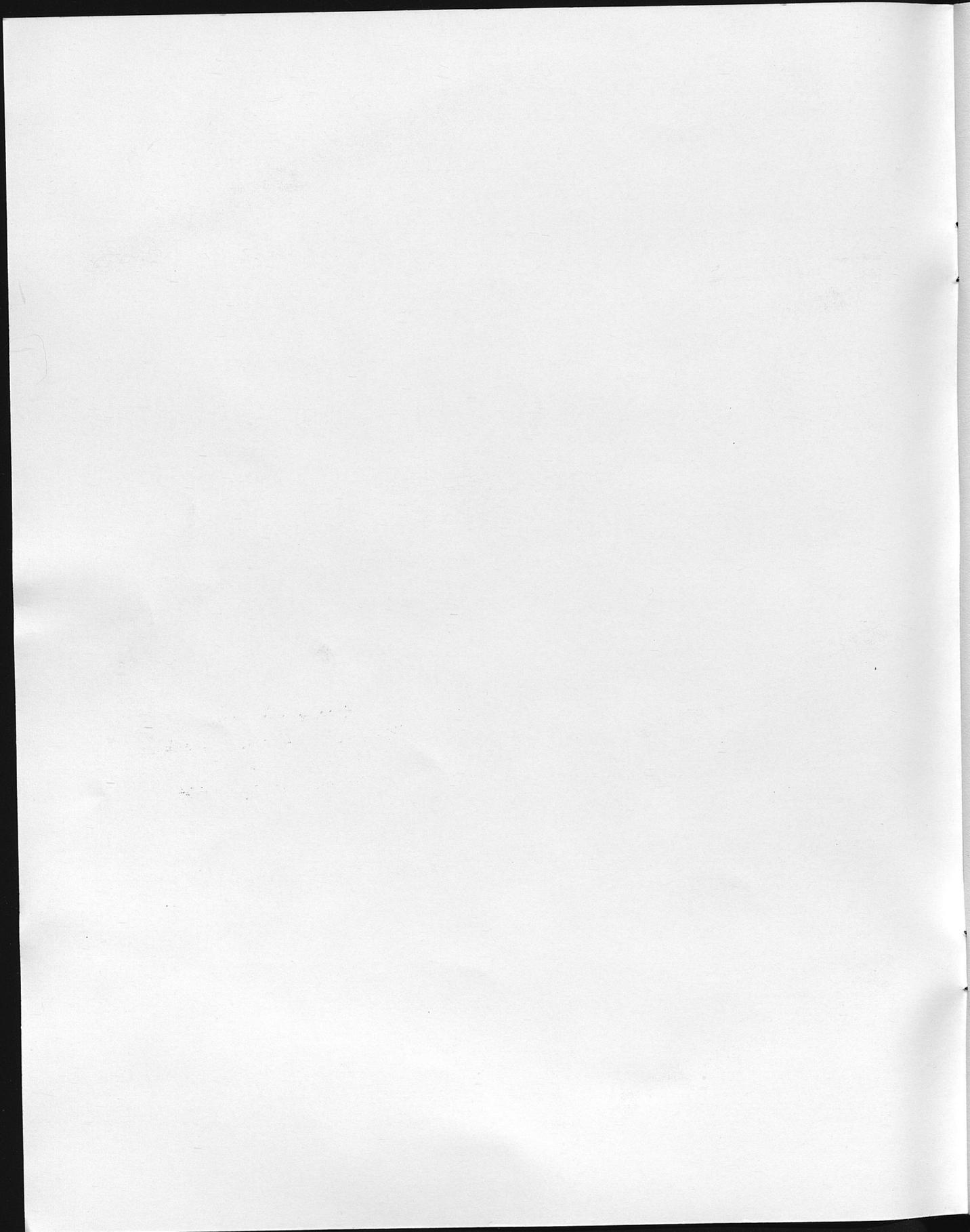


An architectural line drawing of a multi-story building facade with a grid of windows. In the foreground, there is a large, multi-tiered fountain with water cascading down. The drawing is signed 'H. L. 78' in the bottom right corner.

*University
of Kentucky
Bulletin*

The Graduate School
1988-90



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The Graduate School

University of Kentucky Bulletin

FALL II

NUMBER 6

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1992

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Printed August 1992

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Calendar

Students should check the *Schedule of Classes* each semester for any calendar changes which may have been approved after publication of this Bulletin.

The approved Calendar for the academic year 1989-1990 will be published in the *Schedule of Classes* each semester.

