

MANNEY, THOMAS R., Prof. of Physics (1971, 1977). BA 195B, Western Wash. St. Col.; PhD 1964, Univ. of Calif. (GF)

MARCHIN, GEORGE L., Prof. of Biology, Agr. Exp. Sta. (1970, 1975). BA 1962, Rockhurst Col.; PhD 1967, Univ. of Kan. (GF)

MARIAMPOLSKI, HYMAN, Asst. Prof. of Sociology, (1976, 1977). BA 196B, City Univ. of N.Y.; MS 1971, PhD 1977, Purdue Univ. (GF)

MARKS, GRAHAM, Asst. Prof. of Art (1976). BFA 1976, Philadelphia Col. of Art; MFA 1976, Alfred Univ. (GF)

MARR, JOHN MAURICE, Prof. of Mathematics (1953, 195B, 1962). BS 1941, Central Mo. St. Col.; MA 1948, Univ. of Mo.; PhD 1953, Univ. of Tenn. (GF)

MARTIN, SISTER MARY LENORE, Adjunct Prof. of History, (Saint Mary College) (1977). BA 1947, MS 195B, St. Mary Col.; MA 1966, St. Louis Univ.

MARYANSKI, FRED, Asst. Prof. of Computer Science (1974). BS 196B, Providence Col.; MS 1972, Stevens Inst. of Tech.; PhD 1974, Univ. of Conn. (GF)

MARYMOUNT, JESSE H., Adjunct Clinical Associate of Med. Tech. (1976). BS 1950, Syracuse Univ., MD 1954, St. Univ. of N.Y. at Syracuse

MARZOLF, G. RICHARD, Prof. of Biology, Agr. Exp. Sta. (1962, 1973, 1975). AB 1957, Wittenberg Univ.; PhD 1962, Univ. of Mich. (GF)

MATHERNE, BEVERLY M., Asst. Prof. of English (1975). BA 1969, MA 1971, Univ. of Southwestern La.; PhD 1974, St. Louis Univ. (GF)

MATTHEWS, KAREN A., Asst. Prof. of Psychology (1976). BA 196B, Univ. of Calif., Berkeley; MA 1971, Calif. St. Univ., San Jose; PhD 1976, Univ. of Tex. (GF)

MAXFIELD, JOHN E., Prof. and Head of Department of Mathematics (1967). BS 1947, Mass. Inst. of Tech.; MS 1949, Univ. of Wis.; PhD 1951, Univ. of Ore. (GF)

MAXWELL, GEORGE WILLARD, Asst. Prof. of Physics Emeritus (1927, 1960). AB 1912, MS 1920, Univ. of Mich.

McCARTHY, PAUL E., Prof. of English (1967, 1975). BA 194B, MFA 1951, St. Univ. of Iowa; PhD 1962, Univ. of Tex. (GF)

McCRACKEN, ELIZABETH UNGER, Assoc. Prof. of Biology Emerita (1938, 1970). AB 1929, MA 1932, Wellesley Col.; PhD 1937, Univ of Calif. (GF)

McCULLOH, JOHN M., Assoc. Prof. of History (1973, 1976). BA 1965, Kan. Univ.; MA 1966, PhD 1971, Univ. of Calif., Berkeley. (GF)

McDONALD, RICHARD N., Prof. of Chemistry (1960, 196B). BS 1954, MS 1955, Wayne St. Univ.; PhD 1957, Univ. of Wash. (GF)

McGHEE, RICHARD D., Assoc. Prof. and Head of English (1967, 1971, 1974). BA 1962, Univ. of Mo. at KC; MA 1964, PhD 1967, Univ. of Okla. (GF)

McGRAW, BETTY R., Asst. Prof. of Modern Languages (1963, 1970). Licence es Lettres 1961, Universite de Paris

McGUIRE, JAMES H., Assoc. Prof. of Physics (1972, 1975). BS 1964, Rensselaer Polytechnic Inst.; MS 1966, PhD 1969, Northeastern Univ. (GF)

McKENNA, SISTER JEANNE, Adjunct Prof. of History, (Marymount College) (1977). BA 1954, Loretto Heights Col.; PhD 196B, St. Louis Univ.

McKINNEY, KATHERYN ANN, Assoc. Prof. of Health, Phys. Ed. and Rec. Emeritus (1946, 1972). BS 1934, Kan. St. Univ.; MA 1935, George Peabody Col. for Teachers. (GF)

McNEILL, EVAN J., Asst. Prof. of Military Science (1977). BBA 1968, Marshall Univ.

McSWEGIN, PATRICIA J., Asst. Prof. of Health, Phys. Ed. and Rec. (1977). BA 196F, Ill. St.; MS 1972, Northern Ill.; PhD 1976, Kent St.

MEADE, JAMES H., Research Assoc. of Physics (1974). BS 1969, St. Anselm's Col.; MS 1974, PhD 1975, Univ. of Tex. at Dallas.

MELOAN, CLIFTON E., Prof. of Chemistry (1959, 196B). BS 1953, Iowa St. Univ.; PhD 1959, Purdue Univ. (GF)

MENDENHALL, BURNEY L., Asst. Prof. of Modern Languages (1965). BA 1950, Washburn Univ.; MS 1953, Emporia St. Univ.; PhD 1964, Univ. of Kan. (GF)

MILEY, JAMES D., Asst. Prof. of Sociology (1970). BA 1959, Millsaps Col.; MA 1963, La. St. Univ.; PhD 1970, Tulane Univ. (GF)

MILLER, CARDL LYNN, Asst. Prof. of Modern Languages (196B). BA 195B, MA 1959, Vanderbilt Univ.; PhD 1963, Washington Univ. (GF)

MILLER, CECIL H., Prof. of Philosophy Emeritus (1945, 1972). AB 1930, Univ. of Kan.; MA 1939, Univ. of Calif. (GF)

MILLER, FORREST R., Assoc. Prof. of Mathematics (196B, 1975). BS 1962, Univ. of Okla.; MA 1965, PhD 196B, Univ. of Mass. (GF)

MILLER, MICHAEL H., Assoc. Dir. Computing Center; Asst. Prof. of Computer Science, (1960, 1964, 1971). BS 1958, MS 1960, Iowa St. Univ.

MILLERET, MIRIAM H., Instr., Dean, Arts and Sciences office (1967). BS 1947, Kan. St. Univ.

MILLIKEN, GEORGE A., Assoc. Prof. of Statistics; Consultant, Agr. Exp. Sta (1969). BS 1965, MS 196B, PhD 1969, Colo. St. Univ. (GF)

MITCHELL, HOWARD LEE, Prof. of Biochemistry; Biochemist, Agr. Exp. Sta. (1946, 1961). BS 193B, Okla. St. Univ.; PhD 1946, Purdue Univ. (GF)

MITCHELL, JAMES C., Prof. of Psychology (1966, 1974). BS 1957, MA 1959, PhD 1962, Ohio St. Univ. (GF)

MOLINEUX, BARRY R., Instr. of Speech (1970). BS 1966, MA 196B, Kan. St. Univ.

MOORE, FRITZ, Prof. of Modern Languages Emeritus (1934, 1971). AB 1927, Univ. of Akron; MA 1930, PhD 1932, Univ. of Ill. (GF)

MORRIS, JIM R., Assoc. Prof. of Journalism and Mass Communications (196B). AA 1957, Kilgore Col.; BJourn. 1959, Univ. of Tex.; MA 1964, Univ. of Ga.; EdD 1969, North Tex. St. Univ. (GF)

MOSER, HERBERT CHARLES, Prof. of Chemistry (1957, 1967). BA 1952, San Jose St. Col., PhD 1957, Iowa St. Univ. (GF)

MOSES, WILLIAM R., Prof. of English (1950, 1954). BA 1932, MA 1933, PhD 1939, Vanderbilt Univ. (GF)

MOSSMAN, THIRZA ADELINE, Assoc. Prof. of Mathematics Emerita (1922, 1965). BA 1916, Univ. of Neb.; MA 1922, Univ. of Chicago. (GF)

MROZEK, DONALD J., Asst. Prof. of History (1972, 1973). BA 1966, Georgetown Univ.; MA 196B, PhD 1972, Rutgers Univ. (GF)

MUELLER, DELBERT D., Assoc. Prof. of Biochemistry; Assoc. Biochemist, Agr. Exp. Sta. (196B, 1975). BS 1962, PhD 1966, Univ. of Okla. (GF)

MUENZENBERGER, TOM B., Asst Prof. of Mathematics (1976). BS 1965, MS 1967, Univ. of Fla . PhD 1972, Univ of Wyo

MUNCE, JAMES C., Asst. Prof. of Art (1972). BFA 1966, Minneapolis School of Art; MFA 1971, Ind Univ (GF)

MUNRO, DONALD FARNHAM, Assoc Prof. of Modern Languages Emeritus (194D). BS 1926, MA 1927, Acadia Univ . Canada; PhD 1933, Univ of Ill. (GF)

MURPHY, DOUGLAS G., Asst Prof. of Biology (1976). AB 1967, Univ. of Rochester; MS 1969, Syracuse Univ ; PhD 1975, Univ of Penn. (GF)

NAFZIGER, ESTEL WAYNE, Assoc Prof. of Economics (1966, 1973). BA 196D, Goshen Col.; MA 1962, Univ of Mich.. PhD 1967, Univ. of Ill. (GF)

NASSAR, RAJA F., Prof. of Statistics; Consultant, Agr. Exp Sta. (1966, 196B). BS 195B, American Univ . Beiruf, Lebanon, MS 1960, Univ. of Idaho; PhD 1963, Univ of Calif., Davis (GF)

NEUMEYER, DAVID P., Asst. Prof of Music (1976). BM 1972, Mich. St. Univ.. MPhil 1975; PhD 1976, Yale Univ (GF)

NEWCOMB, MARGARET ALICE, Assoc. Prof. of Biology Emerita (1925, 197D). BS 1925, MS 1927, Kan. St. Univ. (GF)

NICHOLS, HAROLD J., Assoc. Prof. of Speech (1971, 1975). BS 1967, Iowa St. Univ.; MA 1969, PhD 1971, Ind St. Univ. (GF)

NIEMAN, DONALD G., Asst. Prof. of History (1974, 1975). BA 197D, Drake Univ.; PhD 1975, Rice Univ (GF)

NIEMAN, LINDA, Instr., Dean, Arts and Sciences office (1977). BA 1971, Univ. of Houston.

NOBLE, M. LARRY, Asst. Prof. of Health, Phys. Ed. and Rec. (1972). BS 1966, Eastern Ky. Univ , MA 196B, Univ of Md ; PhD 197D, Univ. of Tex (GF)

NOBLETT, DUANE P., Asst. Prof. of Art (1973). BFA 1966, Minneapolis Col. of Art and Design; MA 1970, MFA 1972, Univ. of Iowa.

NOONAN, JOHN P., Assoc. Dean of Graduate School; Prof. of English (1947, 1966, 1975). BS 1947, Rockhurst Col.; MS 195D, Kan. St. Univ., PhD 1955, Denver Univ. (GF)

NORDIN, JOHN A., Prof. of Economics (1961). BA 1935, MA 1937, PhD 1941, Univ. of Minn. (GF)

NORDIN, PHILIP, Prof. of Biochemistry; Biochemist, Agr. Exp. Sta. (1954, 1969). BS 1949, MS 195D, Univ. of Saskatchewan (Canada); PhD 1953, Iowa St Univ (GF)

NYBERG, BENJAMIN M., Assoc. Prof. of English (1965, 1975). BA 1955, Univ. of Wichita; MA 195B, Univ of Ariz . PhD 1965, Univ of Colo (GF)

O'BRIEN, PATRICIA J., Assoc Prof. of Anthropology (1967, 1972). BA 1962, BMA 1966, PhD 1969, Univ. of Ill. (GF)

O'CONNOR, SISTER THOMAS AQUINAS, Adjunct Prof. of History, (Saint Mary College) (1977). BA 1937, St Mary Col.; MA 1939, Catholic Univ of America; PhD 1949, St. Louis Univ

OGG, ROSELLA A., Instr. of Art (1965). BA 195B, MA 1963, Kan. St. Univ.

OLLINGTON, MARCUS H., Asst. Prof of Speech and Auditorium Manager (1969). Diploma, 194D, Conservatorium of Music; BA 1964, MA 1967, Univ. of N.C.

OLMSTEAD, DONALD R., Instr. of Military Science (1973).

OLSON, EDWIN G., Asst. Prof. of Economics (1969). BA 1956, MA 196D, Univ. of Calif.; PhD 1971, Univ of Wash. (GF)

O'NEIL, MICHAEL P., Asst. Prof. of Philosophy (1973). BA 1965, MA 1966, Miami Univ.; PhD 1972, Univ of Edinburgh, Scotland.

ORBACH, HAROLD L., Assoc. Prof. of Sociology (1969, 1975). BS 1951, The City Col. of N.Y.; PhD 1974, The Univ of Minn (GF)

O'SHEA, JOHN WILLIAM, Asst. Prof. of Art (1956, 196B). BFA 1954, Denver Univ.; MFA 1956, St. Univ. of Iowa (GF)

OSSAR, MICHAEL, Asst. Prof. of Modern Languages (1971). AB 1961, Cornell Univ.; MS 1963, MA 1967, PhD 1973, Univ. of Pa. (GF)

OTTENHEIMER, HARRIET J., Asst. Prof. of Anthropology (1969). BA 1962, Bennington Col.; PhD 1973, Tulane Univ (GF)

OTTENHEIMER, MARTIN, Assoc. Prof. of Anthropology (1969, 1977). BS 1962, Rensselaer Polytechnic Inst.; MA 1965, PhD 1971, Tulane Univ. (GF)

OUKROP, CARDL E., Assoc. Prof. of Journalism and Mass Communications (1969, 1975). BA 1956, Univ. of N D.; MA 1965, PhD 1969, Univ. of Iowa. (GF)

OWENS, JAMES H., Asst. Prof. of Military Science (1975). BS 1969, Auburn Univ.

PADY, STUART McGREGOR, Prof of Biology Emeritus; Mycologist, Agr. Exp. Sta. (1945, 1952, 1973). AB 192B, MA 1929, McMaster Univ.; PhD 1933, Univ. of Toronto. (GF)

PAGE, LEROY EARL, Assoc. Prof. of History (1969). BS 1951, Univ. of Ark.; BS 1955, MChemEng 195B, PhD 1963, Univ of Okla. (GF)

PARKER, S. THOMAS, Prof. of Mathematics (1947, 1951). BA 1931, MA 1934, Univ. of British Columbia, Canada; PhD 1947, Univ. of Cincinnati. (GF)

PARKER, WILLARD A., Asst. Prof. of Mathematics (197D). BA 196D, Univ. of Dre.; BD 1964, Fuller Theological Seminary; MA 1966, PhD 197D, Univ of Dre. (GF)

PARRISH, DONALD BAKER, Prof. of Biochemistry; Biochemist and Nutritionist, Agr. Exp. Sta. (1943, 1962). BS 1935, MS 1938, PhD 1949, Kan. St. Univ. (GF)

PARRISH, FRED LOUIS, Prof. of History Emeritus (1927, 1963). AB 1917, MA 1927, Northwestern Univ.. BD 1920, Garnett Biblical Inst.; PhD 1927, Yale Univ. (GF)

PAUKSTELIS, JOSEPH V., Assoc. Prof. of Chemistry (1966, 1974). BS 196D, Univ. of Wis.; PhD 1964, Univ. of Ill. (GF)

PAULSEN, AVELINA Q., Instr. of Biology (1974). BS 1959, MS 1962, Univ. of Philippines; PhD 1967, Univ of Wis.

PELISCHEK, MILTON Z., Instr. of English Emeritus (1965, 1977). BS 194B, MA 195D, Kan. St. Univ.

PELLETIER, PAUL, Asst. Prof. of Social Work (1972). BA 1949, Sacred Heart Seminary; STL 1953, Gregorian Univ.; MSW 195B, Catholic Univ. of America.

PELTON, MARION HERFORT, Assoc. Prof. of Music Emerita (192B, 1972). BM 1927, Univ. of Wis.; BS 1932, Kan. St. Univ.; MA 1957, Columbia Univ. (GF)

PERKINS, CHARLES C., JR., Prof. of Psychology (1969). BA 1941, Harvard; MA 1942, PhD 1946, St. Univ. of Iowa. (GF)

PERNG, SHIAN-KODNG, Assoc. Prof. of Statistics (196B, 1972). BS, Chung-Hsien Univ., Taiwan; MS 1961, Va Polytechnic Inst.; PhD 1967, Mich. St. Univ. (GF)

PETERS, GEORGE R., Assoc Prof. of Sociology; Assoc., Institute for Environmental Research (1967, 197D). BA 1962, MA 1964, PhD 196B, Univ. of Neb. (GF)

PETERSEN, JOHN D., Asst. Prof. of Chemistry (1975). BS 197D, Calif. St. Univ., L.A.; PhD 1975, Univ. of Calif., Santa Barbara (GF)

PETTIS, DOROTHY BRADFORD, Assoc. Prof. of Modern Languages Emerita (1927, 1966). BA 1919, MA 1924, Univ. of Neb.; 1922, Middlebury Col.; Certificate 1939, Univ. of Paris. (GF)

PHARES, E. JERRY, Prof. and Head, Department of Psychology (1955, 1964). BA 1951, Univ. of Cincinnati; MA 1953, PhD 1955, Ohio St. Univ. (GF)

PIGND, LOUIS, Assoc. Prof. of Mathematics (1969, 1973). BS 1961, Polytechnic Inst. of Brooklyn; MA 1965, Univ. of Conn.; PhD 1969, SUNY at Stony Brook. (GF)

PITTENGER, THAD H., Prof. of Biology; Geneticist, Agr. Exp. Sta. (1959). BS 1947, PhD 1951, Univ of Neb. (GF)

POLICH, GERALD, Asst. Prof. of Music (1966). BME 1961, MME 1966, Univ. of Colo.

POOLE, MIRIAM PICK, Instr. in Health, Phys. Ed. and Rec. (1961). BS 1943, Savage School for Phys. Ed. and Columbia Univ.; MA 1945, Columbia Univ.

PUJOL, ELLIOTT, Asst. Prof. of Art (1973). BA 196B, MFA 1971, Southern Ill. Univ. (GF)

PURCELL, KEITH F., Assoc. Prof. of Chemistry (1967, 197D). BA 1961, Central Col.; PhD 1965, Univ. of Ill. (GF)

QUINLEY, PAULA M., Adjunct Clinical Assoc. of Med. Tech. (1976). BA 1954, Univ. of Kan.; MS 1973, Kan. St. Univ.

RAGAN, JAMES F., JR., Asst. Prof. of Economics (1977). BA 1971, Mo. Univ.; MA 1972, PhD 1975, Wash. Univ. (GF)

RAINBOLT, HARRY R., Assoc. Prof. of Speech (1966). BS 196D, Southern Ill. Univ.; MS 1962, PhD 1965, Univ. of Ind (GF)

RAPPOPORT, LEON H., Prof. of Psychology (1964, 1974). BA 1953, N.Y. Univ.; MA 1962, PhD 1963, Univ. of Colo (GF)

RATCLIFFE, LAMAR CECIL, Instr. of Mathematics Emeritus (1964, 1974). BS 1933, U.S. Military Academy; MAT 1964, Duke Univ.

REAGAN, CHARLES E., Assoc. Prof. of Philosophy (1967, 1973). AB 1964, Holy Cross Col.; MA 1966, PhD 1967, Univ. of Kan. (GF)

REALS, WILLIAM J., Adjunct Clinical Assoc. of Med. Tech. (1976). BS 1944, MD 1945, MS (Med) 1949, Creighton Univ.