1988 FALL SEMESTER

APPLICATION FOR ADMISSION

- February 15**—Monday—Recommended date for freshmen to submit 1988 Fall Semester application
- March 15**—Tuesday—Deadline for submission of all application materials, College of Medicine, for Fall, 1988
- June 1**—Wednesday—Undergraduates planning to participate in the Summer Advising Conferences, in preparation for the 1988 Fall Semester, should apply for admission or readmission.
- June 15**—Wednesday—Earliest date to submit application for regular and Early Decision Program admission, College of Medicine, for Fall, 1989
- July 22**—Friday—Deadline for applying for admission or readmission to The Graduate School for the 1988 Fall Semester
- August 1**—Monday—Deadline for application for Early Decision Program, College of Medicine, for Fall, 1989
- August 10**—Wednesday—Deadline for undergraduate and graduate students applying for admission or readmission for the 1988 Fall Semester in order to register August 22 and avoid late fee
- October 15**—Saturday—Undergraduates planning to participate in the November Advising Conference for the 1989 Spring Semester should apply for admission or readmission
- November 15**—Tuesday—Deadline for application, College of Medicine, for Fall, 1989
- December 1**—Thursday—Deadline for submission of application and receipt of all materials for admission, readmission or transfer to the College of Law for the 1989 Spring Semester
- December 9**—Friday—Deadline for applying for admission or readmission to The Graduate School for the 1989 Spring Semester
- December 14**—Wednesday—Deadline for undergraduate and graduate students applying for admission or readmission for the 1989 Spring Semester in order to register January 9 and avoid late fee

REGISTRATION

- June 20-July 22**—Summer Advising Conferences for new freshmen, Community College transfers, advanced standing (transfer) students, auditors, nondegree and readmitted students enrolling for the 1988 Fall Semester
- August 22**—Monday—Registration for new students who have been cleared for admission but did not advance register
- August 24-30**—Wednesday through Tuesday—Late registration for returning students who did not ad-

vance register and new applicants cleared late for admission. A late fee is assessed students who register late.

- September 14**—Wednesday—Last day to change grading option (pass/fail to letter grade or letter grade to pass/fail; credit to audit or audit to credit) in college dean's office
- September 14**—Wednesday—Last day to file for repeat option in college dean's office if student is retaking a course in the 1988 Fall Semester
- November 7**—Monday—1989 Spring Semester Advising Conference for new and readmitted undergraduate students
- November 9-16**—Wednesday through Wednesday—Advance registration for the 1989 Spring Semester (These dates are subject to change.)

ADD/DROP

- August 23**—Tuesday—Centralized add/drop for Advance Registered students
- August 23**—Tuesday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees
- August 30**—Tuesday—Last day to enter an organized class for the 1988 Fall Semester
- August 30**—Tuesday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- September 14**—Wednesday—Last day to drop a course without it appearing on the student's transcript
- October 17**—Monday—Last day to drop a course
- October 17**—Monday—Last day to withdraw from the University or reduce course load and receive any refund

WITHDRAWAL

- August 23**—Tuesday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees
- August 30**—Tuesday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- October 17**—Monday—Last day to withdraw from the University or reduce course load and receive any refund

FEE PAYMENT

- August 3**—Wednesday—Last day Advance Registered students may pay \$50 to confirm their 1988 Fall Semester registration
- August 23**—Tuesday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees
- August 30**—Tuesday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund

- September 7**—Wednesday—Last day for payment of registration fees and/or housing and dining fees in order to avoid cancellation of registration and/or meal card
- September 16**—Friday—Last day for reinstatement of students cancelled for nonpayment of registration fees and/or housing and dining fees. Requires payment of fees and may require payment of \$50 reinstatement fee.
- October 17**—Monday—Last day to withdraw from the University or reduce course load and receive any refund
- December 16**—Friday—Last day to request a refund for the 1988 Fall Semester
- December 21**—Wednesday—Last day Advance Registered students may pay \$50 to confirm their 1989 Spring Semester registration

DEGREES AND GRADUATION

- September 22**—Thursday—Last day for filing an application for a December degree in college dean's office
- November 3**—Thursday—Last day for doctoral candidates for a December degree to submit a Notification of Intent to schedule a final examination in The Graduate School
- November 17**—Thursday—Last day for candidates for a December degree to schedule a final examination in The Graduate School
- December 1**—Thursday—Last day for candidates for a December graduate degree to sit for a final examination
- December 16**—Friday—Last day for candidates for a December degree to submit a thesis/dissertation to The Graduate School

OTHER IMPORTANT DATES—BEGINNING AND END OF SEMESTER AND ACADEMIC HOLIDAYS

- August 20-22**—Saturday through Monday—Fall Orientation for all new undergraduate students.
- August 24**—Wednesday—Class work begins.
- September 5**—Monday—Labor Day—Academic Holiday
- November 8**—Tuesday—Presidential Election—Academic Holiday
- November 24-26**—Thursday through Saturday—Thanksgiving Holiday—Academic Holiday
- December 9**—Friday—End of class work
- December 12-16**—Monday through Friday—Final Examinations
- December 16**—Friday—End of 1988 Fall Semester
- December 19**—Monday—Final deadline for submission of grades to the Registrar's office by 4 p.m.