REECK, GERALD R., Asst. Prof. of Biochemistry, Asst. Biochemist, Agr. Exp. Sta. (1974). BA 1967, Seattle Pacific Col.; PhD 1971, Univ. of Wash. (GF)

REES, JOHN D., Assoc. Prof. of English (1965, 1972). BA 1947, Amherst Col.; PhD 1965, St. Univ. of Iowa. (GF)

RENDON, HUMBERTO M., Adjunct Clinical Assoc. of Med. Tech. (1976). MD 1964, Univ. of San Agustin.

REPLOGLE, RENATA J., Instr. of Art (1966). BA 1963, MA 1964, Northern Colo. Univ.

REPLOGLE, REX, Asst. Prof. of Art (1966, 1971). BFA 1964, MFA 1967, Univ. of Kan. (GF)

RICHARD, PATRICK, Prof. of Physics (1972). BS 1961, Univ. of Southwestern La.; PhD 1964, Fla. St. Univ (GF)

RICHTER, WILLIAM LOUIS, Assoc. Prof. of Political Science (1966, 1973). BA 1961, Willamette Univ.; MA 1963, PhD 196B, Univ. of Chicago. (GF)

RIGGS, HAZEL M., Assoc. Prof. of History Emerita (1945, 1952). AB 192D, MA 1923, Univ of Kan. (GF)

RISEMAN, LOUIS, Asst. Prof. of Geology (1946, 1947). BS 1934, MS 1936, Tufts Univ. (GF)

ROBEL, ROBERT JOSEPH, Prof. of Biology; Wildlife Conservationist, Agr. Exp. Sta. (1961, 1966). BS 1956, Mich. St. Univ.; BMS 1959, Univ. of Idaho; PhD 1961, Utah St. Univ. (GF)

ROCHAT, ELEANOR S., Instr. of English (1974). BS 1947, Eastern Ill. Univ.

ROCHE, THOMAS E., Asst. Prof. of Biochemistry; Asst. Biochemist, Agr. Exp. Sta. (1974). BS 1966, Regis Col. (Denver); PhD 197D, Wash. St. Univ. (GF)

RODKEY, L. SCOTT, Assoc. Prof. of Biology; Immunologist, Agr. Exp. Sta. (1970, 1975). BA 1964, PhD 196B, Univ of Kan. (GF)

ROGERSON, BREWSTER, Prof. of English (1953, 1967). AB 1941, Univ. of N.C.; PhD 1946, Princeton Univ. (GF)

ROHLES, FREDERICK H., Prof. of Psychology (1963, 1966). BS 1942, Roosevelt Univ.; MA 195D, PhD 1956, Univ of Tex (GF)

ROHRER, WAYNE C., Prof. of Sociology; Rural Sociologist, Agr. Exp. Sta. (1959, 1965). BS 1946, MS 194B, Tex. A & M Col.; PhD 1955, Mich. St. Univ. (GF)

ROLAND, PAUL, Assoc. Prof. of Speech (1977). BFA 1954, Univ. of N.M.; MA 1963, Northern Ill. Univ.; PhD 1967, Southern Ill. Univ.

ROSASCO, GREG, Adjunct Prof. of Chemistry (Physicist), BS 1964, Univ. of Scranton; MA 1966, PhD 197D, Fordham Univ

ROSENKILDE, CARL EDWARD, Assoc. Prof. of Physics (197D, 1975). BS 1959, Wash. St. Univ.; MS 196D, PhD 1966, Univ. of Chicago. (GF)

ROUFA, DONALD J., Assoc. Prof. of Biology, Agr. Exp. Sta. (1975). AB 1965, Amherst Col.; PhD 1970, The Johns Hopkins Univ.

RUBISON, R. MICHAEL, Asst. Prof. of Statistics; Consultant, Agr. Exp. Sta. (1976). BS 197D, Quincy Col.; MS 1971, Southern Ill. Univ.; MA 1974, PhD 1976, Ind. Univ. (GF)

RULIFFSON, WILLARD S., Prof. of Biochemistry; Biochemist, Agr. Exp. Sta. (1953, 196B). BS 194D, Buena Vista Col.; PhD 1953, Univ. of Iowa. (GF)

SAAL, FRANK E., Asst. Prof. of Psychology (1976). BA 1968, Univ. of Rochester; MS 1973, Rensselaer Poly. Inst.; PhD 1976, Penn St. Univ. (GF)

SAGESER, ADELBERT BOWER, Prof. of History Emeritus (1938, 1941, 1973). AB 1925, Neb. St. Teachers Col. (Wayne); MA 193D, PhD 1934, Univ. of Neb. (GF)

SAMELSON, FRANZ, Prof. of Psychology (1957, 1969). Diploma in Psychology 1952, Univ. of Munich (Germany); PhD 1956, Univ. of Mich. (GF)

SAMELSON, PHOEBE, Instr., Dean, Arts and Sciences office (196B). BA 195D, Bates; MN 1953, Yale.

SCALES, MARGARET B., Adjunct Clinical Assoc. of Med. Tech. (1976). AB 1946, Barnard Col.; MA 1947, PhD 1955, Columbia Univ.; MD 196D, Univ. of N.C.

SCHEER, RICHARD K., Assoc. Prof. of Philosophy (196B). AB 195D, Univ. of Neb.; MA 1951, Univ of Fla ; PhD 1958, Univ. of Neb. (GF)

SCHIEVEL, ULRICH W., Research Assoc. of Physics (1976). BS 1967, Gynasium Altenkirchen, Germany, MS 1972, PhD 1975, Univ of Giessen, Germany.

SCHMIEDEKAMP, ANN M., Research Assoc. of Physics (1976). BS 197D, PhD 1976, Univ. of Tex.

SCHMIEDEKAMP, CARL W., Research Assoc. of Physics (1976). BS 197D, PhD 1975, Univ. of Tex.

SCHMIDT, TERESA TEMPERO, Asst. Prof. of Art (1972, 1976). BA 1963, MA 1971, Central Wash. St. Col., MFA 1972, Wash. St. Univ.

SCHNEIDER, HAROLD WILLIAM, Asst. Prof. of English (1961, 1969). BA 1950, Univ. of Minn.

SCHNEIDER, MARY WILLIS, Assoc. Prof. of English (1964, 1968, 1977). BA 1949, MA 1952, St. Univ. of Iowa.; PhD 1964, Univ. of Minn. (GF)

SCHNUR, ALFRED C., Prof. of Sociology (1970). BA 1941, Univ. of Pittsburgh; PhM 1944, PhD 1949, Univ. of Wis. (GF)

SCHENCK-HAMLIN, WILLIAM J., Asst. Prof. of Speech (1976). BS 1969, MA 1971, Kan. St. Univ.; PhD 1976, Univ. of Dre. (GF)

SCHRENK, WILLIAM G.; Prof. of Chemistry Emeritus (1938, 1951, 1975). AB 1932, Westmar Col.; MS 1936, PhD 1945, Kan. St. Univ. (GF)

SCHWAB, CHARLES M., JR., Instr. in Aerospace Studies (1972).

SEALANDER, JUDITH A., Asst. Prof. of History (1977). BA 1971, MA 1973, Univ of Arkansas; PhD 1977, Duke Univ. (GF)

SELF, HUBER, Assoc. Prof. of Geography (1947, 1953, 1975). BS 1941, Central Dkla. St. Col.; MS 1947, Dkla. St. Univ. (GF)

SEMANITZKY, MISCHA, Assoc. Prof. of Music (1976). BM 1950, MM 1951, Yale Univ.; EdD 1953, Columbia Univ.

SETHNA, PROCHY P., Research Assoc. of Physics (1975). BS 196D, Bombay Univ.; MS 1972, PhD 1975, Kan. St. Univ.

SETSER, DONALD W., Prof. of Chemistry (1963, 1970). BS 1956, MS 1958, Kan. St. Univ.; PhD 1961, Univ. of Wash. (GF)

SEYLER, H.L., Asst. Prof. of Geography (1970). BA 1963, MA 1967, Kan. St. Univ.; PhD 1971, Ind. Univ.

SHANTEAU, JAMES C., Assoc. Prof. of Psychology (1971, 1975). BA 1966, San Jose St. Col.; PhD 197D, Univ. of Calif., San Diego. (GF)

SHAPIRO, LINDA G., Asst. Prof. of Computer Science (1974). BS 197D, Univ. of Ill. at Urbana, Champaign; MS 1972, PhD 1974, Univ. of Iowa. (GF)

SHAVER, HAROLD C., Asst. Prof. of Journalism (1972). BA 1960, Muskingum Col.; MS 1963, PhD 1976, Syracuse Univ. (GF)

SHAW, BRADLEY A., Asst. Prof. of Modern Languages (1974). BA 1968, Lewis & Clark Col.; MA 1969, Northwestern Univ.; PhD 1974, Univ. of N.M. (GF)

SHELTON, LEWIS E., Asst. Prof. of Speech (1973). BA 1963, Taylor Univ.; MA 1965, Ind. Univ.; MA 196B, PhD 1971, Univ. of Wis.

SHELTON, LYNN M., Asst. Prof. of Speech (1973). BS 1966, N.Y. Univ.; MA 1968, PhD 1973, Univ. of Wis.

SHENKEL, CLAUDE WESLEY, JR., Prof. of Geology (1949, 1958). BS 1941, Kan St. Univ.; MS 1947, PhD 1952, Univ. of Colo. (GF)

SHULL, PAUL, Assoc. Prof. of Music (1960). BME 1950, MME 1951, Univ. of Colo.; DMA 1966, Eastman School of Music (Univ. of Rochester). (GF)

SHULT, ERNEST E., Distinguished Regents Prof. (1974). BA 195B, MA 1961, Southern Ill. Univ.; PhD 1964, Univ. of Ill. (GF)

SIODALL, WILLIAM R., Prof. of Geography; Head, Department of Geography (1962, 1965, 1972). AB 195D, Harvard Univ.; MA 1955, PhD 1959, Univ. of Wash. (GF)

SIOORFSKY, FRANK M., Assoc. Prof. of Music (1965, 1974). BME 1952, Emporia St. Univ.; MM 1957, DMA 1974, Eastman Conservatory of Music (Univ. of Rochester). (GF)

SILKER, RALPH, Prof. of Chemistry Emeritus (1941, 197D). BA 1927, Univ. of Dubuque; MS 1931, PhD 1934, St. Univ. of Iowa. (GF)

SINCOVEC, RICHARD F., Assoc. Prof. of Computer Science (1970, 1974). BS 1964, Univ. of Colo.; MS 1967, PhD 196B, Iowa St. Univ. (GF)

SIRRIDGE, SISTER AGNES THERESA, Adjunct Prof. of History, (Saint Mary College) (1977). BA 1943, St. Mary Col.; PhD 1954, St. Louis Univ.

SLOAN, THOMAS J., Asst. Prof. of Political Science (1975). BA 196B, Syracuse Univ.; MA 1969, Mich. St. Univ.; PhD 1974, Univ. of N.C. (GF)

SLOAT, FLOYD B., Assoc. Prof. of Mathematics (1946, 1966). BA 1938, Duachita Col.; MA 1941, Univ. of Ark.

SLOOP, JEAN C., Assoc. Prof. of Music (1959, 1975). BA 1953, Gettysburg Col.; MA 1956, DMA 1974, Eastman School of Music (Univ. of Rochester). (GF)

SMITH, ANN S., Instr. of Biology (1970). BS 195B, Augustana Col.; MS 1960, Univ. of Colo.

SMITH, CHRISTOPHER C., Assoc. Prof. of Biology (197D). BA 196D, Univ. of Colo.; MA 1963, PhD 1965, Univ. of Wash. (GF)

SMITH, JOHN P., Adjunct Clinical Instr. of Med. Tech. (1976). AB 1962, Emporia St. Univ.

SMITH, RICHARD, Asst. Prof. of Modern Languages (1975). BA 1965, Lewis & Clark Col.; MA 1969, PhD 1974, Cornell Univ.

SMITH, ROBIN, Asst. Prof. of Philosophy (1974). BA 196B, Univ. of Tenn. at Chattanooga; PhD 1974, Claremont.

SNYDER, VERYLE E., Asst. Prof. of Health, Phys. Ed. and Rec. (1954). BS 1942, MS 1950, Kan. St. Univ. (GF)

SOCOLOFSKY, HOMER E., Prof. of History (1946, 1963). BS 1944, MS 1947, Kan. St. Univ.; PhD 1954, Univ. of Mo. (GF)

SORENSEN, CHRISTOPHER N., Asst. Prof. of Physics (1977). BS 1969, Univ. of Neb.; MS 1973, PhD 1976, Univ. of Colo.

SPANGLER, JOHN O., Assoc. Prof. of Physics (1965, 1969). BS 1958, Kan. St. Univ.; PhD 1961, Duke Univ. (GF)

SPARKS, MARY K., Instr., Journalism and Mass Communications (1975). BS 1966, Southwestern Mo. St.; MS 1974, Iowa St. Univ.

SPOONER, BRIAN S., Assoc. Prof. of Biology (1971, 1975). BS 1963, Duincy Col.; PhD 1969, Temple Univ. (GF)

STACEY, KARL, Prof. of Geography Emeritus (1943, 1959). BA 1936, MA 1937, Univ. of Colo.; PhD 1955, Clark Univ. (GF)

STAMEY, WILLIAM L., Dean; Prof. of Mathematics (1953, 197D). AB 1947, Univ. of North Colo.; MA 1949, PhD 1952, Univ. of Mo. (GF)

STEINBAUER, ROBERT ANDRUS, Prof. and Head, Department of Music (197D). BM 1950, MM 1951, Univ. of Mich.; Doc. of Music 1959, Ind. Univ. (GF)

STEWART, DONALD C., Assoc. Prof. of English (1968, 1975). BA 1952, MA 1955, Univ. of Kan.; PhD 1962, Univ. of Wis. (GF)

STEWART, MICHAEL J., Asst. Prof. of Health, Phys. Ed., and Rec. (1977). BS 197D, Calif. St. Polytechnic Univ.; MA 1972, PhD 1977, Dhio St. Univ.

STOVER, STEPHEN L., Assoc. Prof. of Geography (1964, 1969). AB 1940, McPherson Col.; MA 1941, Univ. of Kan.; MS 1955, PhD 1960, Univ. of Wis. (GF)

STRECKER, GEORGE E., Prof. of Mathematics (1972, 1977). BS 1961, Univ. of Colo.; PhD 1966, Tulane Univ. (GF)

STROMBERG, KARL ROBERT, Prof. of Mathematics (1968). BA 1953, MA 1954, Univ. of Dre.; PhD 1959, Univ. of Wash. (GF)

STURR, EDWARD R., Asst. Prof. of Art (1974). BA 1959, St. Ambrose Col.; MS 1964, Ill. Inst. of Tech.; EdD 1973, Ill. St. Univ. (GF)

SULEIMAN, MICHAEL WADIE, Prof. and Head of Political Science (1965, 1972). BA 1960, Bradley Univ.; MS 1962, PhD 1965, Univ. of Wis. (GF)

SULLIVAN, EUGENIA L., Adjunct Clinical Instr. of Med. Tech. (1976). BA 1959, Univ. of Kan.; Cert. in Med. Tech. 1970, Lattimore-Fink School of Med. Tech.

SUMMERHILL, R. RICHARD, Asst. Prof. of Mathematics (1972). BA 1966, Monmouth Col.; MS 1967, PhD 1969, Univ. of Iowa. (GF)

SUROWSKY, DAVID B., Asst. Prof. of Mathematics (1977). BA 1971, Calif. St. Univ.; MS 1972, PhD 1975, Univ. of Ariz. (GF)

SUTTON, MARY ELLEN, Asst. Prof. of Music (1974, 1977). AA 1960, Graceland Col.; BM 1963, MM 1968, Univ. of Mo. at Kansas City. DMA 1975, Univ. of Kan. (GF)

SWANSON, JANIS K., Adjunct Clinical Instr. of Med. Tech. (1976). BA 1958, Wichita St. Univ.

SWEEDLUN, VERNE SEBASTIAN, Prof. of History Emeritus (1941, 1970). AB 1923, Bethany Col.; MA 192B, Univ. of Kan.; PhD 1940, Univ. of Neb. (GF)

SWILER, JAMES P., Asst. Prof. of Art (197D, 1973). BSE 1966, Emporia St. Univ.; MFA 197D, Wichita St. Univ.

TAWARA, HIROYUKI, Prof. of Physics (visiting) (1977). BS 1958, PhD 1971, Kyushu Univ.

TAYLOR, RICHARD J., Adjunct Clinical Assoc. of Med. Tech. (1976). BA 1944, Univ. of Calif. at Berkeley; MD 1949, Creighton Univ.

TAYLOR, ROBERT BARTLEY, Assoc. Prof. of Anthropology (1957, 1969). BS 1949, Wheaton Col.; MA 1956, PhD 196D, Univ. of Dre. (GF)

THOMAS, LLOYD B., JR., Assoc. Prof. of Economics (1968, 1974). BA 1963, MA 1964, Univ. of Mo.; PhD 1970, Northwestern Univ. (GF)

THOMPSON, CHARLES P., Prof. of Psychology (1965, 1972). BS 195B, Wis. St. Col.; MS 196D, PhD 1962, Univ. of Wis. (GF)

TILGHMAN, BENJAMIN R., Prof. and Head of Department of Philosophy (1967). AB 195D, MA 1954. Wash. Univ.; PhD 1959, Univ. of Wash. (GF)

TOMB, A. SPENCER, Assoc. Prof. of Biology; Biosystematics Agr. Exp. Sta. (1974). BS 1966, Univ. of the South; PhD 1970, Univ. of Tex., Austin. (GF)

TOMORY, RAYMOND J., Instr. of Aerospace Studies (1976).

TUNSTALL, GEORGE C., Asst. Prof. of Modern Languages (1973). BA 1964, Hamilton Col.; MA 1966, PhD 1968, Princeton Univ.

TWISS, NANCY, Instr., Dean, Arts and Sciences office (1968). BA 1954, Colo. Col.; MS 1974, Kan. St. Univ.

TWISS, PAGE CHARLES, Prof. of Geology (1953, 1969). BS 195D, MS 1955, Kan. St. Univ.; PhD 1959, Univ. of Tex. (GF)

UHLARIK, JOHN JEFFERY, Assoc. Prof. of Psychology (197D, 1975). BS 1965, Univ. of Wis.; MS 1967, PhD 1970, Univ. of Wash. (GF)

UNDERWOOD, JAMES R., JR., Prof. and Head of Geology (1977). BS 1948, 1949, MA 1956, PhD 1962, Univ. of Tex., Austin. (GF)

UNEKIS, JOSEPH K., Asst. Prof. of Political Science (1977). BS 1963, Eastern Ill. Univ.; MA 1972, PhD 1977, Ind. Univ.

UNGER, ELIZABETH A., Asst. Prof. of Computer Science (1966, 1974). BS 1961, MS 1963, Mich. St. Univ.

URBAN, JAMES E., Assoc. Prof. of Biology (1970, 1977). BA 1965, PhD 1968, Univ. of Tex. (GF)

UTHOFF, JOHN S., Asst. Prof. of Speech. BA 1968, MFA 1973, Univ. of Iowa.

VAN SWAAY, MAARTEN, Assoc. Prof. of Chemistry (1963, 1968). BBS 1951, 'Drs' 1956, Leiden Univ., Netherlands; PhD 1956, Princeton Univ. (GF)

VOGT, JOHN L., Assoc. Prof. of Art (1963, 1971). BFA 196D, Kan. City Art Inst.; MFA 1963, Univ. of Ill. (GF)

VOVK, FRANK, Instr. of Military Science (1973).

WAGNER, G. JACK, Instr. of Aerospace Studies (1972).

WALKER, MARGARET Y., Asst. Prof. of Music (1971, 1977). BM 1970, Kan. St. Univ., MM 1974, Tex. Christian Univ.

WALKER, RODNEY G., Assoc. Prof. of Music (1966, 1977). BME 1959, Univ. of Neb.; MME 1961, Wichita St. Univ. (GF)

WALKER, WARREN VINCENT, Prof. of Music (1948, 1959). BA 1946, Univ. of Wash.; MM 1948, Cincinnati Conservatory of Music. (GF)

WALLENTINE, VIRGIL E., Assoc. Prof. of Computer Science (1972). BS 1965, MS 1970, PhD 1972, Iowa St. Univ. (GF)

WALTERS, CHARLES P., Prof. of Geology (1936, 1972). BS 1936, MS 1937, Kan. St. Univ.; PhD 1957, Cornell Univ. (GF)

WARDEN, SUSAN L., Instr. of Health Phys. Ed., and Rec. (1977). BA 1974, Brown Univ.; MA 1977, Univ. of N.C.

WARREN, ANN A., Instr. of English (1977). BA 1964, Fla. Southern Col.; MA 1968, Univ. of Ga.

WARREN, LELAND E., Asst. Prof. of English (1976). BA 1966, Emory Univ.; MA 1968, Univ. of Georgia; PhD 1976, Univ. of Ill. (GF)

WAUTHIER, RAYMOND AUGUST, Assoc. Prof. of Health, Phys. Ed., and Rec. (1949). BS 1945, Albion Col.; MS 1947, Drake Univ. (GF)

WEAVER, OLIVER LAURENCE, Assoc. Prof. of Physics (1970, 1975). BS 1965, Calif. Inst. of Tech.; PhD 197D, Duke Univ. (GF)

WEIS, JERRY S., Assoc. Prof. of Biology; Plant Physiologist, Bioethics (1966, 1972). AB 195B, Kan. Wesleyan Univ.; MA 196D, PhD 1964, Univ. of Kan. (GF)

WEISENBURGER, PATRICIA A., Instr. of English (1975). BA 1956, MA 1959, Univ. of Ill.

WEST, RONALD R. Assoc. Prof. of Geology (1969, 1974). AA 1955, Centralia Jr. Col.; BS 195B, Univ. of Mo. at Rolla; MS 1962, Univ. of Kan.; PhD 197D, Univ. of Dkla. (GF)

WEYERTS, ALFRED C., Instr. of Chemistry (1963). BS 194B, Denver Univ.

WHITE, ALFRED EVERETT, Prof. of Mathematics Emeritus (19D9, 1950). BS 19D4, MS 19D9, Purdue Univ. (GF)

WHITE, CHAPPELL, Prof. of Music (1974). BA 194D, Emory Univ.; BM 1947, Westminster Choir Col.; PhD 1957, Princeton Univ. (GF)

WHITE, MARY FRANCES, Assoc. Prof. of English (1947, 1966). BS 1928, MS 193D, Kan. St. Univ.; PhD 1955, Denver Univ. (GF)

WHITE, STEPHEN E., Asst. Prof. of Geography (1975). BA 1969, MA 1972, PhD 1974, Univ. of Ky. (GF)

WHITTEMORE, DONALD O., Asst. Prof. of Geology (1972). BS 1966, Univ. of N.H.; PhD 1972, Pa. St. Univ. (GF)

WILCOXON, GEORGE DENT, Prof. of History (1946, 194B). AB 1936, MA 193B, PhD 1941, Univ. of Calif. at Los Angeles. (GF)

WILLIAMS, OUDLEY, Distinguished Regents Prof. of Physics (1964). AB 1933, MA 1934, PhD 1936, Univ. of N.C. (GF)

WILLIAMS, HELEN, Asst. Prof. of English (1974). AB 1961, Bard Col.; MA 1965, Dhio St. Univ.; PhD 1973, Univ of Denver.

WILLIAMS, LARRY G., Asst. Prof. of Biology (1970). BS 1961, MS 1963, Univ. of Neb.; PhD 196B, Calif. Inst. of Tech. (GF)

WILLIAMS, ROBERT E., Asst. Prof. of Mathematics (1965). BS 1959, MA 1961, PhD 1965, Univ. of Mo. (GF)

WILLIAMS, TIMOTHY ALOEN, Assoc. Prof. of Political Science (1967). AB 1954, Davidson Col.; PhD 1964, Univ. of N.C. (GF)

WILSON, FRED E., Assoc. Prof. of Biology; Physiologist, Agr. Exp. Sta (1965). AB 195B, MA 196D, Univ. of Kan.; PhD 1965, Wash. St. Univ. (GF)

WIMMER, EDWARD JOSEPH, Prof. of Biology Emeritus (192B, 1971). AB 1925, MA 1927, PhD 192B, Univ. of Wis. (GF)

WINEGARDNER, CARROLL, Asst. Prof. of Art (1966, 1972). BFA 1960, Kan. City Art Inst.; MFA 1963, Univ. of Dkla.

WOLDT, GRACE S., Instr. of Mathematics Emerita (1946). AB 1927, Dhio Wesleyan Univ.

WONG, PETER P., Asst. Prof. of Biology, Agr. Exp. Sta. (1976). BS 1966, Calif. St. Univ.; BA 1967, PhD 1971, Oregon St. Univ. (GF)

WOODWARD, GARY L., Asst. Prof. of Art (1971, 1972). AB 1961, Northern Colo. Univ.; MA 1964, Univ. of Iowa; MFA 1969, Univ. of Wash.

YEE, KANE, Prof. of Mathematics (196B, 1973). BS 1957, MS 195B, PhD 1963, Univ. of Calif. at Berkeley. (GF)

YOUNG, PAUL M., Prof. of Mathematics; Vice President for Univ. Development (197D). AB 1937, Miami Univ.; MA 1939, PhD 1941, Dhio St. Univ. (GF)

ZIMMERMAN, JOHN L., Prof. of Biology (1963, 196B, 1976). BS 1953, MS 195B, Mich. St. Univ.; PhD 1963, Univ. of Ill. (GF)

ZOLLMAN, DEAN ALVIN, Assoc. Prof. of Physics (1970, 1977). BS 1964, MS 1965, Ind. Univ.; PhD 197D, Univ. of Md. (GF)

ZUTI, WILLIAM B., Asst. Prof. of Health, Phys. Ed., and Rec. (1972). BS 1965, Slippery Rock St. Col.; MA 1971, PhD 1972, Kent St. Univ. (GF)

McCAIN, KENNETH G., Asst. Prof. of Business Administration (1977). BA 1969, MBA 1971, Eastern Wash. St. Col; PhD 1977, Univ. of Dre.

McCARTY, NAOMI J., Asst. Prof. of Business Administration (1977). BA 1967, Pittsburg St. Univ.; MBA 1972, PhD 1974, Univ. of Ark.

MULANAX, ALVIN E., Assoc. Prof. of Business Administration Emeritus (1947, 1966, 1977). BS 1946, MS 1951, Kan. St. Univ. (GF)

NORVELL, WAYNE, Assoc. Prof. of Business Administration (1977). BS 1964, Ark. Polytechnic Col.; MBA 1965, Univ. of Ark.; DBA 1973, Miss. St. Univ. (GF)

O'BRIEN, TERRENCE V., Prof. of Business Administration (1976). AB 1963, Univ. of Calif. at Berkeley; MBA 1966, Calif. St. Univ. at Long Beach; PhD 1969, Columbia Univ. (GF)

OH, JOHN S., Asst. Prof. of Business Administration (1977). BA 1967, Howard Payne Col., Brownwood, Tex.; PhD 1977, Univ. of Va.

POHLMAN, RANDOLPH A., Asst. Prof. of Business Administration (1976). BS 1967, MS 1969, Kan. St. Univ.; PhD 1976, Dkla. St. Univ. (GF)

RAPP, CHARLES W., Asst. Prof. of Business Administration Emeritus (1955, 196B).' BS 1931, MS 1946, Emporia St. Univ.

RICHARDS, VERLYN D., Prof. of Business Administration (1965, 1975). BS 1956, MS 196D, Kan. St. Univ.; CPA 1961, Kansas; PhD 1967, Univ. of Ill.

RILEY, MERRILL J., Asst. Prof. of Business Administration (1966). BS 1951, John Brown Univ.; MBA 1955, Univ. of Ark.

STARK, MAURICE E., Assoc. Prof. of Business Administration (1976). BS 1959, MS 1966, Kan. St. Univ.; PhD 1972, Univ. of Mo. (GF)

STEWART, KAY C., Asst. to Dean; Instr. in Business Administration (1972). BS 196B, W. Va. Inst. of Tech.; MS 1971, Ft. Hays St. Univ.

STOCKARD, JANE B., Instr. in Business Administration (1971). BS 1969, MS 1971, Kan. St. Univ.; CPA 1971, Kansas.

STREIT, IRVA KAY, Instr. in Business Administration (1973). BS 1969, MS 1973, Kan. St. Univ.

THIESSEN, EMIL A., Assoc. Prof. of Business Administration (196B). AB 1948, Tabor Col.; MS 1951, Emporia St. Univ.; EdD 1959, Colo. St. Col.

TOWNSEND JAMES B., Asst. Prof. of Business Administration (1977). BS 1945, U.S. Military Acad.; MA 1964, DBA 1976, Geo. Wash. Univ.

VADEN, RICHARD E., Assoc. Prof. of Business Administration (1969, 1973). BBA 196D, The Univ. of Tex. at Austin; MBA 1965, DBA 1970, Tex. Tech. Univ. (GF)

WINKLER, ALBERT L., Assoc. Prof. of Business Administration (1976). BA 1967, MA 196B, PhD 1970, Kan. St. Univ.

College of Business Administration

BARTON-OOBENIN, JOSEPH, Prof. of Business Administration (195B, 1972). BS 1956, MA 195B, PhD 1966, Univ. of Neb. (GF)

BONCZKOWSKI, MARY H., Instr. in Business Administration (1977). BS 1975, MAcc 1977, Kan. St. Univ. CPA 1977.

BROWN, THOMAS L., Assoc. Prof. of Business Administration (1972, 1976). BS 1966, MBA 196B, PhD 1972, Dkla. St. Univ. (GF)

BUZENBERG, MILDRED E., Asst. Prof. of Business Administration (1964, 196B). BA 193B, Mich. St. Univ.; MS 1951, Kan. St. Univ.

CALDWELL, CHARLES W., Asst. Prof. of Business Administration (1976). BS 1966, MBA 1972, Univ. of Tenn.

CASTRO, CONSTANZA, Instr. in Business Administration (1976). BS 1975, Univ. of Dre.; MBA 1976, Kan. St. Univ.

CLARK, WILLIAM J., Prof. of Business Administration Emeritus (1946, 1961). BS 1929, Pittsburg St. Univ.; MA 1940, St. Univ. of Iowa; CPA 1954, Kansas. (GF)

CLEMENT, BETTYE K., Instr. of Business Administration (1974, 1976). BS 1971, Austin Peay St. Univ.

COLEMAN, RAYMOND J., Prof. of Business Administration (1965, 1969). BS 194B, Univ. of Kan., MA 1963, Central Mo. St. Col.; PhD 1967, Univ. of Ark. (GF)

OOERING, MILDRED, Asst. Prof. of Business Administration (1974). BS 1965, Univ. of Minn.

DONNELLY, OAVID P., Instr. in Business Administration (1977). BS 1973, MBA 1977, Kan. St. Univ.

ERIKSEN, CONRAO J.K., Assoc. Prof. of Business Administration Emeritus (1946, 1947). BA 1929, Univ. of Kan.; MBA 1931, Harvard Univ.

FOX, KENNETH L., Prof. of Business Administration (1969). BA 1953, MA 196D, Baylor Univ.; CPA 195B, Texas, Louisiana, and Kansas; CPA 1971, Kansas; PhD 1966, Univ. of Ill. (GF)

FERGUSON, WAOE, Asst. Prof. of Business Administration (1977). BS 1965, MBA 1972, Okla. St. Univ.; PhD 1977, Dhio St. Univ.

GENTRY, JAMES, Assoc. Prof. of Business Administration (1977). BS 1969, Kan. St. Univ.; MBA 1971, DBA 1973, Ind. Univ. (GF)

GINN, MARY LEA, Instr. in Business Administration (1973). BS 1969, MEd 1972, Univ. of Ark.

GRAHAM, JOHN, Assoc. Dean; Assoc. Prof. of Business Administration (197D). BA 1967, Kan. St. Univ.; MBA 196B, PhD 197D, Univ. of Ark. (GF)

GUOGELL, OOROTHY B., Asst. Prof. of Business Administration Emeritus (1943, 1954, 1976). BS 193B, MS 1946, Kan. St. Univ.

GUGLER, MERLE E., Assoc. Prof. of Business Administration (1947, 1959). BS 194D, Emporia St. Univ.; MS 194B, Kan. St. Univ.; CPA 1956, Kansas. (GF)

HOLLINGER, ROBERT O., Asst. Prof. of Business Administration (1966). BS 1964, MS 196B, PhD 1973, Kan. St. Univ.

INNES, LINOA L., Instr. in Business Administration (1975). BS 196D, MS 1974, Kan. St. Univ.

JONES, C. CLYDE, Prof. of Business Administration (196D). AB 1944, Marshall Univ.; MA 195D, PhD 1954, Northwestern Univ. (GF)

LAUGHLIN, EUGENE J., Prof. of Business Administration (1955, 197D). BS 1951, Rockhurst Col.; MS 1959, Kan. St. Univ.; CPA 196D, Kansas; PhD 1965, Univ. of Ill. (GF)

LYNN, ROBERT A., Dean; Prof. of Business Administration (196B). BS 1951, Maryville Col.; MS 1955, Univ. of Tenn.; PhD 195B, Univ. of Ill. (GF)

MAXFIELO, MARGARET W., Asst. Prof. of Business Administration (1977). BA 1947, Dberlin Col., Ohio; MS 194B, Univ. of Wis.; PhD 1951, Univ. of Ore.

College of Education

ALBRACHT, JAMES J., Assoc. Prof. (1966, 197D). BS 194B, MS 1954, Univ. of Neb.; PhD 1966, Mich. St. Univ. (GF)

ALEXANOER, LOREN R., Asst. Prof. of Education and Modern Languages (1972). BM 1951, Southwestern Col.; MA 1954, Colo. St. Col. of Educ.; MA 1965, PhD 1972, Mich. St. Univ.

APEL, J. DALE, Prof.; Assoc. State Leader, 4-H and Youth (1962, 1967). BS 195D, Kan. St. Univ.; MS 1961, The American Univ.; PhD 1966, Univ. of Chicago. (GF)

BAILEY, GERALO O., Assoc. Prof. (1972, 1976). BS 1966, MEd 1969, EdD 1972, Univ. of Neb. (GF)

BAKER, HARRY LEIGH, Prof. of Education Emeritus (1946, 1963). AB 192D, LLD 1951, Baker Univ.; BS 1922, Kan. St. Univ.; AM 192B, Univ. of Chicago; PhD 1934, Yale Univ. (GF)

BARTEL, ROY A., Assoc. Prof. and Coordinator of Field Experiences (1963, 197D). AB 1942, Bethel Col.; MSE 1949, EdD 1959, Univ. of Kan. (GF)

BLOOMQUIST, MARGARET CHRISTINE, Dir. of Student Personnel Services and Instr. (1967). AB 1941, Bethany Col.; MBA 1949, Univ. of Denver.

BOYER, JAMES BUCHANAN, Prof. (1971, 1975). BS 1956, Bethune-Cookman Col., Fla.; MEd 1964, Fla. A & M Univ.; PhD 1969, Dhio St. Univ. (GF)

BRAOLEY, FRED O., Assoc. Prof. (1972, 1976). BA 1962, Colo. St. Col.; MEd 1970, PhD 1972, Univ. of Wyo. (GF)

BRADLEY, HOWARO RALEY, Prof. Emeritus (1951, 1963). BS 193D, MS 1937, Kan. St. Univ. (GF)

BYARS, JACKSON A., Asst. Prof. (1969). BA 1959, Municipal Univ. of Omaha; MA 1964, Colo. St. Col.; PhD 197D, Univ. of Neb. (GF)

CAINE, HOMER D., Asst. Prof. of Education and Music (1966). BM 194D, Drake Univ.; MS 1957, Kan. St. Univ. (GF)

CALVANO, MICHAEL A., Asst. Prof. (1972). BS 196B, Georgetown Univ.; MS 1970, Univ of Bridgeport (Conn.); PhD 1973, Southern Ill. Univ. (GF)

CARPENTER, FRANK R., Assoc. Dean, Col. of Agriculture and Assoc. Prof. (1961, 1969). BS 194B, MS 1951, Kan. St. Univ.; PhD 1967, Univ. of Mo. (GF)

CRAIG, M. OOROTHY, Asst. Prof. of Education Emerita (1959, 1973). BS 1931, Bethany Col.; BS 1941, Emporia St. Univ.; MA 1944, Columbia Univ.

DANSKIN, DAVIO G., Prof. of Psychology and Education, Center for Student Development (1959, 1966, 196B). AB 195D, Univ. of Redlands; MA 1951, PhD 1954, Dhio St. Univ. (GF)

OE CHENNE, JAMES A., Asst. Prof. (1976). BS 197D, MS 1971, Southern Ill. Univ.; EdD 1976, Va. Polytechnic Inst. & St. Univ.

OE MANO, JOHN WESLEY, Prof. (194D, 1959). AB 1937, Univ. of Kan.; MS 194D, Kan. St. Univ.; EdD 1953, Univ. of Colo. (GF)

OIXON, LYLE, Prof. of Mathematics (1963, 1969). BS 194B, MS 195D, Dkla. St. Univ.; PhD 1963, Univ. of Kan. (GF)

OOTTS, WAYNE, Asst. Prof. (1975). BS 1965, MA 1966, N. Ariz. Univ.; PhD 1972, Univ. of Ore. (GF)

OYCK, NORMA J., Asst. Prof. (1976). BA 1957, Bethany Col.; MS 197D, EdD 1972, Univ. of Kan. (GF)

EAVES, THOMAS A., Asst. Prof. (1976). BS 1967, MS 197D, EdD 1976, N.C. St. Univ.

FIELO, RALPH G., Prof. and Head, Dept. of Adult and Occupational Education (1972, 1976, 1977). BS 195D, MS 1966, Kan. St. Univ.; PhD 197D, Purdue Univ. (GF)

GOODENOW, PHILLIP E., Asst. Instr. (1967). BA 1953, Kan. Wesleyan (Salina).

GOODYEAR, RODNEY K., Asst. Prof. (1976). AB 1969, Augustana Col.; EdM 1970, PhD 1972, Univ. of Ill. (GF)

GREEN, FINIS McGRADY, Prof. of Education Emeritus (1948, 1967). BS 1922, Pittsburg St. Univ.; MS 1929, Univ. of Kan.; EdD 1949, Univ. of Colo. (GF)

GREEN, GARY, Asst. Prof. (1975). BS 1966, Southwestern Dkla. St. Univ.; MS 1972, Univ. of Mo.; EdD 1974, Okla. St. Univ. (GF)

GRIFFITH, MARY EVAN, Assoc. Prof. (1969). BS 195D, Kan. St. Univ.; MS 1957, Iowa St. Univ.; PhD 1966, Dhio St. Univ.

HALL, LAWRENCE FENOR, Assoc. Prof. of Education Emeritus (1926, 1966). BS 1923, MS 1927, Kan. St. Univ (GF)

HANNA, GERALD, Prof. (1967, 1972, 1976). AB 1956, MA 1959, Long Beach St. Col.; EdD 1965, Univ. of Southern Calif. (GF)

HARRIS, MARY M., Asst. Prof. (1974). A8 1967, Goucher Col., Md.; EdM 1969, Shippensburg St. Col., Pa.; PhD 1975, Univ. of Pittsburgh. (GF)

HAUSE, RICHARD G., Prof. (1966, 1970, 1975). AB 1954, MA 1955, Colo. St. Col.; EdD 1966, Univ. of Colo. (GF)

HAUSMANN, EVELYN L., Assoc. Prof. (1976). 8S 1961, Lindenwood Col.; MEd 1965, St. Louis Univ.; PhD 1976, Univ. of Mo.