1989 SPRING SEMESTER

APPLICATION FOR ADMISSION

- December 14, 1988**—Wednesday—Deadline for undergraduate and graduate students applying for admission or readmission for the 1989 Spring Semester in order to register January 9 and avoid \$40 late fee
- February 1**—Wednesday—Deadline for submitting application for admission to the College of Dentistry for Fall 1989
- February 15**—Wednesday—Recommended date for freshmen to submit 1989 Fall Semester application
- February 15**—Wednesday—Last day for submission of application for admission to the College of Law for 1989 Fall Semester
- March 15**—Wednesday—Undergraduates planning to participate in the April Advising Conference for the 1989 Summer Sessions should apply for admission or readmission.
- March 15**—Wednesday—Deadline for submission of all application materials, College of Medicine, for Fall 1989
- March 31**—Friday—Last day for receipt of all supporting credentials for admission to College of Law for 1989 Fall Semester
- April 7**—Friday—Deadline for applying for admission or readmission to The Graduate School for the 1989 Summer Sessions
- April 26**—Wednesday—Deadline for undergraduate and graduate students applying for admission or readmission for the 1989 Four-Week Intercession in order to register May 8 and avoid \$40 late fee
- May 24**—Wednesday—Deadline for undergraduate and graduate students applying for admission or readmission for the 1989 Eight-Week Summer Session in order to register June 7 and avoid \$40 late fee
- June 1**—Thursday—Undergraduates planning to participate in Summer Advising Conferences, in preparation for the 1989 Fall Semester, should apply for admission or readmission.
- July 21**—Friday—Deadline for applying for admission or readmission to The Graduate School for the 1989 Fall Semester

REGISTRATION

- January 9**—Monday—Registration for new students who have been cleared for admission but did not advance register
- January 11-18**—Wednesday through Wednesday—Late registration for returning students who did not advance register and new applicants cleared late for admission. A \$40 late fee is assessed students who register late.

- February 1**—Wednesday—Last day to change grading option (pass/fail to letter grade or letter grade to pass/fail; credit to audit or audit to credit) in college dean's office
- February 1**—Wednesday—Last day to file for repeat option in college dean's office, if student is retaking a course in the 1989 Spring Semester
- April 3**—Monday—1989 Summer Session Advising Conference for new freshmen, new advanced standing (transfer) students, auditors, readmitted and nondegree students, Community College transfer students and Community College applicants cleared for the 1989 Fall Semester
- April 5-12**—Wednesday through Wednesday—Advance registration for 1989 Fall Semester and both 1989 Summer Sessions

ADD/DROP

- January 10**—Tuesday—Centralized add/drop for Advance Registered students
- January 10**—Tuesday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees
- January 18**—Wednesday—Last day to enter an organized class for the 1989 Spring Semester
- January 18**—Wednesday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- February 1**—Wednesday—Last day to drop a course without it appearing on the student's transcript
- March 3**—Friday—Last day to withdraw from a course
- March 3**—Friday—Last day to withdraw from the University or reduce course load and receive any refund

WITHDRAWAL

- January 10**—Tuesday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees
- January 18**—Wednesday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- March 3**—Friday—Last day to withdraw from the University or reduce course load and receive any refund

FEE PAYMENT

- January 10**—Tuesday—Last day a student may officially drop a course or cancel registration with the

- University Registrar for a full refund of fees
- January 18**—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- January 25**—Wednesday—Last day for payment of registration fees and/or housing and dining fees in order to avoid cancellation of registration and/or meal card
- February 3**—Friday—Last day for reinstatement of students cancelled for nonpayment of registration fees and/or housing and dining fees. Requires payment of fees and may require payment of \$50 reinstatement fee.
- March 3**—Friday—Last day to withdraw from the University or reduce course load and receive any refund
- May 5**—Friday—Last day to request a refund for the 1989 Spring Semester

DEGREES AND GRADUATION

- February 9**—Thursday—Last day for filing an application for a May degree in college dean's office
- March 23**—Thursday—Last day for doctoral candidates for a May degree to submit a Notification of Intent to schedule a final examination in The Graduate School
- April 6**—Thursday—Last day for candidates for a May degree to schedule a final examination in The Graduate School
- April 20**—Thursday—Last day for candidates for a May graduate degree to sit for a final examination
- April 28**—Friday—Last day for doctoral candidates for a May degree who wish to receive a diploma at Commencement to submit dissertation to The Graduate School
- May 5**—Friday—Last day for candidates for a May degree to submit a thesis/dissertation to The Graduate School
- May 7**—Sunday—Commencement Day
- January 11**—Wednesday—Class work begins
- January 16**—Monday—Martin Luther King Birthday—Academic Holiday
- March 13-18**—Monday through Saturday—Spring Vacation—Academic Holidays
- April 28**—Friday—End of class work
- May 1-5**—Monday through Friday—Final Examinations
- May 5**—Friday—End of 1989 Spring Semester
- May 8**—Monday—Final deadline for submission of grades to the Registrar's Office by 4 p.m.
- May 8-August 19**—College of Pharmacy 15-Week Summer Term

1989 FOUR-WEEK INTERSESSION

APPLICATION FOR ADMISSION

- March 15**—Wednesday—Undergraduates planning to participate in the April Advising Conference for the 1989 Summer Sessions should apply for admission or readmission.
- April 7**—Friday—Deadline for applying for admission or readmission to The Graduate School for the 1989 Summer Sessions
- April 26**—Wednesday—Deadline for undergraduate and graduate students applying for admission or readmission for the 1989 Four-Week Intercession in order to register May 8 and avoid \$40 late fee
- May 24**—Wednesday—Deadline for undergraduate and graduate students applying for admission or readmission for the 1989 Eight-Week Summer Session in order to register June 7 and avoid \$40 late fee
- June 1**—Thursday—Undergraduates planning to participate in Summer Advising Conferences, in preparation for the 1989 Fall Semester, should apply for admission or readmission.

- participate in Summer Advising Conferences, in preparation for the 1989 Fall Semester, should apply for admission or readmission.
- July 21**—Friday—Deadline for applying for admission or readmission to The Graduate School for the 1989 Fall Semester

REGISTRATION

- April 3**—Monday—1989 Summer Session Advising Conference for new freshmen, new advanced standing (transfer) students, auditors, readmitted and nondegree students, Community College transfer students and Community College applicants cleared for 1989 Fall Semester
- May 8**—Monday—Registration for new students who have been cleared for admission but did not advance register

- May 9-12**—Tuesday through Friday—Late registration for returning students who did not advance register and new applicants cleared late for admission. A \$40 late fee is assessed students who register late.
- May 15**—Monday—Last day to change grading option (pass/fail to letter grade or letter grade to pass/fail; credit to audit or audit to credit) in college dean's office
- May 15**—Monday—Last day to file for repeat option in college dean's office, if student is retaking a course in the 1989 Four-Week Intercession

ADD/DROP

- May 9**—Tuesday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees.
- May 12**—Friday—Last day to enter an organized class for the Four-Week Intercession

- May 12**—Friday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- May 15**—Monday—Last day to drop a course without it appearing on the student's transcript
- May 22**—Monday—Last day to withdraw from a course
- May 22**—Monday—Last day to withdraw from the University or reduce course load and receive any refund

WITHDRAWAL

- May 9**—Tuesday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees
- May 12**—Friday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- May 22**—Monday—Last day to withdraw from the University or reduce course load and receive any refund

1989 EIGHT-WEEK SUMMER SESSION

APPLICATION FOR ADMISSION

- March 15**—Wednesday—Undergraduates planning to participate in the April Advising Conference for the 1989 Summer Sessions should apply for admission or readmission.
- May 24**—Wednesday—Deadline for undergraduate and graduate students applying for admission or readmission for the 1989 Eight-Week Summer Session in order to register June 7 and avoid \$40 late fee
- June 1**—Thursday—Undergraduates planning to participate in the Summer Advising Conferences, in preparation for the 1989 Fall Semester, should apply for admission or readmission.
- July 21**—Friday—Deadline for applying for admission or readmission to The Graduate School for the 1989 Fall Semester
- August 9**—Wednesday—Deadline for undergraduate and graduate students applying for admission and readmission for the 1989 Fall Semester in order to register August 21 and avoid \$40 late fee

REGISTRATION

- April 3**—Monday—1989 Summer Session Advising Conference for new freshmen, new advanced standing (transfer) students, auditors, readmitted and nondegree students, Community College transfer students and Community College applicants cleared for 1989 Fall Semester
- June 7**—Wednesday—Registration for new students who have been cleared for admission but did not advance register
- June 8-12**—Thursday through Monday—Late registration for returning students who did not advance register and new applicants cleared late for admission. A \$40 late fee is assessed students who register late.
- June 19**—Monday—Last day to change grading option (pass/fail to letter grade or letter grade to pass/fail; credit to audit or audit to credit) in college dean's office
- June 19**—Monday—Last day to file for repeat option in college dean's office if student is retaking a course in the 1989 Eight-Week Summer Session
- June 19-July 21**—Summer Advising Conferences for