HAZLETT, EMERSON L., Asst. Prof. of Economics and Commerce (1969). BS 1948, MS 1964, Univ. ot Kan.; PhD 1973, Kan. St. Univ.

HEERMAN, CHARLES, Asst. Prof. (1975). BA 1966, MS 197D, EdD 1974, Dkla. St. Univ. (GF)

HERSHEY, MYRLISS A., Asst. Prof. (1976). BS 1951, Tabor Col.; MS 1965, Emporia St. Univ.; PhD 1977, Kan. St. Univ. (GF)

HEWITT, THOMAS W., Asst. Prof. (1974). BA 1960, MA 1966, W. Mich Univ.; EdD 1971, Univ. of Houston.

HOLEN, MICHAEL C., Assoc. Prof. and Head, Dept. of Administration and Foundations (1971, 1975, 1976). BA 1967, Stantord Univ.; MA 1968, PhD 1971, Univ. of Ore. (GF)

HORN, JERRY G., Asst. Dean and Prof. (1977). 8S 1961, MS 1964, Dkla. St. Univ.; EdD 1970, Univ. ot Colo. (GF)

HOYT, DONALD P., Dir. ot Dffice of Educational Research and Prof. (1968). BS 1948, Univ. ot Ill.; MA 1950, PhD 1954, Univ. ot Minn. (GF)

JAMES, ROBERT K., Prof. (1969, 1973, 1976). 8S 1959, Northwest Mo. St.; MA 1962, Univ. of Northern Iowa; PhD 1969, Univ. of Iowa. (GF)

JOHNSON, ROBERT L., Prot. and Asst. Dir., Personnel Services (Extension) (1965, 1977). BS 1951, Univ. ot Neb.; MS 1956, PhD 1958, Univ. of Wis. (GF)

JONES, EDWARD E., Asst. Prof. (1974). BA 1969, MS 1970, Wichita St. Univ.; EdD 1974, Dkla. St. Univ. (GF)

JORNS, WILLIAM J., Asst. Prot. and Asst. Dir., International Agricultural Programs (1971, 1977). 8S 1954, MS 196D, Kan. St. Univ.; EdD 1971, N.C. St. Univ. (GF)

KAISER, HERBERT EMIL, Assoc. Prot (1961, 1969). 8S 1941, Concordia Teachers Col.; MS 1943, Dkla. St. Univ.; PhD 1959, Univ. of Neb. (GF)

KATER, CLIFFORD, Instr. (1975). BA 1958, Southwestern Col., Wintield; MS 1975, Kan. St. Univ.

KEYS, SAMUEL R., Prof. (1969). A8 1948, Dlivet Col., Kankakee, Ill.; MA 1949, Univ. of Mo., Kansas City; PhD 1959, Univ. ot Minn. (GF)

KURTZ, VERNON RAY, Prot. (1970, 1971, 1976). BS 1955, MS 1959, Ft. Hays St. Univ.; EdD 1967, Univ. ot Neb. (GF)

LITTRELL, J. HARVEY, Prot. (1954, 1966). BA 1935, Iowa St. Teachers Col.; MA 1939, St. Univ. of Iowa; EdD 1950, Univ. ot Mo. (GF)

LITZ, CHARLES E., Assoc. Prof. (1971, 1975). BA 1963, Dhio Univ.; MA 1967, PhD 1970, Univ. of Mich. (GF)

LOEB, JOE HENRY, Asst. Prot. (1956). BA 1948, Northeastern St. Col.; MS 1951, Pittsburg St. Univ.; EdD 1957, Univ. ot Ark. (GF)

LYNCH, MICHAEL L., Assoc. Prof., Center for Student Development (1972). BS 1967, MS 1968, EdD 1972, Ind. Univ. (GF)

MAERTENS, NORBERT W., Prof. and Head, Department of Curriculum and Instruction (1974). BS 195B, Mankato St. Col.; MA 1960, PhD 1967, Univ. of Minn. (GF)

MARTIN, WILLIAM, Asst. Prof. (1975). BA 1966, Hobart Col.; MA 1967, Columbia Univ.; PhD 1975, Mich. St. Univ.

McANARNEY, HARRY EDWARD, Assoc. Prot. (1957, 1966). BS 1943, Emporia St. Univ.; MS 1947, EdD 1958, Univ. ot Kan. (GF)

McCAIN, JAMES ALLEN, President Emeritus (1950). Prof. of Higher Education (1970). AB 1926, LLD 1951, Wofford Col.; MA 1929, Duke Univ.; EdD 1948, Stanford Univ.; LLD 1965, Mont. St. Univ.; LLD 1965, Colo. St. Univ.; DSc 1967, Andhra Pradesh St. Univ. (India). (GF)

McILVAINE, JOSEPH, Asst. Prot. (1970). BS 1961, Pa. St. Univ.; MSH 1967, Central Mo. St. Univ.; PhD 197D, Dhio Univ. (GF)

McKINNEY, KATHERYN ANN, Assoc. Prof. ot Health, Phys. Ed. and Rec. (1946, 1972). 8S 1934, Kan. St. Univ.; MA 1935, George Peabody Col. tor Teachers.

MEISNER, ROBERT G., Prof. (1969, 1972). BS 1948, Dkla. A & M Col.; MS 1957, Dkla. St. Univ.; EdD 1967, Univ. of Calit., Berkeley. (GF)

MOGGIE, MAURICE CHARLES, Prof. of Education Emeritus (1930, 1945, 1973). BS 1929, MS 1931, Kan. St. Univ.; PhD 1941, Dhio St. Univ. (GF)

NEELY, MARGERY A., Assoc. Prot. (1974). AB 1955, Southwest Mo St. Univ.; MEd 1968, PhD 1971, Univ. of Mo., Columbia. (GF)

NELSON, WILLARD J., Instr. (1971). AA 1952, Luther Jr. Col.; BA 1954, Bethany Col.

NEWHOUSE, BARBARA, Instr., (1974). BS 1967, Western Mich. Univ.; MA 1973, Kan. St. Univ.

NEWHOUSE, ROBERT C., Assoc. Prof. (1972, 1976). BS 1967, MA 1969, Western Mich. Univ.; PhD 1972, Univ. ot Dre (GF)

NOLTING, EARL, Assoc. Prot. of Education and Dir., Center tor Student Development (1974). BS 1959, MS 1961, Ind. Univ.; PhD 1967, Univ. ot Minn. (GF)

OAKLIEF, CHARLES R., Assoc. Prof. (1974). BS 1959, MS 1962, Dhio St. Univ ; PhD 197D, Wis. St. Univ. and Dhio St. Univ (GF)

OHLSEN, ROBERT L., Assoc. Prot. (1976). BA 1952, Dttawa Univ.; ME 1957, Wichita Univ.; EdD 1963, Univ. of Kan. (GF)

OLSON, GEORGE ARTHUR, Prot. ot Education Emeritus (1949, 1969). AB 1928, AM 1931, Univ. ot Kan.; PhD 1953, Northwestern Univ. (GF)

OWENS, RICHARD E., Prof. and Dir., Dffice ot Educational Improvement and Innovation (1964, 1969, 1974). AB and BS 1949, Northwest Mo. St. Col.; MA 1953, EdD 1964, Univ. ot Northern Colo. (GF)

PARISH, THOMAS S., Assoc. Prof. (1976). 8A 1968, Northern Ill. Univ.; MA 1969, Ill. St. Univ.; PhD 1972, Univ. of Ill. (GF)

PARSONS, GERALD E., Prof. (1977). 8S 1952, MS 1959, PhD 1970, Iowa St. Univ. (GF)

PERL, MICHAEL F., Asst. Prof. (1976). BA 1966, St. Mary's Col. (Minn.); MS 197D, Winona St. Col. (Minn.); PhD 1976, Univ. of S.C.

PHILLIPS, CATHERINE, Asst. Prof. (1977). AA 1970, City Col. of San Francisco; BA 1973, MA 1974, San Francisco St. Univ.; PhD 1977, Arlz. St. Univ.

PRAWL, WARREN L., Prof.; Extension Specialist, Staff Development (1952, 1969). BS 1954, Kan. St. Univ.; MS 195B, EdD 1962, Cornell Univ. (GF)

PRICE, FLOYD HAMILTON, Prof. and Asst. Head, Dept. of Curriculum and Instruction (1963, 1965, 197D, 1976). A8 1951, Friends Univ.; MEd 1957, Wichita St. Univ.; EdS 1960, George Peabody Col.; EdD 1965, Univ. of Dkla. (GF)

READENCE, JOHN E., Asst. Prof. (1976). BA 1969, Cleveland St. Univ.; MA 1971, Dhio St. Univ.; PhD 1975, Arlz. St. Univ. (GF)

ROMERO, CHRISTIAN, Asst. Prot. (1975). 8S 1965, Col. of Santa Fe; MST 197D, N.M. Inst. of Tech.; EdD 1973, Dkla. St. Univ.

ROSENBLATT, RONALD, Asst. Prof. (1977). BA 1969, Columbia, Col. of Columbia Univ.; MA 1974, Teachers Col. of Columbia Univ.; PhD 1977, Univ. of Idaho.

SCHELL, LEO M., Prof. (1966, 1969, 1973). AB 1955, Bethany Col.; MS 1962, Univ. of Kan.; PhD 1964, Univ. of Iowa. (GF)

SCOTT, ROBERT, Prof. (197D, 1973). AA 1951, Independence, Kan., Jr. Col.; BS 1953, MS 1956, Kan. St. Teachers Col.; EdD 1965, Univ. of Mo. (GF)

SHERRARD, PETER, Asst. Prof., Counseling Center (1973). BA 1961, Wheaton College; MDiv 1967, THM 1971, Princeton Theological Seminary; ED 1973, Univ. ot Mass.

SHOOP, ROBERT J., Asst. Prof. (1976). BA 196B, MDiv 1972, Wittenberg Univ.; PhD 1974, Univ. ot Mich. (GF)

SMETHERS, HOWARD DEWIGHT, Asst. Prof. of Education Emeritus (1947, 1972). BS 1927, Emporia St. Univ., MS 1935, Kan. St. Univ.

SPARKMAN, WILLIAM, Asst. Prof. (1975). BA 1969, MEd 1973, PhD 1975, Univ. ot Fla. (GF)

STANIUS, VIOA E., Asst. Dean and Asst. Prot. (1975). BA 1965, McMaster Univ.; MS 1969, Fla. St. Univ.; PhD 1975, Univ. of Wis., Madison.

STEFFEN, JOHN D., Asst. Prot., Div. of Cont. Ed. (1967). BA 1956, Hamline Univ.; PhD 1968, Univ. ot Minn. (GF)

STEWART, G. KENT, Assoc. Prot. (1973, 1976). BS 1955, Ind. St. Univ.; MEd 1958, Univ. of Ill.; EdD 1964, Ind. Univ. (GF)

TEAGUE, FREO A., Prot. (1966, 1972, 1976). BS 1959, Central St. Col., Edmond, Dkla.; EdM 1963, EdD 1966, Univ. ot Dkla (GF)

TERRASS, JOYCE J., Prot. (1973, 1976). BS 1942, Kan. St. Univ.; MS 1957, Colo. St. Univ.; PhD 1969, Purdue Univ. (GF)

TREADWAY, KATHRYN, Asst. Prot. (1975). BS 1971, MS 1973, EdD 1975, Dkla. St. Univ.

TRENNEPOHL, HARLAN JEAN, Assoc. Prot. (1956, 1963). 8S 1947, MS 1951, Emporia St. Univ.; EdD 1956, Univ. of Colo. (GF)

URBANSOK, CAROLE, Asst. Prof. (1975). BA 1971, Wittenberg Univ.; MA 1973, PhD 1975, Univ. ot Toledo. (GF)

UTSEY, JORDAN, Prot. and Dean ot Col. of Education (1969, 1973, 1974, 1976). BA 1952, Col. ot Idaho; MEd 1958, EdD 1963, Univ. ot Dre. (GF)

VALLANCE, ELIZABETH J., Asst. Prot. and Administrator, Intersession and Summer School (1977). BA 1968, Univ. of Mich.; MA 1973, PhD 1975, Stanford Univ.

VAN METER, EDDY J., Assoc. Prof. (1971). BA 1968, Univ. ot N M.; MA 1969, EdD 1971, N.M. St. Univ. (GF)

VICKER, RICHARD L., Asst. Prof. (1976). BS 1965, MS 1967, MSLS 1970, Univ of Wis., Madison; PhD 1974, Univ. of Iowa.

WAUTHIER, RAYMOND AUGUST, Assoc. Prot. of Physical Education (1949). BS 1945, Albion Col.; MS 1947, Drake Univ. (GF)

WEIMER, RITA J., Asst. Prof. (1966, 1974). BS 1956, Pittsburg St. Univ.; MS 1964, EdD 1974, Univ. ot Kan. (GF)

WELTON, RICHARD F., Assoc. Prof. (1977). BS 1959, MS 1966, Colo. St. Univ.; PhD 1971, Dhio St. Univ. (GF)

WIEBE, DWIGHT M., Asst. Prof. and Coord., Dual Degree Program (1977). BA 1951, Taylor Univ.; MS 1954, Purdue Univ.; PhD 1977, Kan. St. Univ.

WILSON, ALFRED P., Prot. (1972, 1975). BS 1961, MEd 1965, EdD 1969, Utah St. Univ (GF)

WISSMAN, JANICE R., Instr. (1968). BS 1963, MS 1968, Kan. St. Univ.

ZABEL, ROBERT, Asst. Prot. (1977). 8A 1969, Grinnel Col.; MEd 1973, National Col. ot Ed.; PhD 1977, Univ. ot Minn.

College of Engineering

AHMED, NASIR, Prof. ot Electrical Engineering (1968, 1976). BS 1961, Univ. Col. ot Engineering, Bangalore, India; MS 1963, PhD 1966, Univ. of N.M. (GF)

AKINC, MUFIT, Asst. Prof. of Chemical Engineering (1977). BS 197D, MS 1973, METU, Turkey; PhD 1977, Iowa St. Univ.

AKINS, RICHARD GLENN, Prof. of Chemical Engineering (1963, 1973). BS 1957, MS 1958, Univ. ot Louisville; PhD 1962, Northwestern Univ. (GF)

ANNIS, JASON CARL, Assoc. Prot. ot Mechanical Engineering; Staff Assoc., Institute tor Environmental Research (1959, 1969, 1974). BS 1953, Univ. ot Minn.; MS 1956, Mich. Tech. Univ., PhD 1969, Kan. St. Univ. (GF)

APPL, FREDRIC CARL, Prot. ot Mechanical Engineering (196D, 1964). BS 1954, MS 1955, PhD 1958, Carnegie Mellon Univ. (GF)

AZER, NAIM ZAKI, Prof. ot Mechanical Engineering; Assoc., Institute for Environmental Research (1958, 1964, 1972). BS 195D, MS 1954, Univ. ot Alexandria, Egypt; PhD 1959, Univ of Ill. (GF)

BALL, HERBERT DEAN, Asst. Prot. of Mechanical Engineering (1958, 1972). BS 1952, MS 1958, Univ. of Neb.; PhD 1972, Kan. St. Univ. (GF)

BATES, HERBERT TEMPLETON, Prot. ot Chemical Engineering (1958, 196D). BS 1935, Iowa St. Univ.; MS 1938, Va. Polytechnic Inst.; PhD 1941, Iowa St. Univ. Professional Engineer, 1959. (GF)

BAUGHER, EARL EUGENE, Asst Prof of Agricultural Engineering (1967). 8S 1958, MS 1964, Kan St Univ

BENNETT, CORWIN A., Prof of Industrial Engineering, Assoc., Institute for Environmental Research (1970). 8S 1950, Iowa St Univ, MA 1951, PhD 1954, Univ of Neb; Certified Psychologist, N Y (GF)

BEST, CECIL HAMILTON, Prof of Civil Engineering (1961, 1964) 8S 1955, MS 1956, PhD 1960, Univ. of Calif Professional Engineer, 1962. (GF)

BISSEY, CHARLES R., Assoc Prof of Construction Science (1969). 8S 1957, Colo St. Univ., MArch 1961, Kan St Univ (GF)

BLACKMAN, MERRILL, Assoc Prof of Construction Science (1965, 1969). 8S in AE 1949, Kan. St Univ Registered Architect. 1955 Professional Engineer. 1949

BRAINARD, BOYD BERTRAND, Prof of Mechanical Engineering Emeritus (1923, 1938, 1967). 8S 1922, Univ of Colo. SM 1931, Mass. Inst of Technology Professional Engineer, 1945.

BURTON, CHARLES L., Asst Prof of Architectural Engineering (1970) 8S 1963, Kan. St. Univ; MS 1975, Kan Univ Professional Engineer, Kansas

BUSSEY, LYNN E., Assoc Prof of Industrial Engineering (1971). 8S 1947, Cornell Univ, MS 1969, PhD 1970, Okla St. Univ Professional Engineer, 194B. (GF)

BYERS, EARLE CONRAD, Asst. Prof of Industrial Engineering (1946, 1956). A8 1941, Greenville Col., MS 1954 Kan. St. Univ

CASEY, KENDALL FRANCIS, JR., Prof. of Electrical Engineering (1970, 1973). 8S 1961, Calif Inst of Technology MS 1962, PhD 1965, Univ of Southern Calif (GF)

CHUNG, OO SUP, Prof. of Agricultural Engineering (1965, 1977). 8S 1958, Purdue Univ., MS 1960, PhD 1965, Kan St Univ (GF)

CLACK, ROBERT WYNANOUS, Adjunct Prof. of Nuclear Engineering (1955, 1962). BS 1943, U.S. Naval Academy Professional Engineer. 1956.

CLARK, STANLEY JOE, Prof. of Agricultural Engineering; Ag Exp. Sta. (1966, 1976). BS 1954, MS 1959, Kan St Univ, PhD 1966, Purdue Univ Professional Engineer, 1969 (GF)

CLIFTON, JOHN PAUL, Assoc. Prof. of Industrial Engineering Emeritus (1947, 1956, 1971). BS 1929, Univ of Kan, MS 1956, Kan. St Univ Professional Engineer, 1956. (GF)

CONVERSE, HARRY H., Adjunct Assoc. Prof. of Agricultural Engineering (1966) 8S 1946, MS 1947, Kan. St. Univ U S.D A Grain Marketing Research Center

COOPER, PETER B., Prof of Civil Engineering (1966, 1974). BS 1957, MS 1960, PhD 1965, Lehigh Univ Professional Engineer, 1969 (GF)

COTTOM, MELVIN CLYDE, Asst. Prof. of Electrical Engineering (1955). BS 1945, MS 1948, Univ of Kan Professional Engineer in Kan, 1947, in Mo. 1952. (GF)

CRANK, ROBERT EUGENE, Prof. of Mechanical Engineering (1947, 1969, 1976). BS 1947, MS 1950, Kan St Univ Professional Engineer, 1949 (GF)

CRARY, JAMES FREO, Asst Prof. of Civil Engineering (1947, 1952). 8S 1947, Kan. St. Univ, MS 1969, Okla St Univ Professional Engineer, 1948

CRAWFORD, WILLIAM WESLEY, Assoc. Prof of Civil Engineering Emeritus (1923, 1942, 1949). B0i 1903, MDi 19D5, Iowa St Teachers Col. A8 1912. 8S 1917, Iowa St Univ.

DAHL, ROBERT E., Asst Prof of Architectural Engineering (1976). 8S 1951, MS 1954, Kan. St. Univ Professional Engineer.

DOLLAR, JOHN PAUL, Instr, Asst Dean (1960, 1975, 1976) BS 1956, MS 1966, Kan. St. Univ

DONNERT, HERMANN JAKOB ANTON, Prof. of Nuclear Engineering (1966, 1969). PhD 1951, Leopold-Franzens Univ, Austria (GF)

DUNCAN, ALLEY H., Prof of Mechanical Engineering (1942, 1952). BS 1937, MS 1949, Kan. St Univ Professional Engineer, 194B (GF)

DURLAND, MERRILL AUGUSTUS, Dean and Dir. Emeritus; Prof of Mechanical Engineering Emeritus (1919, 1961, 1967). 8S 1918, MS 1923. Kan St Univ Professional Engineer, 1935.

ECKHOFF, N. DEAN, Prof.; Head, Department of Nuclear Engineering; Dir. of Neutron Activation Analysis Laboratory, Dir. of Center for Energy Studies (1961, 1969, 1973, 1977). 8S 1961, MS 1963, PhD 1968, Kan. St. Univ (GF)

ERICKSON, LARRY EUGENE, Prof. of Chemical Engineering (1964, 1972). BS 1960, PhD 1964, Kan St Univ (GF)

FAIRBANKS, GUSTAVE EDMUND, Prof. of Agricultural Engineering; Ag Exp Sta (1941, 1957) BS 1941, MS 195D, Kan St. Univ Professional Engineer, 1948 (GF)

FAN, LIANG-TSENG, Prof, Head, Department of Chemical Engineering; Dir., Institute for Systems Design and Optimization, Assoc., Institute for Environmental Research (195B, 1967, 196B). 8S 1951, National Taiwan Univ., MS 1954, Kan. St. Univ., MS 1958, PhD 1957, West Va Univ (GF)

FAW, RICHARD EARL, Prof of Nuclear Engineering; Dir of Nuclear Reactor Facility (1962, 1966, 1968, 1976). BS 1959, Univ. of Cincinnati; PhD 1962, Univ of Minn. Professional Engineer, 1970. (GF)

FENTON, FREDERICK CHARLES, Prof. of Agricultural Engineering Emeritus; Ag Exp. Sta (192B. 1961). BS 1914, MS 1930, Iowa St. Univ Professional Engineer, 1947.

FLINNER, ARTHUR ORAN, Prof. of Mechanical Engineering Emeritus (1929, 1973). BS 1929, MS 1934, Kan. St. Univ.; SM 1937, Mass. Inst. of Technology Professional Engineer, 1937. (GF)

GALLAGHER, RICHARD RAY, Assoc. Prof of Electrical Engineering, Assoc., Institute for Environmental Research (196B, 1973). BS 1964, MS 1966, PhD 1968, Iowa St Univ. (GF)

GARTUNG, JIMMIE L., Instr. in Agricultural Engineering (1976). BS 1971, MS 1973, Kan. St. Univ., Irrigation Engineer, Kansas River Valley Experiment Station.

GEROIS, THOMAS A., Instr.; Engineering News Editor (1970). 8A 1963, Evangel Col.; MS 1970, Kan. St. Univ

GOODARD, JAMES F., Asst. Prof. of Construction Science (1972). BS8C 1969, Kan. St Univ; MS 1972, Univ of Fla.

GOODMAN, ALLAN P., Instr. in Construction Science (1977). BArch 1967, Kan. St. Univ.; Registered Architect, Kansas, 197D.

GORTON, ROBERT LESTER, Prof. of Mechanical Engineering; Assoc., Institute for Environmental Research (196D, 1974). BS 1953, La. Polytechnic Inst., MS 1960, La. St. Univ.; PhD 1966, Kan. St. Univ Professional Engineer, 1953. (GF)

GOWDY, KENNETH KING, Assoc Prof.; Head, Engineering Technology (1957, 1969, 1975). BS 1955, MS 1961, Kan. St Univ.; PhD 1965, Okla St. Univ (GF)

GROSH, DORIS LLOYD, Assoc Prof. of Industrial Engineering (1965, 1968, 1975). 8S 1946, Univ of Chicago; MS 1949, PhD 1969, Kan. St. Univ. (GF)

GROSH, LOUIS E., Assoc. Prof. of Industrial Engineering (1965, 1966). BS 1944, La. St. Univ.; BS 1947, MS 1949, PhD 1954, Purdue Univ. (GF)

HAFT, EVERETT EUGENE, Prof of Electrical Engineering (1961) BS 1947, MS 1951, PhD 1955, Univ. of Wis Professional Engineer in Wis., 1952. (GF)

HALL, RAYMOND CLARENCE, Asst. Prof. of Chemical Engineering (1950, 1952). 8S 1941, Iowa St. Univ., MS 1951, Kan. St. Univ (GF)

HANSEN, CARL ULLMAN, Asst. Prof. of Industrial Engineering Emeritus (1957, 1962, 1976). 8S 1936, Kan. St Univ.; MS 1961, Univ of Neb. Professional Engineer, 1961.

HARRIS, FLOYD WAYNE, Assoc. Prof. of Electrical Engineering (1965, 1969). 8S 1956, Univ. of Okla., MS 1962, PhD 1965, Okla. St. Univ (GF)

HAY, DeLYNN ROONEY, Asst. Prof. of Extension Agricultural Engineering (1971). 8S 1966, MS 1967, Univ of Neb.

HAYDEN, MYRON LEWIS, Asst. Prof. of Civil Engineering (1977). 8S 1974, Tri-State Col., Ind.; MS 1975, PhD 1977, Okla. St Univ

HEARN, NORVAL KELLY, JR., Instr. in Electrical Engineering (1969). 8A 1957, Kan St. Teachers Col.; MS 1966, Kan. St. Univ.

HELANDER, LINN, Prof. of Mechanical Engineering Emeritus (1935, 1961). BS 1915, Univ. of Ill. Professional Engineer, 1941.

HIGHTOWER, RAY E., Asst. Prof. of Nuclear Engineering; Asst to the Dean (1961, 1969, 1976). 8S 1964, Kan St. Univ

HOBSON, LELAND STANFORD, Prof. of Mechanical Engineering Emeritus (1946, 1968, 1972). 8S 1927, Kan St. Univ. Professional Engineer, 1946.

HOOGES, TEDDY OMAR, Prof. of Agricultural Engineering, Ag. Exp Sta., Assoc. Dean of Engineering; Dir., Engineering Experiment Station (1959, 1974). BS 1950, Tex. A & M, MS 1951, Iowa St. Univ; PhD 1959, Mich St. Univ Professional Engineer in Iowa, 1952; Professional Engineer, 1974. (GF)

HOLMES, ELWYN SPRUIELL, Prof. of Extension Agricultural Engineering (1966, 1975). 8S 1943, MS 1953, Tex A & M Univ.

HONSTEAD, WILLIAM HENRY, Prof. of Chemical Engineering, Dir., Kansas Industrial Extension Service; Executive Vice Pres. Kan. St. Univ. Research Foundation (1943, 197D, 1972). BS 1939, MS 1946, Kan. St. Univ., PhD 1956, Iowa St. Univ. Professional Engineer, 194B. (GF)

HOSTETTER, ABRAM ELDREO, Prof. of Industrial Engineering Emeritus (1931, 1952, 1969). BS 1925, McPherson Col.; MS 1932, PhD 193B, Kan. St. Univ

HU, KUO-KUANG, Assoc Prof. of Civil Engineering (1968, 1969, 1975). Graduation, 1956, Taiwan Provincial Taipei Inst. of Tech.; MS 1966, PhD 1969, Kan. St. Univ. (GF)

HUANG, CHI-LUNG, Prof. of Mechanical Engineering (1964, 1974). 8S 1954, National Taiwan Univ., MS 1960, Univ of Ill.; Doctor of Engineering 1964, Yale Univ. (GF)

HUMMELS, DONALD RAY, Assoc. Prof. of Electrical Engineering (1970, 1974). BS 1967, MS 1968, PhD 1969, Ariz St. Univ. (GF)

HUNT, ORVILLE DON, Prof. of Electrical Engineering Emeritus (1923, 1947, 197D). BS 1923, Wash St Univ., MS 193D, Kan. St Univ Professional Engineer, 1947.

HWANG, CHING-LAI, Prof. of Industrial Engineering, Assoc., Institute for Enviromental Research (1964, 1967, 1973). BS 1953, National Taiwan Univ.; MS 1960, PhD 1962, Kan. St. Univ (GF)

JEPSEN, RICHARD LOUIS, Assoc. Prof. of Extension Agricultural Engineering (1963, 1975). BS 195D, MS 1963, Kan. St. Univ., PhD 1974, N.C. St. Univ

JOHNSON, GARY LEE, Assoc. Prof. of Electrical Engineering (1966, 1973). 8S 1961, MS 1963, Kan St. Univ., PhD 1966, Okla. St Univ. Professional Engineer, 1973. (GF)

JOHNSON, WILLIAM H., Prof.; Head, Department of Agricultural Engineering (1970). BS Agriculture, BS Agricultural Engineering 194B, MS 1953, Ohio St. Univ.; PhD 1960, Mich. St. Univ. Professional Engineer in Ohio, 1970. (GF)

KERCHNER, RUSSELL MARION, Prof. of Electrical Engineering Emeritus (1922, 1934, 1965). BS 1922. Univ of Ill., MS 1927, Kan. St. Univ Professional Engineer, 1945.

KIPP, JOHN EDWARD, Assoc. Prof. of Mechanical Engineering; Assoc., Institute for Environmental Research (1959, 1969). BS 1951, MS 1955, Univ of Kan.; PhD 196B, Okla. St. Univ. Professional Engineer, 1960. (GF)

KIRMSER, PHILIP GEORGE, Prof. of Mathematics; Prof. of Engineering (1942, 195B, 1962). BS 1939, MS 1944, PhD 1958, Univ of Minn. Professional Engineer, 1961. (GF)

KNOSTMAN, HARRY DANIEL, Assoc. Prof. of Civil Engineering (1957, 1973). BS 1955, MS 1961, Kan. St. Univ., PhD 1965, Univ. of Colo. Professional Engineer, 1959. (GF)

KOEPSEL, WELLINGTON WESLEY, Prof. of Electrical Engineering (1964, 1976). BS 1944, MS 1951, Univ. of Tex, PhD 1960, Okla St. Univ. Professional Engineer in Tex., 1952. Professional Engineer in Kan., 1974 (GF)

KONZ, STEPHAN ANTHONY, Prof. of Industrial Engineering; Assoc., Institute for Environmental Research (1964, 1969). BS 1956, MBA 1956, Univ. of Mich., MS 196D, St. Univ. of Iowa; PhD 1964, Univ. of Ill. (GF)

KUHLMAN, DENNIS K., Asst Prof. of Extension Agricultural Engineering (1976). BS 1970, MS 1975, Kan. St. Univ

KYLE, BENJAMIN GAYLE, Prof. of Chemical Engineering (195B, 1964). BS 195D, Ga. Inst. of Tech., MS 1955, PhD 195B, Univ. of Fla. (GF)

LAI, FANG-SHYONG, Adjunct Prof. of Chemical Engineering (1975). BS 1965, National Taiwan Univ., MS 1966, Univ of Notre Dame; PhD 1974, Kan. St. Univ. (GF)

LARSON, GEORGE HERBERT, Prof. of Agricultural Engineering; Ag. Exp. Sta (1939, 195D). BS 1939, MS 1940, Kan St. Univ., PhD 1955, Mich. St. Univ Professional Engineer, 1947. (GF)

LEE, E. STANLEY, Prof. of Industrial Engineering (1966, 1970). BS 1953, Ordnance Engineering Col., China, MS 1957, N.C. St. Col.; PhD 1962, Princeton Univ. (GF)

LENHERT, DONALD HOWARD, Assoc. Prof. of Electrical Engineering (1966, 1969). BS 1956, Kan. St Univ, MS 1958, Syracuse Univ.; PhD 1966, Univ. of N.M.; Professional Engineer, 1973 (GF)

LESTER, THOMAS W., Asst. Prof. of Nuclear Engineering (1974). BS 197D, MS 1972, PhD 1974, Purdue Univ. (GF)

LINDHOLM, JOHN C., Prof. of Mechanical Engineering (196D, 1974). BS 1949, Kan. St. Univ.; MS 1957, Univ of Kan.; PhD 1961, Purdue Univ Professional Engineer, 1954. (GF)

LINDLY, EDWIN CURGUS, Assoc. Prof. of Civil Engineering (1949, 1965). BS 1942, Okla St. Univ, MS 1949, Purdue Univ.; MS 1957, Kan. St. Univ.; PhD 1964, Iowa St. Univ Professional Engineer, 1950. (GF)

LIPPER, RALPH IDEN, Prof. of Agricultural Engineering, Ag. Exp. Sta (1964, 1972). BS 1941, MS 195D, Kan. St. Univ Professional Engineer, 1953 (GF)

LUCAS, MICHAEL S.P., Prof. of Electrical Engineering (1968, 1970). MS 1962, PhD 1964, Duke Univ (GF)

MANGES, HARRY LEO, Prof. of Agricultural Engineering; Ag. Exp. Sta. (1956, 1963, 1977). BS 1949, MS 1959, Kan. St. Univ.; PhD 1969, Okla. St. Univ. Professional Engineer, 1960. (GF)

MATTHEWS, JOHN CARTER, Assoc. Prof. of Chemical Engineering (1962). 8S 1959, DSc 1965, Wash Univ. (GF)

McCORMICK, FRANK JAMES, Prof. of Civil Engineering Emeritus (1939, 1947, 1976). BS 1927, MS 1931, Iowa St. Univ. Professional Engineer, 1944. (GF)

MERKLIN, JOSEPH FREDERICK, Assoc. Prof. of Nuclear Engineering (1967, 197D). BS 1957, Manhattan Col. of N Y.; PhD 1963, Univ. of Minn. (GF)

MESSENHEIMER, ALVA ERNEST, Assoc. Prof. of Mechanical Engineering Emeritus (1942, 1963, 1971). BS 1924, Kan. St. Univ Professional Engineer, 194B

MILLER, PAUL LEROY, Prof.; Head, Department of Mechanical Engineering; Assoc., Institute for Environmental Research (1958, 1972, 1975). BS 1957, MS 1961, Kan. St. Univ.; PhD 1966, Okla. St. Univ. Professional Engineer, 1962. (GF)

MINGLE, JOHN ORVILLE, Prof. of Nuclear Engineering; Dir., Institute for Computational Research in Engineering; Black and Veatch Professor (1956, 1965, 1974). BS 1953, MS 1958, Kan. St. Univ.; PhD 196D, Northwestern Univ. Professional Engineer, 1961. (GF)

MORSE, REEO FRANKLIN, Prof. of Civil Engineering Emeritus (1923, 1945, 1968). BA 1921, Cornell Col.; BS 1923, Iowa St. Univ.; MS 1933, Kan. St. Univ.; PhD 1941, Cornell Univ Professional Engineer, 1939.

MUNGER, HAROLO HAWLEY, Assoc. Prof. of Applied Mechanics Emeritus (1939, 1954, 1961). BS 1939, MS 1941, Kan. St. Univ. Professional Engineer, 1941.

MURPHY, JAMES PATRICK, Asst. Prof. of Extension Agricultural Engineering (1971). BS 1968, MS 1970, Kan. St. Univ

MUSTERMAN, JOHN L., Asst. Prof. of Civil Engineering (1975). BS 1970, Univ. of Dayton, MS 1972, PhD 1975, Univ. of Cincinnati. (GF)

NELSON, CLARENCE LESLIE, Instr. in Industrial Engineering Emeritus (1943, 1972).

NESMITH, OWIGHT ALVIN, Assoc. Prof. of Mechanical Engineering; Dir., Engineering Co-op Program; Dir. Engineering Minority Program (1948, 195B, 1974, 1975). BS 1948, Northwestern Univ., MS 1952, Kan. St. Univ. Professional Engineer, 1962.

PAULI, ROSS IRWIN, Asst. Prof. of Mechanical Engineering (1947, 1954). 8A 1941, Westmar Col.; MS 1947, Pittsburg St. Univ.

POWELL, G. MORGAN, Asst. Prof., Natural Resource Engineer, Extension Agricultural Engineering (1977). BS 1965, Kan. St. Univ.; MS 1967, Univ of Mo.; PhD 1973, Utah St. Univ

RATHBONE, OONALO E., Dean; Prof. of Electrical Engineering (1973). BS 1951, Purdue Univ.; MS 1956, Northwestern Univ.; PhD 1962, Univ. of Pittsburgh. (GF)

ROGERS, DANNY H., Asst. Prof.; Irrigation Engineer, Extension Agricultural Engineering (1977). BS 1976, MS 1977, Kan. St. Univ

ROHLES, FREOERICK HENRY, JR., Prof. of Psychology; Dir., Institute for Environmental Research (1963, 1973). BS 1942, Roosevelt Univ.; MA 1949, PhD 1956, Univ. of Tex. (GF)

ROSEBRAUGH, VERNON HART, Prof. of Civil Engineering (1953, 1973). 8S 1933, Ore Inst. of Tech.; BS 1938, Ore. St. Univ ; MA 1952, Univ. of Portland; CE 1956, Dre. St. Univ Professional Engineer, 1954. (GF)

ROTH, THOMAS A., Assoc. Prof. of Chemical Engineering (1965, 1973). BS 1960, MS 1961, PhD 1967, Univ. of Wis. (GF)

RUSSELL, EUGENE R., Assoc. Prof. of Civil Engineering (1974). BSCE 1958, Univ of Mo., Rolla; MS 1965, Iowa St Univ.; PhD 1974, Purdue Univ. Professional Engineer, 1962. (GF)

SCHINDLER, DALE EUGENE, Assoc. Prof. of Extension Agricultural Engineering (1955, 1966). BArch 1953, MS 1960, Kan. St. Univ.

SCHMIO, LAWRENCE A., Assoc. Prof. of Civil Engineering (196B, 1972). BS 1962, MS 1963, Iowa St. Univ.; PhD 196B, Univ of Kan Professional Engineer, 1969. (GF)

SCHARPLAZ, JAMES D., Instr. of Agricultural Engineering (1975). 8S 1973, MS 1975, Kan. St. Univ.

SCHROCK, MARK OAVIO, Ext. Asst. of Extension Agricultural Engineering (1973). BS 1969, Kan. St. Univ.; MS 1971, Univ. of Ill.

SHULTIS, J. KENNETH, Assoc. Prof. of Nuclear Engineering (1969, 1974). BASc 1964, Univ. of Toronto; MS 1965, PhD 196B, Univ. of Mich. (GF)

SIMONS, GALE G., Assoc. Prof. of Nuclear Engineering (1977). 8S 1962, MS 1965, PhD 1969, Kan. St. Univ. (GF)

SINHA, SUBHASH C., Asst. Prof. of Mechanical Engineering (1977). BS 1968, Bihar Inst of Tech.; MS 1972, Indian Inst. of Sc.; PhD 1977, Wayne St. Univ.

SITZ, EARL LEROY, Prof. of Electrical Engineering Emeritus (1927, 1948, 1969). BS 1927, Iowa St. Univ.; MS 1932, Kan. St. Univ Professional Engineer, 1947.

SMALTZ, JACOB JAY, Prof. of Industrial Engineering (1939, 1952). BS 1939, Bradley Polytechnic Inst.; MS 1946, Kan. St. Univ Professional Engineer, 1960. Certified Safety Professional, 1973. (GF)

SMITH, BOB LEE, Prof. of Civil Engineering (1948, 1965). 8S 194B, MS 1953, Kan. St. Univ.; PhD 1963, Purdue Univ Professional Engineer, 1953. (GF)

SNELL, ROBERT ROSS, Prof.; Head, Civil Engineering (1957, 1968, 1972). BS 1954, MS 1960, Kan. St. Univ.; PhD 1963, Purdue Univ. Professional Engineer, 1959. (GF)

SPILLMAN, CHARLES KENNARO, Assoc. Prof. of Agricultural Engineering; Ag. Exp. Sta (1969, 1973). AS 1958, Vincennes Univ.; BS 1960, MS 1963, Univ. of Ill.; PhD 1968, Purdue Univ (GF)

STEVENSON, PAUL NELSON, Assoc. Prof. of Agricultural Engineering (1957). BS 1948, Univ. of Mo.; MS 1957, Iowa St. Univ. (GF)

SWARTZ, STUART ENOSLEY, Prof of Civil Engineering (1968, 1977). BS 1959, MS 1962, PhD 1968, Ill. Inst. of Tech. Professional Engineer, 197D. (GF)

TAYLOR, OELOS CLIFTON, Prof. of Applied Mechanics Emeritus (1931, 1956, 1970). 8S 1925, MS 1937, Kan. St. Univ. Professional Engineer, 1948.