FEE PAYMENT

- May 9**—Tuesday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees
- May 12**—Friday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- May 22**—Monday—Last day to withdraw from the University or reduce course load and receive any refund
- May 22**—Monday—Last day to pay registration fees and/or housing and dining fees in order to avoid cancellation of registration and/or meal card
- June 1**—Thursday—Last day for reinstatement of students cancelled for nonpayment of registration fees and/or housing and dining fees. Requires payment of fees and may require payment of \$50 reinstatement fee.
- June 6**—Tuesday—Last day to request a refund for 1989 Four-Week Intersession

ADD/DROP

- June 8**—Thursday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees.
- June 12**—Monday—Last day to enter an organized class for the 1989 Eight-Week Summer Session
- June 12**—Monday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- June 19**—Monday—Last day to drop a course without it appearing on the student's transcript
- July 6**—Thursday—Last day to withdraw from a course
- July 5**—Thursday—Last day to withdraw from the University or reduce course load and receive any refund

WITHDRAWAL

- June 8**—Thursday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees.
- June 12**—Monday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- July 6**—Thursday—Last day to withdraw from the University or reduce course load and receive any refund

FEE PAYMENT

- June 8**—Thursday—Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees.
- June 12**—Monday—Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund
- June 21**—Wednesday—Last day to pay registration fees and/or housing and dining fees in order to avoid cancellation of registration and/or meal card
- June 30**—Friday—Last day for reinstatement of students cancelled for nonpayment of registration fees

DEGREES AND GRADUATION

- June 28**—Wednesday—Last day for doctoral candidates for an August degree to submit a Notification of Intent to schedule a final examination in The Graduate School

OTHER IMPORTANT DATES—BEGINNING AND END OF SEMESTER AND ACADEMIC HOLIDAYS

- May 8**—Monday—Beginning of College of Pharmacy 15-Week Summer Term
- May 9**—Tuesday—Class work begins.
- May 29**—Monday—Memorial Day—Academic Holiday
- June 6**—Tuesday—Final Examinations
- June 6**—Tuesday—End of the 1989 Four-Week Intersession
- June 9**—Friday—Final deadline for submission of grades to the Registrar's Office by 12 noon

- and/or housing and dining fees. Requires payment of fees and may require payment of \$50 reinstatement fee.

- July 6**—Thursday—Last day to withdraw from the University or reduce course load and receive any refund
- August 2**—Wednesday—Last day Advance Registered students may pay \$50 to confirm their 1989 Fall Semester registration
- August 3**—Thursday—Last day to request a refund for the 1989 Eight-Week Summer Session

DEGREES AND GRADUATION

- June 23**—Friday—Last day for filing an application for an August degree in college dean's office
- June 28**—Wednesday—Last day for doctoral candidates for an August degree to submit a Notification of Intent to schedule a final examination in The Graduate School
- July 12**—Wednesday—Last day for candidates for an August degree to schedule a final examination in The Graduate School
- July 26**—Wednesday—Last day for candidates for an August graduate degree to sit for a final examination
- August 3**—Thursday—Last day for candidates for an August degree to submit a thesis/dissertation to The Graduate School

OTHER IMPORTANT DATES—BEGINNING AND END OF SEMESTER AND ACADEMIC HOLIDAYS

- June 8**—Thursday—Class work begins.
- July 4**—Tuesday—Independence Day—Academic Holiday
- August 3**—Thursday—End of the 1989 Eight-Week Summer Session
- August 3**—Thursday—Final examinations
- August 7**—Monday—Final deadline for submission of grades to the Registrar's Office by 12 noon
- August 19**—Saturday—End of College of Pharmacy 15-Week Summer Term



David P. Roselle, Ph.D.
President of the University

Wimberly C. Royster, Ph.D.
Vice President for Research and Graduate Studies

Daniel R. Reedy, Ph.D.
Acting Dean of The Graduate School

The Graduate School

The University of Kentucky began offering graduate work in 1870 and awarded its first graduate degrees in 1876. The Graduate School became a distinct unit in the University organization in 1912.

The Graduate School is concerned with advanced study, graduate instruction and research conducted by the faculty and students of all colleges and departments. The total graduate resources of the University are merged under it for the purpose of promoting the acquisition of knowledge in an atmosphere of free and lively inquiry.

Graduate work is offered in most colleges in the University. A general description and tabulation of courses for each of the various programs is given in the Graduate School Programs section of this bulletin.

The Academic Common Market

Kentucky is a participating state in The Academic Common Market, an interstate agreement among Southern states for sharing academic programs. Students who qualify for admission may enroll in a specific program in another

A.C.M. state on an in-state tuition basis. At present, the agreement has been limited to unusual graduate programs. For information write: Southern Regional Education Board, 130 Sixth Street N.W., Atlanta, Georgia 30313.

UK-NKU Graduate Center

The University of Kentucky and Northern Kentucky University established a Graduate Center at Northern Kentucky University beginning the fall semester of 1977, for the purpose of meeting graduate education needs for the Northern Kentucky region in some fields which have not been met previously.

The Graduate Center utilizes faculty from the University of Kentucky and some faculty from Northern Kentucky University where there is expertise in one of the fields being offered in the Center.

Students interested in taking graduate courses at the Northern Kentucky Graduate Center should either contact the Center office at Northern Kentucky University or The Graduate School at the University of Kentucky for information about the curricula being offered through the Center.

Degrees Conferred

Doctor of Philosophy

Agricultural Economics	Civil Engineering	Entomology	Microbiology	Political Science
Agricultural Engineering	Communication	Geography	Music	Psychology
Anatomy	Computer Science	Geology	Nursing	Public Administration
Animal Sciences	Crop Science	Higher Education and Social and Philosophical Studies	Pharmaceutical Sciences	Sociology
Anthropology	Economics	History	Pharmacology	Soil Science
Biochemistry	Educational and Counseling Psychology	Mathematics	Philosophy	Spanish
Biology	Electrical Engineering	Mechanical Engineering	Physics and Astronomy	Statistics
Biomedical Engineering	Engineering Mechanics	Metallurgical Engineering and Materials Science	Physiology and Biophysics	Toxicology
Chemical Engineering	English		Plant Pathology	Veterinary Science
Chemical Physics			Plant Physiology	
Chemistry				

Master of Arts

Anthropology	Diplomacy	Geography	Mathematics	Psychology
Art	Economics	German	Music	Sociology
Classical Languages	English	History	Philosophy	Spanish
Communication	French	Library Science	Political Science	Theatre Arts

Master of Science

Anatomy	Computer Science	Mathematics	Physiology and Biophysics	Psychology
Agricultural Economics	Crop Science	Microbiology	Health, Physical Education, Recreation	Soil Science
Animal Sciences	Economics	Pharmacology	Plant Pathology	Statistics
Biochemistry	Entomology	Pharmaceutical Sciences	Plant Physiology	Toxicology
Biology	Geology	Physics		Veterinary Science
Chemistry				

Master of Science in Agriculture

Agricultural Economics	Crop Science	Forestry	Plant Pathology	Soil Science
Animal Sciences	Entomology	Horticulture	Sociology	

Other Degrees

Doctor of Business Administration	Doctor of Education	Master of Arts in Interior Design	Master of Arts in Textiles and Clothing	Master in Civil Engineering
	Doctor of Musical Arts	Master of Arts in Teaching (Mathematics)	Master of Business Administration	Master of Fine Arts

Master of Music	cultural Engineering	Master of Science in Education	Master of Science in Library Science	Operations Research
Master of Nutritional Sciences	Master of Science in Biomedical Engineering	Master of Science in Electrical Engineering	Master of Science in Mechanical Engineering	Master of Science in Public Health
Master of Public Administration	Master of Science in Chemical Engineering	Master of Science in Engineering Mechanics	Master of Science in Metallurgical Engineering and Materials Science	Master of Science in Radiological Medical Physics
Master of Rehabilitation Counseling	Master of Science in Civil Engineering	Master of Science in Family Studies	Master of Science in Mining Engineering	Master of Social Work Specialist in Education
Master of Science in Accounting	Master of Science in Clinical Nutrition	Master of Science in Forestry	Master of Science in Nursing	
Master of Science in Agricul-	Master of Science in Dentistry	Master of Science in Health Physics	Master of Science in	

Organization of The Graduate School

The Graduate Faculty consists of the Dean of The Graduate School, Associate and/or Assistant Deans of The Graduate School, and Full and Associate Graduate Faculty Members. As the chief University agency for the promotion of the ideals of graduate study, it determines the policies of The Graduate School and makes recommendations to the University Senate and to the President, or to other administrative officials as appropriate. All rules affecting graduate work and the inauguration of new graduate programs must be approved by the Graduate Faculty.

Any proposed change in the rules of the Graduate Faculty must be included in the agenda of its meeting and circulated to the Graduate Faculty at least 10 days prior to the meeting at which it is to be considered.