TENEYCK, GEORGE ROBERT, Asst. Prof. of Agricultural Engineering, Superintendent, Sandyland Experiment Field (1964, 1970, 1972). BS 1951, MS 1970, Kan. St. Univ

THOMAS, JAMES G., Asst Prof.; Irrigation Engineer, Extension Agricultural Engineering (1976). BS 1975, MS 1977, Univ. of Ark.

THOMPSON, J. GARTH, Assoc. Prof. of Mechanical Engineering (1971). BS 196D, Brigham Young Univ.; MS 1962, PhD 1967, Purdue Univ (GF)

THORSON, I. EUGENE, Prof.; Head, Department of Architectural Engineering and Construction Science (1948, 1951, 1966). BS 1940, Univ. of Wash. Professional Engineer, Washington 1948, Kansas. (GF)

TILLMAN, FRANK AUBREY, Prof.; Head, Department of Industrial Engineering; Assoc. Dir., Institute for Systems Design and Optimization (1965, 1966, 1969). BS 196D, MS 1961, Univ. of Mo.; PhD 1965, St. Univ. of Iowa. (GF)

TRIPP, WILSON, Prof. of Mechanical Engineering Emeritus (1936, 1947, 1977). BS 1930, MS 1933, Univ. of Calif.; PhD 1956, Univ. of Ill. Professional Engineer, 1946. (GF)

TURNQUIST, RALPH OTTO, Prof. of Mechanical Engineering (1959, 1975). BS 1952, MS 1961, Kan. St. Univ.; PhD 1965, Case Inst. of Tech. (GF)

VAUGHAN, ARTHUR R., Assf Prof. of Engineering Technology (1977). BS 1967, MS 1971, Univ. of Wis.

WAKABAYASHI, ISAAC, Instr. in Electrical Engineering (1955). 8S 1954, Univ. of Calif.

WALAWENOER, WALTER P., Assoc. Prof. of Chemical Engineering (1969, 1975). BA 1963, Utica Col. of Syracuse Univ.; MS 1967, PhD 1969, Syracuse Univ. (GF)

WALKER, OUANE ELOON, Instr. in Engineering Technology (197D). BS 1961, MS 1962, Kan. St Univ.

WALKER, HUGH SANDERS, Prof. ot Mechanical Engineering, Assoc. Dir., Institute for Computational Research in Engineering (1964, 1968, 1976). BS 1957, MS 196D, La. St. Univ ; PhD 1965, Kan. St. Univ Professional Engineer, Kansas 1975, Louisiana 1958 (GF)

WARD, JOSEPH EVANS, JR., Prof. of Electrical Engineering (1940, 1961). 8S 1937, The Univ. ot Tex.; MS 1940, Univ. of Ill. Professional Engineer, 1948 (GF)

WENOLING, LEO THEODORE, Prof. of Extension Agricultural Engineering (1947, 1965). State Leader 1969; 8S 1947, MS 1956, Kan. St. Univ.

WILLIAMS, WAYNE WATSON, Prof. of Civil Engineering (1965, 1975). 8S 1951, MS 1953, Iowa St. Univ (GF)

WILSON, C. CARL, Assoc. Prof. of Industrial Engineering (1977). 8S 1959, Univ of Toronto; MS 1962, 1965, Univ. of Mich; Professional Engineer, 1960, Toronto

WOOO, JOE NATE, Prof. of Mechanical Engineering (1936, 1947). BS 1936, St. Univ. of Iowa Professional Engineer, 1948.

WOODARD, CLAUDE LOWELL, Assoc. Prof. of Chemical Engineering (1949, 1969). BS 1948, Kan. St. Univ ; MS 1961, PhD 1968, Univ. of Mo. (GF)

ZOVNE, JEROME J., Asst. Prof. of Civil Engineering (197D). BS 1965, MS 1966, Univ. of Wis.; PhD 1970, Ga. Inst. of Tech. Professional Engineer, 1972. (GF)

College of Home Economics

AGAN, ANNA TESSIE, Assoc. Prof. of Family Economics Emerita; Agr. Exp. Sta. (1929, 1944, 1968). BS 1927, Univ of Neb.; MS 1930, Kan. St. Univ (GF)

ANOERSON, JUDITH V., Asst. Prof., Foods and Nutrition (1977). BS 1967, MPH 1973, Univ. of N.C.

ANNIS, PATTY SMITH, Asst. Prof. of Family Economics; Agr. Exp. Sta. (1958, 1961). BS 1955, Miss. St Col for Women; MS 1957, Univ. of Tenn. (GF)

BAGAROZZI, OENNIS, Asst. Prof., Family and Child Development (1977). BS 1966, N.Y. Univ.; MSW 1968, City Univ. of N Y.; PhD 1976, Penn. St. Univ. (GF)

BARFOOT, OOROTHY, Prof. of Art Emerita (1930, 1962, 1966). BSA, St. Univ. of Iowa, MA 1928, Columbia Univ (GF)

BARNES, JANE WILSON, Asst Prof Emerita (1939, 1963). BS 1912, MS 1932, Kan. St. Univ. (GF)

BARNHART, NIKKI JANE, Instr. of Clothing, Textiles and Interior Design (1976). BS 1974, Univ. of Mo.; MA 1976, Univ. of Mo.

BERGEN, BETSY, Assoc. Prof. of Family and Child Development (1966, 1972, 1976). AB 1949, Ottawa Univ , MS 1964, PhD 1972, Kan St. Univ. (GF)

BOLLMAN, STEPHAN RAY, Prof. of Family and Child Development; Agr. Exp. Sta. (1966, 1969, 1975). 8S 1957, MS 1963, PhD 1966, Iowa St. Univ. (GF)

BOWERS, JANE RAYMONO, Prof.; Head, Department of Foods and Nutrition; Agr. Exp. Sta. (1966, 1974, 1976). BS 1962, MS 1963, PhD 1967, Kan St. Univ (GF)

BROCKMAN, HELEN L., Prof. of Clothing, Textiles and Interior Design Emerita (1967, 1973). BA 1926, Univ. of Iowa. (GF)

BROWNING, NINA M., Assoc. Prof. of Foods and Nutrition Emerita (193D, 1943, 1970). BS 1923, MS 1927, Kan. St. Univ. (GF)

CANTER, OEBORAH O., Asst. Prof., Dietetics, Restaurant and Institutional Management (1977). BS 1972, MS 1974, PhD 1977, Univ. of Tenn.

CAUL, JEAN FRANCES, Prof. of Foods and Nutrition, Agr Exp. Sta (1967). AB 1937, Lake Erie Col., MA 193B, PhD 1942, Ohio St. Univ. (GF)

CORMANY, ESTHER MARGARET, Assoc. Prof. of Clothing, Textiles and Interior Design Emerita; Agr. Exp. Sta. (1936, 1941, 1975). BS 1926, MS 1932, Kan. St. Univ. (GF)

CRAIGIE, BARBARA, Asst. Prof. of Clothing, Textiles and Interior Design Emerita (1954, 1963, 1975). BA 1932, Univ. of Minn.; MA 1942, Univ. of Mo. (GF)

CREWS, PATRICIA C., Instr., Clothing, Textiles and Interior Design (1977). BS 1971, Va. Poly & St. Univ.; MS 1973, Fla. St. Univ.

OAVIS, ALBERT J., Assoc. Prof. of Family and Child Development (1974). BS 1963, Fordham Univ.; MA 1964, Univ. of Conn.; PhD 1969, Pa. St. Univ. (GF)

FINKELSTEIN, BEATRICE, Prof. of Foods and Nutrition Emerita, Agr. Exp. Sta. (1967). BA 1933, Hunter Col., MS 1939, Columbia Univ. (GF)

FLASHMAN, ROBERT H., Asst. Prof. of Family Economics (1975). BS 1970, MS 1972, Kan. St Univ.; PhD 1976, Ohio St Univ.

FRYER, E. BETH, Prof. of Foods and Nutrition; Agr. Exp. Sta (1959, 1975). BS 1945, Univ. of N.M.; MS 1949, Ohio St. Univ.; PhD 1959, Mich. St. Univ. (GF)

GILROY, MARILYN P., Instr. of Dietetics, Restaurant and Institutional Management (1975). 8S 1962, Col. of St. Francis; MS 1966, St. Louis Univ.

HANNA, SHERMAN, Asst. Prof., Family Economics (1977). BS 1968, Mass. Inst. of Tech.; MS 1973, PhD 1974, Cornell Univ. (GF)

HARRISON, OOROTHY LUCILE, Prof. of Foods and Nutrition; Agr. Exp. Sta. (1947, 1963). 8S 193B, Dakota Wesleyan Univ.; MS 1943, PhD 1947, Iowa St. Univ. (GF)

HELVENSTON, SALLY, Instr. of Clothing, Textiles and Interior Design (1975). BME 197D, MS 1975, Fla. St. Univ.

HILL, OPAL BROWN, Assoc. Prof. of Clothing, Textiles and Interior Design Emerita (1944, 1954, 1969). BS 1944, MS 195D, Kan. St. Univ. (GF)

HIRSCH, MARTHA O., Instr. of Foods and Nutrition (1976). BS 1957, Cornell; MS 1968, Univ. of Kan.

HOEFLIN, RUTH, Dean; Prof. of Home Economics (1957, 1960, 1975). 8S 1940, Iowa St. Univ.; MA 1945, Univ. of Mich.; PhD 1950, Ohio St. Univ. (GF)

HOWE, HAZEL OELL, Assoc. Prof. of Clothing and Textiles Emerita (1936, 1947, 1967). BS 1921, MS 1935, Kan. St. Univ. (GF)

HUYCK, ELNDRA T., Prof., Head, Family and Child Development (1977). BS 194D, MS 1958, Kan. St. Univ.; PhD 1971 Univ. of Minn. (GF)

IMIG, DAVID RICHARD, Asst. Prof. of Family and Child Development (1976). 8S 1964, MA 1969, PhD 1971. Mich St. Univ.

INGALSBE, NDALEEN G., Instr. of Dietetics, Restaurant and Institutional Management (1975). 8S 1969, Iowa St. Univ.

JURICH, ANTHONY P., Assoc. Prof. of Family and Child Development (1972, 1976). 8S 1969, Fordham Univ.; MS 1971, PhD 1972, Pa. St. Univ. (GF)

KELL, LEONE BOWER, Prof. of Family and Child Development Emerita; Agr. Exp. Sta. (1927, 1947, 1965). 8S 1923, MS 192B, Kan. St. Univ. (GF)

KENNEDY, CARRDLL E., Prof. of Family and Child Devolopment (197D). A8 1949, Wheaton Col.; MS 1953, Kan. St. Univ.; EdD 1963, Univ. of Md. (GF)

KRAMER, MARTHA MORRISDN, Prof. of Home Economics Emerita (1922, 196D). 8S 1916, Univ. of Chicago; MS 1919, PhD 1922, Columbia Univ. (GF)

KRUCKEBERG, VICKY, Instr. of Clothing, Textiles and Interior Design (1975). BS 1974, MS 1975, Southern Ill. Univ.

LARSON, SUSAN S.; Asst. Prof. of Family and Child Development Emerita (1955, 1956, 1962, 1974, 1978). 8S 194D, Univ. of Iowa; MS 1942, Univ. of Wis.

LIENKAEMPER, GERTRUDE ELISE, Assoc. Prof. of Clothing and Textiles Emerita (1941, 1948, 1966). 8S 1921, Dre. St. Col.; MS 193B, Univ. of Wash. (GF)

LINDAMOOD, SUZANNE, Asst. Prof., Family Economics (1977). 8S 196B, Carnegie-Mellon Univ.; MA 197D, PhD 1974, Cornell Univ.

McCORD, IVALEE HEDGE, Prof. of Family and Child Development Emerita (1957, 1963, 1966, 1977). BS 1933, MS 1951, Kan. St. Univ.; PhD 1964, Purdue Univ. (GF)

McMILLAN, EVA M., Assoc. Prof. of Foods and Nutrition Emerita (193D, 1937, 1939, 1958). MS 1918, PhD 1929, Univ. of Chicago. (GF)

McNEIL, JDAN N., Instr. of Family and Child Development (197D). BS 1951, Kan. St. Univ.; MS 1956, Univ. of Minn.

MORRISON, LAVDNNA, Instr. of Dietetics, Restaurant and Institutional Management (1976, 1977). BS 196D, Univ. of Id; MS 1976, Kan. St. Univ.

MDRSE, RICHARD L.D., Prof.; Head, Department of Family Economics; Agr. Exp. Sta. (1955). BA 193B, Univ. of Wis., PhD 1942, Iowa St. Univ. (GF)

MULLEN, IVA MANILLA, Asst. Prof. of Foods and Nutrition Emerita (1936, 1964). 8S 1925, Kan. St. Univ., MS 1928, Iowa St. Univ. (GF)

MUNSDN, DEANNA M., Instr. of Clothing, Textiles and Interior Design (1967). BS 1966, MS 1967, Kan. St. Univ.

NEWBY, FRANCES ANN, Asst. Prof. of Clothing, Textiles and Interior Design (1963, 1971). BFA 1961, Kan. City Art Inst.; MArch 197D, Kan. St. Univ.

NEWELL, KATHLEEN, Assoc. Prot. of Foods and Nutrition, Agr. Exp. Sta. (1962, 1975, 1977). 8S 1944, Kan. St. Univ.; MS 1951, Univ. of Wis.; PhD 1973, Univ. of Tenn. (GF)

DRDDNEZ, MARGARET THDMPSDN, Instr. of Clothing, Textiles and Interior Design (1976). BS 1961, MS 196B, Univ. of Tenn.

OWENS, SUSAN L., Instr. of Dietetics, Restaurant and Institutional Management (1975). BS 1970, MS 1975, Univ. of Tenn.

PENCE, KAREN T., Instr. of Home Economics (1977). BSE 1971, Emporia St. Univ.; MS 1972, Kan. St. Univ.

PETERSDN, MARY D., Asst. Prot., Acting Head of Clothing, Textiles and Interior Design (1968, 1975). 8S 195B, MS 1959, Univ. of Tenn.; EdD 1975, Dkla. St. Univ.

PHILLIPS, DORIS ELLEN, Asst. Prof. of Foods and Nutrition (1975). BS 197D, Purdue Univ.; MS 1973, PhD 1975, Univ. of Tenn. (GF)

PORESKY, RDBERT H., Assoc. Prof. of Family and Child Development (1972, 1977). AB 1963, MS 1967, PhD 1969, Cornell Univ. (GF)

PRESNAL, FAYE A., Instr. of Family and Child Development (1973). 8S 1966, MS 1973, Dkla. St. Univ.

RAFFINGTDN, MARGARET ELIZABETH, Asst. Prof. of Family and Child Development Emerita (193B, 1939, 1966, 1970). BS 1924, MS 1928, Kan. St. Univ.; Professional Diploma 1954, Columbia Univ.

RASMUSSEN, ALBIE C., Asst. Prot. of Family Economics (1966, 1967). 8S 1962, Univ. of Alaska; MS 1964, Kan. St. Univ.

REAGAN, BARBARA, Asst. Prof. of Clothing, Textiles and Interior Design (1976). BS 1968, Syracuse Univ.; MS 1972, PhD 1976, Purdue Univ. (GF)

REEVES, RDBERT D., Assoc. Prot., Foods and Nutrition (1977). BA 1964, MS 1965, Tex. Tech. Univ.; PhD 1971, Iowa St. Univ. (GF)

RDACH, FAITH RUSSELL, Asst. Prof. of Dietetics, Restaurant and Institutional Management (1965, 1973). BS 1947, MS 1966, PhD 1973, Kan. St. Univ. (GF)

RUSSELL, CANDYCE S., Asst. Prot. of Family and Child Development (1974). BS 196B, Cornell Univ.; MA 1972, PhD 1975, Univ. of Minn. (GF)

SCHEIDT, RICK JAMES, Asst. Prof. of Family and Child Development (1976). BA 1967, MA 1969, Calif. St. Univ.; PhD 1973, Univ. of Neb. (GF)

SEGD, R. JEAN, Asst. to Dean; Instr. of Home Economics (1967). BA 196D, Friends Univ.; MS 1967, Kan. St. Univ.

SETSER, CARDL S., Asst. Prof. of Foods and Nutrition (1976). BS 1962, Univ. of Mo.; MS 1964, Cornell; PhD 1971, Kan. St. Univ. (GF)

SHUGART, GRACE SEVERANCE, Prof. of Dietetics, Restaurant and Institutional Management Emerita; Agr. Exp. Sta. (1951, 1957, 1975). 8S 1931, Wash. St. Univ.; MS 193B, Iowa St. Univ. (GF)

SPEARS, MARIAN C., Prof.; Head, Department of Dietetics, Restaurant and Institutional Management (1975). BS 1942, MS 1947, Western Reserve Univ.; PhD 1971, Univ. of Mo. (GF)

STITH, MARJDRIE MAY, Prof. of Family and Child Development (1961, 1962, 1966, 1977). BS 1943, Ala. St. Col. for Women; MS 195B, PhD 1961, Fla. St. Univ. (GF)

STDLPER, JANE, Asst. Prot. of Clothing, Textiles and Interior Design (1975). BS 1947, MS 1967, PhD 1971, Univ. of Wis. (GF)

STDNE, MARTHA B., Asst. Prot., Foods and Nutrition (1977). 8S 1974, MS 1975, PhD 1977, Univ. of Tenn.

STREIT, LES D., Instr. of Home Economics (1974). BS 1970, MS 1973, Kan. St. Univ.

TINKLIN, GWENDOLYN LaVERNE, Prot. of Foods and Nutrition Emerita; Agr. Exp. Sta. (1943, 1956, 1975). BS 194D, MS 1944, Kan. St. Univ. (GF)

VADEN, ALLENE G., Assoc. Prof. of Dietetics, Restaurant and Institutional Management (1971, 1973, 1977). 8S 196D, Univ. of Tex.; MS 1967, Tex. Technological Col.; PhD 1973, Kan. St. Univ. (GF)

VARNEY, LAURA, Instr. of Clothing, Textiles and Interior Design (1975). BS 1954, MS 1975, Kan. St. Univ.

VILLASI, LUDWIG, Asst. Prof. of Clothing, Textiles and Interior Design (1975). 8S 1968, MS 1975, Wayne St. Univ. (GF)

WEST, BESSIE BROOKS, Prof. of Dietetics, Restaurant and Institutional Management Emerita (1928, 196D). AB 1924, Univ. of Calif.; MS 1951, Mich. St. Normal Col. (GF)

WEST, LOUELLEN, Instr., Family and Child Development (1977). 8S 1966, Harding Col.; MS 1968, Univ. of Ill.

WILLIAMS, JENNIE, Prof. of Family and Child Development Emerita (1932, 1959). BS 192D, MS 1933, Kan. St. Univ.; Graduate, 1925, Univ. of Mich. School of Nursing. (GF)

WDDDS, R. BRUCE, Instr. of Family and Child Development (1972). BA 1959, Wichita St. Univ.; MDiv 1962, Central Baptist Seminary; MS 1972, PhD 1977, Kan. St. Univ.