New Graduate Faculty members may be proposed to the Dean of The Graduate School at any time by the college deans and department chairs concerned, or in the case of persons not attached to a college faculty, by the appropriate chancellors of the University. Eligibility qualifications are as follows:

1. The doctor's degree or its equivalent in scholarly reputation.
2. The rank of assistant professor (or equivalent), or higher.
3. Scholarly maturity and professional productivity as demonstrated by publications, editorial services, research surveys, creative work or patents; and research in progress at the time of appointment.
4. Demonstrated participation in the graduate teaching and research program.

Appointment to the Graduate Faculty is made by the President of the University on nomination by the Dean of The Graduate School after the Dean and the Graduate Council have studied the credentials submitted in support of the proposed members.

Full members of the Graduate Faculty are particularly responsible for:

1. Guidance of graduate student research and study to its completion. The finished work should meet or exceed accepted standards for publication, dissemination or performance within the particular discipline and
2. Participation in the formulation of graduate curricula and policy.

The Graduate Dean has the responsibility to appoint and monitor the progress of Associate Members of the Graduate Faculty. Associate members are authorized to teach graduate

courses, direct master's theses, serve on and co-chair doctoral committees. Appointment to Associate Membership requires one year of faculty experience at the University of Kentucky or a comparable university. Associate membership may continue for five years. At the end of the five-year term as an Associate Member the members are promoted to full membership or terminated.

On recommendation of the Director of Graduate Studies and with the approval of the Graduate Dean, persons who normally do not hold academic appointment in the University, but who have demonstrated an interest in collaborative participation in its graduate programs, may be appointed as Auxiliary Graduate Faculty Members. They should hold the terminal academic degree in the field and possess a record of research or creative experience which would warrant their inclusion on advisory committees to assist graduate students in conducting research. Rights and privileges of Auxiliary Graduate Faculty Members are equivalent to those of Associate Graduate Faculty members.

The statutory requirement of promotion or termination at the end of the five-year probationary term should be followed. A terminated Associate Member may at any later time be considered and promoted to Full Membership, but not be reappointed to Associate Membership. Associate Membership for additional terms may be permitted by the Dean of the Graduate School in appropriate master's level programs.

Membership in the Graduate Faculty is restricted to persons who satisfy the membership criteria and are able to assume the responsibilities in a particular program as set forth above. There is no category for at-large graduate faculty membership.

Administrative officers assigning teaching and other duties to members of the Graduate Faculty who are taking an active part in the graduate program (i.e., are heavily engaged in directing theses, carrying on productive research, etc.) should make appropriate reduction in the duties required of such faculty members.

The Role of the Dean

The Dean of The Graduate School is charged with the administration of the policies adopted by the Graduate Faculty and the University Senate relating to graduate studies. The Dean presides over all meetings of the Graduate Faculty and calls meetings of this faculty whenever it is advisable or whenever requested to do so by one-fourth of the membership. Recommendations are made by the Dean to the Graduate Faculty regarding the requirements for advanced degrees, the regulations necessary to insure a high stan-

dard of graduate work and all other aspects of the graduate program. The graduate programs are administered in the interest of efficient instruction and the highest attainment possible on the part of each graduate student. The Dean is responsible for determining and certifying to the Registrar candidates who have fulfilled requirements for advanced degrees.

The President and the Dean of The Graduate School shall be *ex officio* members of all committees of The Graduate School. The Chancellor for the Lexington Campus and the Chancellor for the Medical Center are *ex officio* members of all committees of The Graduate School which affect their respective sectors.

The Graduate Council

The Graduate Council is composed of 18 members and the Dean of The Graduate School, who serves as chair. There are 16 faculty representatives and two student representatives. Associate deans serve in a non-voting, *ex officio* capacity.

The composition of the Graduate Council is as follows: two members from the College of Agriculture, three members from the College of Arts and Sciences, one member from the College of Business and Economics, two members from the College of Education, one member from the College of Engineering, one member from the Colleges of Communications and Fine Arts, two members from the Colleges of Medicine and Pharmacy, one member from the Colleges of Allied Health Professions, Dentistry and Nursing, one member from the Colleges of Library Science, Home Economics, and Social Work, and two members appointed by the Dean of The Graduate School.

Members representing a college or a combination of colleges are elected by the Graduate Faculty in the respective colleges.

Two graduate student members are selected by the Council from a panel of four submitted by the Graduate and Professional Student Association. The term of office of the elected members is three years and that of the graduate students is one year. Members may not succeed themselves until three years have elapsed since the completion of their last term.

The Graduate Council approves or disapproves proposals concerning courses offered for graduate credit, and advises and lends assistance to the Dean in executing the policies and regulations determined by the Graduate Faculty. Specifically, the Council:

1. Evaluates department requests relating to proposed graduate programs.
2. Reviews existing programs and curricula.
3. In cooperation with the Dean, initiates recommendations to the Graduate Faculty. (This procedure is not intended to prevent a faculty member from bringing any recommendation or request directly before the Graduate Faculty.)