College of Veterinary Medicine

ANDERSDN, NEIL V., Prof. of Comparative Gastroenterology (1967, 1975). Clinical Research Scientist. Diplomate, American Col. of Veterinary Internal Medicine, 1972. 8S 1953, Mankato St. Col.; 8S 1959, DVM 1961, PhD 1968, Univ. of Minn. (GF)

ANTHONY, HARRY D., Prof. and Dir. of Diagnostic Lab. (1955, 1971). Research Pathologist. DVM 1952, MS 1957, Kan. St. Univ. (GF)

BAILIE, WAYNE E., Assoc. Prof. of Bacteriology (1972, 1975). Research Bacteriologist. BS 1957, DVM 1957, PhD 1969, Kan. St. Univ. (GF)

BAUGH, RDBERT C., Instr., Diagnostic Lab. (1965, 196B). BS 1962, DVM 1965, Kan. St. Univ.

BEEMAN, KEITH B., Asst. Prof. of Food Animal Medicine (1977). BS 195B, DVM 195B, Kan. St. Univ.

BLAUCH, BRUCE S., Assoc. Prof. of Small Animal Medicine (1965, 1977). BS 1949, Pa. St. Univ.; VMD 1956, Univ. of Pa.; MS 1969, Kan. St. Univ. (GF)

BRANDT, GARY W., Asst. Prof. of Equine Medicine (1969). BS 1964, DVM 1966, MS 1971, Univ. of Ill.

BURRDUGHS, ALBERT L., Assoc. Prof. of Virology (196D). Research Virologist. BS 1938, Univ. of Wyo.; DVM 195B, Tex. A & M Col.; MS 1941, Mont. St. Col.; PhD 1946, Univ. of Calif. (GF)

BUTLER, HUGH C., Prof. of Surgery (196B). Diplomate, American Col. of Veterinary Surgeons, 1965; 8S 195D, DVM 1954, MS 196B, Wash. St. Univ. (GF)

CARNAHAN, DAVID L., Assoc. Prof. of Dbstetrics and Gynecology (1961, 1972). Diplomate, American Col. of Veterinary Theriogenology. BS 1959, DVM 1959, MS 1964, Kan. St. Univ.

CHAPMAN, THDMAS E., Assoc. Prot. of Physiological Chemistry (1969, 1974). Research Nutritional Physiologist. BS 1962, DVM 1964, PhD 1969, Univ. of Calif. (GF)

CLARENBURG, RUDDLF, Prof. of Physiological Chemistry (1966, 1974). Research Physiological Chemist. BS 1954, PhD 1959, St. Univ. of Utrecht. (GF)

CDFFEE, E. GUY, Asst. Prof., Veterinary Medicine Library (1970). AB 195B, Univ. of Mo.; ML 197D, Kan. St. Teach. Col.

CDLES, EMBERT H., JR., Prof. and Head, Department of Infectious Diseases (1954, 1964). Research Clinical Pathologist. DVM 1945, Kan. St. Univ.; MS 1946, Iowa St. Col.; PhD 195B, Kan. St. Univ. (GF)

CDDK, JAMES E., Prof. of Pathology (1969, 1972, 1975). Dir. of Animal Resource Facility. Research Pathologist. Diplomate, American Col. of Veterinary Pathologists, 1956; DVM 1951, Dkla. St. Univ.; PhD 197D, Kan. St. Univ. (GF)

DENNIS, STANLEY M., Prof. and Head, Department of Pathology. Research Pathologist. (1966, 196B). Diplomate, American Col. of Theriogenologists. BVSc 1949, PhD 1961, Univ. of Sydney. FRCVS 1962, MRC Path. 1974. (GF)

FEDDE, M. ROGER, Prof. of Physiology (1964, 1973). Research Neurophysiologist. BS 1957, Kan. St. Univ.; MS 1959, PhD 1963, Univ. of Minn. (GF)

FDRTNEY, WILLIAM D., Asst. Prot. of Small Animal Medicine (1977). BS 197D, DVM 1974, Univ. of Mo.

FRANK, EDWARD R., Prof. of Surgery Emeritus (1926, 1935, 1962). BS 1918, DVM 1924, MS 1929, Kan. St. Univ.

FRANK, RDNALD E., Instr. (1973, 1976). BA 1972, Ft. Hays St. Univ.

FREY, RUSSELL A., Prot. and Head, Department of Anatomy and Physiology (1963, 1970, 1975). DVM 1952, PhD 197D, Kan. St. Univ. (GF)

FRICK, EDWIN J., Prof. Emeritus of Surgery and Medicine. (1919, 1935, 1966). DVM 1918, Cornell Univ. (GF)

GABBERT, NATHAN H., Asst. Prot. of Small Animal Medicine (1973). DVM 1963, Wash. St. Univ.

GATZ, RANDALL N., Asst. Prof. of Physiology (1976). Research Respiratory Physiologist. BS 1966, Univ. of Louisville; MS 1969, PhD 1973, Univ. of Ky. (GF)

GRAY, ANDREW P., Assoc. Prof., Diagnostic Lab. (1964, 1971). Research Pathologist. DVM 1953, MS 1963, PhD 1966, Kan. St. Univ. (GF)

GUFFY, MARK M., Prof. of Radiology (1963, 1976). Diplomate, American Col. of Veterinary Radiology, 1968. DVM 1949, MS 1966, Colo. St. Univ. (GF)

HARTKE, GLENN T., Asst. Prof. of Anatomy (1962, 1974). 8S 195B, DVM 1960, MS 1965, PnD 1974, Kan. St. Univ. (GF)

HDFFMAN, SHRYLL L., Instr. of Clinical Pathology (1977). BS 196B, Kan. Wesleyan.

HDWARD, DENNIS R., Instr., Diagnostic Lab. (1972, 1976). 8S 1972, MS 1976, Kan. St. Univ.

JERNIGAN, LDYCE D., Temp. Asst. Prof. of Medicine (1965). DVM 1945, Kan. St. Univ.

JDHNSDN, LINDA M., Asst. Instr. (1970). BS 1969, Dhio Univ.

JULIUS, MARCIA F., Instr., Asst. to the Dean (1972, 1976). 8S 1965, MS 1976, Kan. St. Univ.

KEETDN, KERRY S., Assoc Prot. of Clinical Pathology (1977). Research Clinical Pathologist. Diplomate, American Col. of Veterinary Pathologists. BS 1965, DVM 1966, Tex. A & M Univ.; PhD 1971, Univ. of Calif. (GF)

KELLEY, DDNALD C., Prof. of Public Health (1958, 1969). Research Mycologist. Diplomate, American Board of Veterinary Public Health. DVM 1935, MS 1952, Kan. St. Univ. (GF)

KIMBALL, ALICE DAY, Instr. in Pathology, Parasitology and Public Health Emeritus (1934, 1955). BS 1935, Kan. St. Univ.

KIORPES, ANTHONY L., Asst. Prof. of Physiology (1977). Research Respiratory Physiologist. BA 1970, Columbia Univ.; MS 1974, PhD 1977, Univ. of Wis.

KITSELMAN, CHARLES H., Prof. of Pathology Emeritus (1919, 1933, 1965). VMD 191B, Univ. of Pa.; MS 1927, Kan. St. Univ. (GF)

KLEMM, ROBERT D., Assoc. Prof. of Anatomy (1972). Research Functional Morphologist. BS 1957, Capital Univ.; MS 1959, Ohio Univ.; PhD 1964, Southern Ill. Univ. (GF)

KRUCKENBERG, SAMUEL M., Assoc. Prof. of Pathology (1975, 1976). Research Pathologist. Diplomate, American Col. of Laboratory Animal Medicine, 196B. DVM 1963, MS 1965, PhD 1971, Kan. St. Univ. (GF)

LEASURE, ELDEN E., Dean Emeritus; Prof. of Pathology, Parasitology and Public Health Emeritus (1926, 194B, 1964). DVM 1923, MS 1930, Kan. St. Univ. (GF)

LEIPOLD, HORST W., Prof. of Pathology (1970). Research Pathologist. DVM 1963, Justus Liebig Univ.; MS 1967, PhD 196B, Kan. St. Univ. (GF)

LELAND, STANLEY E., JR., Prof. of Parasitology (1967, 1975). Research Parasitologist, Assoc. Dir., Ag. Exp. Sta. (1975). BS 1949, MS 1950, Univ. of Ill.; PhD 1953, Mich. St. Univ. (GF)

LINDQUIST, WILLIAM O., Prof. of Parasitology (196B). Research Parasitologist BS 1940, MS 1942, Univ. of Idaho; ScD 1949, Johns Hopkins Univ. (GF)

MILLER-DAVIS, PAMELA A., Instr. (1977). BS 1971, MS 1974, Univ. of Mo.

MILLERET, ROY J., Assoc. Prof., Diagnostic Lab. (1960, 1974). Research Pathologist. DVM 1944, MS 1959, Kan. St. Univ.

MINOCHA, HARISH C., Prof. of Virology (1969, 1977). Research Virologist. BVSc 1955, Ind.; MS 1963, PhD 1967, Kan. St. Univ. (GF)

MOORE, WILLIAM E., Assoc. Prof. of Clinical Pathology (196B, 1973). Research Clinical Pathologist. Diplomate, American Col. of Veterinary Pathologists, 1972. BS 1956, DVM 195B, Cornell Univ.; PhD 196B, Univ. of Minn. (GF)

MORRIS, Paul G., Asst. Prof. of Equine Medicine (1977). DVM 1974, Ohio St. Univ.; MS 1977, Tex. A & M Univ.

MOSIER, JACOB E., Prof. and Head, Department of Surgery and Medicine (1945, 1961). Diplomate, American Col. of Veterinary Internal Medicine, 1972. DVM 1945, MS 1948, Kan. St. Univ. (GF)

NOOROSY, JOHN L., Prof. of Surgery, Asst. Dean (1960, 1966, 1976). Research Clinical Scientist. BS 1943, S.D. St. Col.; DVM 1946, MS 1962, Kan. St. Univ. (GF)

OEHME, FREDERICK W., Prof. of Toxicology, Medicine and Physiology (1959, 1973). Research Toxicologist. Diplomate, American Board of Veterinary Toxicology, 196B. BS 1957, DVM 195B, Cornell Univ.; MS 1962, Kan. St. Univ.; Dr. Med. Vet. 1964, Justus Liebig Univ.; PhD 1969, Univ. of Mo. (GF)

PHILLIPS, ROBERT M., Assoc. Prof., Diagnostic Lab. (1975). Research Virologist. DVM 1951, Kan. St. Univ.; PhD 1972, Univ. of Ga. (GF)

QUADRI, S. KALEEM, Assoc. Prof. of Physiology (1977). Research Endocrinologist & Reproductive Physiologist. MS 1966, Kan. St. Univ.; MS 1970, PhD 1973, Mich. St. Univ. (GF)

RAILSBACK, LEE T., Prof. of Surgery and Medicine (1961, 1976). BS 1936, DVM 1937, Kan. St. Univ.

ROBERTS, CAROLYN V., Instr., Asst. to the Dean (1977). BS 1955, Univ. of Colo.; MS 1976, Kan. St. Univ.

SAMUELSON, MARVIN L., Asst. Prof. of Small Animal Medicine (1973, 1975). DVM 1956, Kan. St. Univ.

SCHNEIDER, JACOB E., Assoc. Prof. of Equine Medicine (1972). BS 1958, DVM 1960, Colo. St. Univ.

SCHONEWEIS, DAVID A., Assoc. Prof. of Food Animal Medicine (1966, 1977). BS 1956, DVM 1956, MS 1971, Kan. St. Univ. (GF)

SEEFELDT, SONDRA L., Asst. Prof. of Pathology (1977). BS 1969, DVM 1971, PhD 1977, Kan. St. Univ.

SMITH, JOSEPH E., Assoc. Prof. of Pathology (1969). Research Pathologist. Diplomate, American Col. of Veterinary Pathologists, 1972. BS 1959, DVM 1961, Tex. A & M Univ.; PhD 1964, Univ. of Calif. (GF)

STRAFUSS, ALBERT C., Assoc. Prof. of Pathology (196B). Research Pathologist. BS 1952, DVM 1954, Kan. St. Univ.; MS 195B, Iowa St. Univ., PhD 1963, Univ. of Minn. (GF)

TAUSSIG, ROBERT A., Assoc. Prof. of Small Animal Medicine (1966, 1977). DVM 1945, Colo. St. Univ.; MS 1970, Kan. St. Univ

TROTTER, DONALD M., Dean; Prof. of Anatomy (1956, 1971). Research Anatomist. Assoc. Dir., Agr. Exp. Sta. Diplomate, American Col. of Veterinary Pathologists, 1951; DVM 1946, MS 1957, Kan. St. Univ. (GF)

UNDERBJERG, GRAVERS K.L., Prof. Emeritus of Physiology (194B, 1972). BS 1926, Royal Veterinary and Agricultural Col., Copenhagen; DVM 1943, PhD 1939, Iowa St. Univ. (GF)

UPSON, DAN W., Prof. of Pharmacology (1959, 1974). Fellow, American Col. of Veterinary Pharmacology and Therapeutics, 1977. DVM 1952, MS 1962, PhD 1969, Kan. St. Univ. (GF)

VESTWEBER, JEROME G.E., Assoc. Prof. of Food Animal Medicine (1977). DVM 1964, Univ. of Minn.; MS 1970, PhD 1973, Kan. St. Univ.

WEINMAN, DONALD E., Assoc. Prof. of Anatomy (1974). Research Anatomist. DVM 1946, Kan. St. Univ.; MSc 1960, PhD 1967, Univ. of Ga. (GF)

WEST, JOHN L., Prof., Diagnostic Lab. (1974). Research Pathologist. DVM 1936, Kan. St. Univ.; MS 194B, PhD 1952, Univ. of Wis. (GF)

WESTFALL, JANE A., Prof. of Microanatomy (1957, 1976). Research Neuroscientist. AB 1950, Col. of Pacific; MA 1952, Mills Col.; PhD 1965, Univ. of Calif. (GF)

WILLARD, LLOYD H., Instr., Animal Resource (1972). BS 1970, Kan. St. Univ.

Division of Continuing Education

AYRES, BETTY A., Instr., Asst. Dir. (1974). BA 1961, MA 1972, Univ. of Iowa.

BILES, BERTRAM R., Instr. (temporary) (1972). BA 1963, PhD 1976, Kan St. Univ.

BLAIR, WILLIAM O., Instr. (1977). BA 1960, Ariz. St. Univ.; MS 1964, PhD 1977, Univ. of N.M.

BROCK, STEPHEN C., Assoc. Prof. (1975). BA 1964, Lake Forest Col.; MA 1966, PhD 196B, Cornell Univ.

CAMERON, RICHARD B., Asst. Instr. (temporary) (1975). BS 1974, Kan. St. Univ.

CASHIN, WILLIAM E., Assoc. Prof. (1975). AB 195B, MA 1961, PhD 1969, Catholic Univ. of America.

COLLINS, KITCHELL T., Instr. (1977). BS 1967, MEd 1973, Sam Houston St. Univ.

CREES, ROBIN A., Instr. (1977). BA 1972, MA 1975, Univ. of Iowa.

DIECKHOFF, KENNETH L., Instr. (1969). BA 1965, Ft. Hays St. Univ.; MA 1969, Univ. of Kan.

DRAVES, WILLIAM A., Instr. (temporary) (1976). BA 1971, Univ. of Wis.; MA 1976, Geo. Wash. Univ.

DUNN, MADELINE L., Asst. Instr. (1972). BS 1941, Kan. St. Teachers Col.

DUNN, WELLINGTON J., Instr. (1975). BS 1959, Kan. St. Univ.

FLAHERTY, ROBERTA D., Instr. (1970, 1975). BEd 1970, Washburn Univ. of Topeka; MS 1975, Kan. St. Univ.

GEORGACARAKOS, GEORGE N., Asst. Prof. (temporary) (1975). BA 1967, Univ. of Me, MA 1968, PhD 1973, Univ. of Mo.

HAROLD, E. NORMAN, Dir., Asst. Prof. (1963, 1969, 1972, 1975). BA 1960, Emporia St. Univ.; MA 1963, Vanderbilt Univ.; PhD 1975, Kan. St. Univ.

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HOUCK, MARCIA L., Instr., Franklin County, Ottawa (1976) BS 1976, Emporia St. Univ
HOWERTON, LELA JEAN, Instr., Rice County, Lyons (1969, 1972). BS 1969, Ft. Hays St. Univ
HOWERTON, PHYLLIS Y., Instr., Reno County, Hutchinson (1966). BA 1963, Southwestern Col.
HUNO, MARGARET A., Instr., Jackson County, Holton (1960). BS 1960, Kan. St. Univ
JACKSON, CAROLYN W., Instr., Harvey County, Newton (1975). BS 1975, Kan. St Univ
JACKSON, PRISCILLA K., Instr., Ellis County, Hays (1970). BS 1966, Ft. Hays St. Univ.
JOHNSON, JUANITA B., Instr , Crawford County, Girard (194B). BS 1945, Kan St Univ
JOHNSON, ANN R., Instr., Morris County, Council Grove (1977). BS 1977, Kan. St. Univ.
JOHNSON, SUSAN J., Instr., Republic County, Belleville (1977). BS 1977, Kan. St. Univ
JONES, SUSAN C., Instr., Jewell County, Mankato (1976). BS 1976, Kan. St. Univ.
KENT, NANCY JO, Instr., Ford County, Dodge City (1959, 1964). BS 1959, Ft. Hays St Univ.
KINDLER, BEVERLY L., Instr., Norton County, Norton (1952, 1960). BS 1952, Kan St. Univ , MA 1967, Mich St. Univ.
KOHMAN, CAROL A., Instr., Scott County, Scott City (1974, 1976). BS 1970, Marymount Col.; MS 1974, Kan. St. Univ
KROEMER, ELVINA R., Instr., Atchison County, Effingham (1974). BS 1970, Kan St. Univ
KURTENBACH, TERESA J., Instr., Phillips County, Phillipsburg (1974). BS 1974, Kan St Univ

LARSON, PATRICIA A., Instr., Haskell County, Sublette (1976). BS 1974, Univ of Neb.
LAUBHAN, SUE P., Instr., Saline County, Salina (1967, 1971). BS 1967, MS 1973, Kan. St. Univ.
LEACH, GLINDA B., Instr., Shawnee County, Topeka (1967). BS 1950, Southeast Mo. St. Col.; MS 1961, MEd 1966, Univ. of Mo.
LILYHORN, BARBARA G., Instr., Bourbon County, Ft. Scott (1977). BS 1976, Kan. St. Univ.
LOFLIN, JOANN A., Instr., Russell County, Russell (1976). BS 1976, Kan. St. Univ.
LUPFER, KATHRYN L., Instr., Lincoln County, Lincoln (1977). BA 1976, Sterling Col
MAGGARD, MARGARET H., Instr., Cutler County, El Dorado (1963, 1970). BS 1963, Kan. St. Univ
MANVILLE, ARLETA L., Instr., Jefferson County, Oskaloosa (1969). BS 1969, Ft. Hays St. Univ
MARK, EMILY R., Instr., Leavenworth County, Leavenworth (1964, 1969). BS 1965, Sterling Col.
McDANIEL, KAREN A., Instr., Wilson County, Fredonia (1975, 1977). BS 1975, Southwestern Col.
McGUIRE, MARIANNE, Instr., Sedgwick County, Wichita (1976). BS 1975, Ft. Hays St. Univ.
MERRIMAN, SCHARON V., Instr., Reno County, Hutchinson (1971, 1972). BS 1970, Kan. St Univ.
MILLER, STACEY J., Instr., Pawnee County, Larned (1976). BS 1976, Kan. St. Univ.
MOLZ, DIXIE I., Instr., Stafford County, St. John (1953). BS 1944, Northwestern Okla. Col.
MOLZEN, SHARON B., Instr., Harvey County, Newton (1969). BS 1969, Kan. St. Univ.
MOSS, CONNIE S., Instr., Chase County, Cottonwood Falls (1972, 1977). BS 1972, Kan. St. Univ
NEASE, LINDA J., Instr., Sumner County, Wellington (1976). BS 1972, Kan. St. Univ.; MEd 1975, Penn. St. Univ
NELSON, GAYLENE S., Instr., Wichita County, Leoti (1975). BS 1975, Bethany Nazarene Col.
NEWELL, ALATHEA R., Instr., Woodson County, Yates Center (1976). BS 1976, Sterling Col.
PAYNE, DEBORAH J., Instr., Gray County, Cimarron (1977). BS 1976, Kan. St. Univ.
PEARSON, GLENDA N., Instr., Washington County, Washington (1965, 1967). BS 1965, Kan. St Univ
QUIRING, SUSAN M., Instr., Johnson County, Olathe (1972, 1977). BS 1973, Ottawa Univ.; MS 1977, Kan. St. Univ.
REDIKER, JANET B., Instr., Lyon County, Emporia (1966, 1977). BS 195B, Emporia St Univ
REIST, DEANNA K., Instr., Clay County, Clay Center (1974, 1977). BS 1974, Kan. St. Univ.
RICE, TRUDY M., Instr., Douglas County, Lawrence (1974). BS 1973, Kan. St. Univ
RICHARDS, JEAN L., Instr., Thomas County, Colby (1974). BS 1974, Kan. St Univ.
RICHMOND, MARY F., Instr., Osage County, Lyndon (1975). BS 1973, Pittsburg St. Univ.
ROBINSON, ELSIE C., Instr., Decatur County, Oberlin (1969). BS 1942, Ft. Hays St. Univ
SCHRANDT, MARY M., Instr., Mitchell County, Beloit (1976). BS 1976, Iowa St. Univ
SCHROEDER, DOROTHEA A., Instr., Wyandotte County, Kansas City (1950). AB 1940, Bethel Col
SCHUSTER, NANCY D., Instr., Anderson County, Garnett (1972). BS 1972, Ft. Hays St. Univ
SCHWERTFEGER, JOLENE J., Instr., McPherson County, McPherson (1971). BS 1969, Ft Hays St. Univ.
SEBES, DOROTHY D., Instr., Hodgeman County, Jetmore (1967). BS 1967, Bethel Col.
SHIELDS, SANDRA A., Instr., Ottawa County, Minneapolis (1965, 1977). BS 1965, Kan. St. Univ
SINIARD, JOYCE P., Instr., Stanton County, Johnson (1971). BS 1971, Southwest Mo St
SPLATTSTOESSER, NADINE L., Instr., Wallace County, Sharon Springs (1977). BS 1977, Kan. Wesleyan.
STEFFENS, PATRICIA E., Instr., Crawford County, Girard (1971). BS 195B, Univ. of Okla., MEd 1962, Pittsburg St. Univ.
SULLIVAN, CARLA M., Instr., Chautauqua County, Sedan (1973). BS 1973, Kan. St. Univ.
SWENSON, SHELLEY C., Instr., Cloud County, Concordia (1975). BS 1974, South Dakota St. Univ
SWISHER, MARY T., Instr., Rush County, LaCrosse (1970). BS 1970, Kan. St. Univ
THODEN, NADA F., Instr., Miami County, Paola (1965). BS 1965, Colo. St. Univ.
THOMPSON, LOUISE P., Instr., Kiowa County, Greensburg (1968). BS 1945, Kan. St. Univ
THORSELL, CATHERINE, Instr., Clark County, Ashland (196B). BS 196B, Kan St. Univ.
TOOT, JANICE C., Instr., Seward County, Liberal (1966, 1972). BS 1966, Kan. St. Univ.
TRAUX, RUBY C., Instr., Sedgwick County, Wichita (1959). BS 1936, Kan. St. Univ
VICE, FAYE E., Instr., Labette County, Altamont (1946). BS 1941, Okla. Col. for Women
VIOLA, L. ANN, Instr., Shawnee County, Topeka (1974). BS 1969, Kan. St. Univ.
WATTS, TRANDA W., Instr., Gove County, Gove (1972). BS 1972, Ft. Hays St. Univ.
WEAVER, MAE K., Instr., Barton County, Great Bend (1952). BS 1949, Kan. St. Univ.
WEAVER, MARSHA K., Instr., Dickinson County, Abilene (1976). BS 1972, Kan. St. Univ.
WELCH, DORIS M., Instr., Kearny County, Lakin (1976). BS 1967, Jacksonville St. Univ.
WELP, JUDY J., Instr., Sherman County, Goodland (1977). BS 1977, Colo. St. Univ.
WILLIAMS, ELIZABETH A., Instr., Cheyenne County, St. Francis (1975). BS 1974, Texas Tech.
WOLFE, FRANCES M., Instr., Wyandotte County, Kansas City (1970). BS 1941, Marymount Col.
YOUNG, CAROL H., Instr., Edwards County, Kinsley (1976). BS 1966, Emporia St. Univ.; MEd 1971, Wichita St. Univ.

County Extension 4-H Agents

ABERCROMBIE, LILA M., Instr., Saline County, Salina (1975). BS 1975, Kan. St. Univ.
ANDEREGG, MARVIN K., Instr., Labette County, Altamont (1969). BS 1969, Kan. St. Univ.
ARNOLD, J.E., Instr., Franklin County, Ottawa (1977). BS 1977, Kan. St. Univ.
BAILEY, MARTHA E., Instr., Crawford County, Girard (1976). BS 1974, Kan. St. Univ.
CASEY, LINDA M., Instr., Seward County, Liberal (1974, 1976). BS 1973, No. Oak. St. Univ.
CHRISTIAN, MICHAEL L., Instr., Dickinson County, Abilene (1975). BS 1973, Okla. St. Univ.
CLAWSON, ELDON L., Instr., Shawnee County, Topeka (1965, 1967). BS 1965, Kan. St. Univ.
DAVIS, ROBERT J., Instr., Reno County, Hutchinson (1967, 1971). BS 1964, Kan. St. Univ
DeWERFF, DONALD M., Instr., Rice County, Lyons (1977). BS 1976, Kan. St. Univ.
FORD, DENNIS T., Instr., Butler County, El Dorado (1976). BS 1975, Okla. St. Univ.
FORD, ROY D., Instr., Sumner County, Wellington (1964, 1977). BS 1964, MS 1975, Okla. St. Univ
FULTZ, WILLIAM E., Instr., Sedgwick County, Wichita (1962, 1970). BS 1961, Kan. St. Univ.; MEd 1964, Wichita St. Univ
GOOD, AMY T., Instr., Geary County, Junction City (1977). BS 1976, Kan. St. Univ.
GUETTERMAN, STEPHEN F., Instr., Ellis County, Hays (1976). BS 1975, Kan. St. Univ.
HART, MARY A., Instr., McPherson County, McPherson (1977). BS 1977, Kan. St. Univ.
KEHLER, DAVID F., Instr., Cherokee County, Columbus (1976). BS 1975, Kan. St. Univ.
KLEIN, KATHLEEN A., Instr., Ford County, Dodge City (1977). BS 1976, Kan. St. Univ.
LANHAM, K. EUGENE, Instr., Wyandotte County, Kansas City (1971). BS 1970, Kan. St. Univ.
LARSON, CHARYL D., Instr., Finney County, Garden City (1976). BS 1976, Kan. St. Univ.
LAUFERT, CELESTE K., Instr., Grant County, Ulysses (1977). BS 1976, Colo. St. Univ.
LEWIS, JANENE, Instr., Cowley County, Winfield (1977). BS 1977, Kan St. Univ
LOVEDAY, RITA T., Instr., Riley County, Manhattan (1974). BS 1972, Univ. of Tenn.
MALONE, ALTON B., Instr., Lyon County, Emporia (1973). BA 196B, BA 1971, Emporia St. Univ
McCURRY, MARY S., Instr., Riley County, Manhattan (1977). BS 1975, Univ. of Tenn.; MS 1977, Kan. St. Univ.
RECTOR, RALPH B., Instr., Leavenworth County, Leavenworth (1949, 1956). BS 1952, MS 1969, Kan. St. Univ
RICHARDSON, LINDY L., Instr., Douglas County, Lawrence (1973, 1977). BS 1973, Kan. St. Univ
SALLEE, LESLIE H., Instr., Kingman County, Kingman (1960, 1977). BS 1952, MS 1960, Kan. St. Univ.
SHARP, JAMES M., Instr., Sedgwick County, Wichita (1973). BS 1971, Kan. St. Univ.
SMITH, JENELL M., Instr., Sedgwick County, Wichita (1974). BS 1971, Kan. St. Univ.
STOVER, BARBARA J., Instr., Miami County, Paola (1976). BS 1976, Kan. St. Univ.
STUDER, RAYMOND L., Instr., McPherson County, McPherson (1966). BS 1961, Kan. St. Univ.
SULZBACH, JACQUE L., Instr., Russell County, Russell (1976). BS 1976, Friends Univ
SWISHER, BRIAN A., Instr., Montgomery County, Independence (1976). BS 1975, Kan. St Univ.
VAN SKIKE, WILLIAM V., Instr., Barton County, Great Bend (1950, 1959). BS 1950, Kan. St. Univ.; MEd 1965, Colo. St. Univ.
VEROODRN, SUSAN M., Instr., Franklin County, Ottawa (1974). BS 1974, Iowa St. Univ.
WALLACE, SHELLIE S., Instr., Pottawatomie County, Westmoreland (1977). BS 1976, Kan. St. Univ.
WILSON, MARGARET E., Instr., Ford County, Dodge City (1972). BS 1972, Kan. St. Univ.
WINEINGER, PATRICK S., Instr., Harvey County, Newton (1974, 1976). BS 1973, Kan. St. Univ.

County Extension Horticultural Agents

GEORGE, STEVEN W., Instr., Harvey County, Newton (1977). BS 1970, Okla. St. Univ.
KAPS, MARTIN L., Instr., Butler County, El Dorado (1977). BS 1964, Ohio Univ.; MS 1976, Ohio St. Univ.
MORRIS, MAX B., Instr., Shawnee County, Topeka (1965). BS 1959, Kan. St. Univ
STOUSE, LAWRENCE D., Instr., Johnson County, Olathe (1966). BS 1963, Kan. St. Univ.
THDLE, H. THOMAS, Instr., Barton County, Great Bend (1965, 1966). BS 1965, Okla. St. Univ.
WARMINSKI, NORMAN C., Instr., Sedgwick County, Wichita (196B, 1970). BS 1964, Okla. St. Univ.; MS 196B, Texas A&M
WELFELT, DAVID S., Instr., Harvey County, Newton (1975, 1976). BS 1974, Kan. St. Univ.

Student Conduct and Records Policy

Philosophy Of Student Conduct

The members of the University community at K-State expect students to make mature responses to problem situations and to conduct themselves in exemplary fashion as they interact with all members of the learning community. However, if a student is unable to act as a responsible citizen in the University setting and violates the KSU Honor Conduct Code, the other members of the University community feel that they have an obligation to assist him, help review the action, confront the student and those who have been offended, and make every effort to readjust the student's goals and responsibilities to the extent self-obligations and obligations to others can be fulfilled effectively and fully and continue the student's program toward a degree.

The confrontation necessary to bring about this analysis and potential change is provided by staff members of the Center for Student Development, faculty advisers, and student judicial system.

As the individual is involved in actions which do not meet the requirements of the members of the educated community, he or she is confronted and has the opportunity for change. There may be times when peers and those responsible for the climate of learning of the University feel that the best opportunity for change lies outside the University community. The student may be asked to remove himself or herself from the University setting for a particular amount of time. Such action is not taken lightly and must be taken in the context of concern for the growth and development of the student. It is expected that each student in the University community abide by the University Honor Conduct Code and assist each other student in the University community to do likewise.

KSU Honor And Conduct Code

Individual responsibility and self-government are the major principles in maintaining honorable relations among K-State students, between the students and the faculty, and between the students and other members of the local community. All students are expected to show both within and outside the University respect for personal honor and the rights of others. A student's conduct and behavior will conform to standards of a good citizen when:

1. Kansas State University rules and regulations are adhered to.
2. Local community laws and customs are abided by.
3. He or she is honest in all scholastic work.
4. No irresponsible, destructive, or riotous acts are committed.
5. No acts reflecting adversely on Kansas State University, or acts which are detrimental to the public are committed.
6. The rights of fellow students are respected.

Academic Honesty

The encouragement of high standards of academic honesty and integrity on the part of students is a function of every member of the faculty. Violations of the K-State Honor Code, instances of plagiarism, and cheating in an examination receive discipline from the instructor involved. While the instructor may exercise considerable discretion in assessing penalties for dishonest practices, if in doubt as to the proper course of action the student should report the case through the department head to the office of the dean of the college. The office of the Vice President for Student Affairs frequently has access to correlative information which makes possible a more positive and consistent treatment of individual behavioral problems.

Disciplinary actions resulting in dismissal from the University are noted on the student's permanent record; other disciplinary actions become a part of the student's personnel record.

Questions concerning the K-State Honor Code and procedures concerning policies in student affairs and government should be directed to the Office of Student Affairs.

Student Records

University Policy Regarding Student Records

Kansas State University maintains various records concerning students, to document their academic progress as well as to record their interactions with University staff and officials. In order that the student's rights to privacy be preserved, as well as to conform with federal law, the University has established certain policies to govern the handling of students' records. Interpretation of these policies is based on continued experience with educational records, and the policies themselves may subsequently be modified in light of this experience.

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 name, Manhattan address and telephone number, permanent mailing address, college, curriculum, year in school, date and place of birth, dates of attendance at Kansas State, 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 by the Office of Admissions and Records for undergraduates and by the Graduate 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 should be made at the Office of Admissions and Records, which will notify other appropriate University offices.

Confidential Information

With the exception of the information noted above, students' records are generally considered to be confidential. The following policies govern access to 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 Director of Records; for graduate students, the Graduate Office
b. Admissions records: For undergraduates, the Director of Admissions; for graduate students, the Graduate Office
c. Financial aid records: Director of Student Financial Assistance Office
d. Business records: University Comptroller
e. Traffic and security records: Head of Security and Traffic Control
f. Medical records: Director, Student Health Service
g. Counseling records: Director, Counseling Center
h. Actions of academic standards committees: College Dean
i. Academic disciplinary records: Chair, Undergraduate Grievance Committee
j. Non-academic disciplinary records: Dean of Students
k. Residence hall records: Director of Residential Area
l. Housing business records: Director of Housing
m. Placement records: Director of Career Planning and Placement
n. Evaluations for admission to graduate or professional programs: Dean or department head
o. Special academic programs: Faculty member in charge of the program, and Dean of the College
p. Foreign student records: Foreign student adviser
q. Test scores for College Level Examination Program (CLEP), American College Testing Program (ACT), Miller Analogies Test (MAT), etc.: Director, Center for Student Development

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.

3. The responsible official may release records to University personnel who have a legitimate need for the information.

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

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—six copies free; one dollar per copy thereafter.
b. Housing department records—four cents per page.
c. Medical charts—free for medical, employment or marriage license purposes; otherwise $7.50 to $15.00.
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: 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 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.

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 Director of Student Records. The grades of other students will be sent to their parents only with written permission of the student.

When Records May Be Withheld

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 records 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 Director of Records.

Review And Challenge Of Records

Upon request, a record covered by the act will be made available within a reasonable time to the student 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 he 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. It will be conducted by a hearing officer appointed by the president. The hearing will be held within two weeks. A decision will be rendered within two weeks after the hearing. The student will have the opportunity at the hearing to present any relevant evidence.

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, Department of HEW, 330 Independence Avenue, S.W., Washington, D.C. 20201.



Enrollment Summary

Fall, 1977

United States

Alabama	13
Alaska	4
Arizona	30
Arkansas	21
California	77
Colorado	75
Connecticut	42
Delaware	1
District of Columbia	8
Florida	37
Georgia	16
Hawaii	17
Idaho	3
Illinois	164
Indiana	23
Iowa	56
Kansas	16,341
Kentucky	10
Louisiana	21
Maine	6
Maryland	22
Massachusetts	57
Michigan	25
Minnesota	31
Mississippi	26
Missouri	511
Montana	3
Nebraska	130
Nevada	3
New Hampshire	3
New Jersey	93
New Mexico	23
New York	119
North Carolina	17
North Dakota	16
Ohio	45
Oklahoma	35
Oregon	13
Pennsylvania	58
Rhode Island	7
South Carolina	4
South Dakota	35
Tennessee	8
Texas	48
Utah	12
Vermont	7
Virginia	25
Washington	7
West Virginia	2
Wisconsin	41
Wyoming	24
U.S. TOTAL	18,415
Puerto Rico	40
International students	590
UNIVERSITY TOTAL	19,045

International Students

Afghanistan	1
Australia	1
Bangladesh	6
Bolivia	5
Brazil	5
Cameroon	1
Canada	1
Chile	1
China	92
Colombia	5
Egypt (U.A.R.)	1
Ethiopia	8
France	1
Germany	7
Ghana	1
Greece	1
Guyana	2
Hong Kong	10
India	55
Indonesia	5
Iran	89
Iraq	17
Israel	2
Ivory Coast	2
Japan	10
Jordan	4
Kenya	1
Korea	16
Lebanon	4
Lesotho	1
Liberia	3
Libya	3
Malaysia	5
Mauritius	1
Mexico	9
New Zealand	2
Niger	1
Nigeria	98
Pakistan	9
Peru	1
Philippines	19
Poland	1
Rhodesia	1
Samoa	1
Saudi Arabia	14
Sri Lanka	5
Sudan	3
Switzerland	1
Syria	2
Tanzania	10
Thailand	16
Turkey	1
United Kingdom (England)	1
Venezuela	16
Vietnam	9
Yemen	2
Yugoslavia	1

Number of Countries	57
Number of Students	590
Number of Women	115
Number of Men	475
Number of Undergraduates	215
Number of Graduates	375

The above survey by country does not include permanent resident foreign students.

Degrees Conferred

Academic Year 1976-77

	Men	Women	Total
Agriculture			
Agriculture	332	87	419
Bakery Science & Mgmt.	9	2	11
Feed Science & Mgmt.	10	0	10
Milling Science & Mgmt.	18	0	18
Food Science & Industry	7	3	10
College Sub Total	376	92	468
Architecture & Design			
Architecture	107	4	111
Interior Architecture	12	3	15
Landscape Architecture	17	2	19
Building Construction	0	0	0
College Sub Total	136	9	145
Arts & Sciences			
Bachelor of Arts	36	76	112
Bachelor of Fine Arts	10	17	27
Bachelor of Music	0	2	2
Bachelor of Science	424	336	760
B.S. in Music Ed.	13	16	29
B.S. in Physical Ed.	5	5	10
Associate of Arts	7	2	9
College Sub Total	499	456	955
Business Administration			
Business Admin.	256	94	350
Associate of Arts	3	0	3
College Sub Total	259	94	353
Education			
Bachelor of Science (Educ.)	32	61	93
B.S. in Elem. Ed.	17	163	180
College Sub Total	49	224	273
Engineering			
Agricultural Engg.	22	1	23
Chemical Engg.	11	0	11
Civil Engg.	34	3	37
Electrical Engg.	48	2	50
Industrial Engg.	10	1	11
Mechanical Engg.	31	2	33
Nuclear Engg.	17	2	19
Engg. Technology	21	0	21
Architectural Engg.	8	0	8
Construction Science	37	1	38
College Sub Total	241	12	253
Home Economics			
Home Economics	8	316	324
Home Econ. & Mass. Comm.	1	3	4
Restaurant Mgmt.	3	0	3
Food Science & Ind.	0	0	0
College Sub Total	12	319	331
Total Baccalaureate Degrees	1572	1206	2778
Veterinary Medicine			
Doctor of Veterinary Medicine	81	10	91
Graduate School			
Master of Arch.	4	0	4
Master of Arts	38	30	68
Master of Landscape Architecture	5	0	5
Master of Regional & Comm. Planning	9	0	9
Master of Science	347	406	753
Master of Bus. Adm.	19	7	26
Master of Music	5	2	7
Master of Accounting	0	0	0
Doctor of Philosophy	109	29	138
Sub Total	617	484	1101
Total Degrees Conferred	2189	1690	3879

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