The Graduate Council has such authority as is herein granted, or such as the Dean or the Graduate Faculty may delegate to it. A majority of the Graduate Council constitutes a quorum for the transaction of business.

Directors of Graduate Studies

The Dean of The Graduate School, with the advice of the

college dean(s) and the approval of the President, may recommend to the Graduate Faculty the areas of graduate study and research into which the University may be divided. (The logical unit for an area is a department. By common consent, however, certain departments may be grouped into a single area to offer a graduate program; and in exceptional cases a department may be divided into two or more areas to offer programs in the respective areas.) Directors of Graduate Studies are the local representatives of each graduate program; they provide for the program's administration; and they act as the official liaison with The Graduate School.

Directors of Graduate Studies are responsible to the Graduate Faculty of their program and to the Dean of The Graduate School for the recruitment, admission, advising, and examining of students in their program. Consequently, they have an important effect on the quality of graduate programs at the University of Kentucky. In addition to Directors of Graduate Studies for specific programs, some colleges have designated individual faculty members as Associate Dean for Graduate Studies who serve as the local extension of The Graduate School at the college level.

Directors of Graduate Studies are appointed by the Dean of The Graduate School after consultation with the respective Graduate Faculty and administration in a program. The DGS is normally a tenured faculty member, holding the rank of Associate Professor or above, and is a full member of the Graduate Faculty.

The Director of Graduate Studies of a graduate program reports directly to the Dean of The Graduate School or to the Dean's designee on all matters relating to graduate education in the program. The DGS is responsible to the Dean of The Graduate School for the administration of the specific graduate program, including maintenance of records, administration of graduate program funds, admission of graduate students, the University Scholars' Program, fellowships, program requirement changes and new programs, advising and registration, appointment of advisory and examination committees, and other degree requirements related to the graduate program. Additionally, the DGS serves as the focal point for dissemination of information from The Graduate School and for the gathering of information.

Directors of Graduate Studies serve as program advisers to each student until the student has a thesis or dissertation director. The DGS then recommends that the thesis or dissertation director be appointed the student's adviser or committee chair. In areas where theses are not required, the DGS is the adviser of all students not writing theses. *All student schedules should be endorsed by the student's adviser.* If it is desirable, a DGS may recommend that additional advisers in the program be appointed. A DGS who is to be absent from the University for as long as a semester must inform the Dean so that a substitute may be appointed.

A more detailed description of the role and responsibilities of the Director of Graduate Studies is available in The Graduate School office.

Establishment and Modification of Graduate Programs

An area which wishes to establish a new graduate program or modify an existing one must submit its program to the Graduate Council, which will make a recommendation concerning it to the Graduate Faculty.

Student Responsibility

It is the student's responsibility to be informed concerning all regulations and procedures required by the course of study being pursued. *In no case will a regulation be waived or an exception granted because a student pleads ignorance of the regulation or asserts that information was not presented by advisers or other authorities.* Therefore, the student should become familiar with The Graduate School Bulletin, including (1) the section presenting the requirements for degrees and (2) the departmental offerings and requirements.

The Director of Graduate Studies in the student's major program should be consulted concerning course requirements, any deficiencies, the planning of a program, and special regulations. Programs may have degree requirements that are not listed in the Bulletin.

It is to be noted that the Graduate Dean interprets the Graduate Bulletin. Only the Graduate Council may waive requirements stated in this Bulletin.

Confidentiality of Student Records

In accordance with the Family Education Rights and Privacy Act of 1974, University of Kentucky students have the right to review, inspect, and challenge the accuracy of information kept in a cumulative file by the institution unless the student waives this right in writing. Records cannot be released in other than emergency situations without the written consent of the student, except in the following situations:

- A. to other school officials, including faculty within the educational institution or local educational agency who have legitimate educational interests;
- B. to officials of other schools or school systems in which the student intends to enroll, upon condition that the student be notified of the transfer, receive a copy of the record if desired, and have an opportunity for a hearing to challenge the content of the record;
- C. to authorized representatives of 1) the Comptroller General of the United States, 2) the Secretary, 3) an administrative head of an education agency or 4) state educational authorities;
- D. in connection with a student's application for, and receipt of, financial aid;
- E. where the information is classified as "directory information." The following categories of information have been designated by the University as directory information: name, address, telephone listing, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational institution attended by the student. If you do not wish such information released without your consent you should notify the Registrar's Office prior to the first day of classes.

Questions concerning this law and the University's policy concerning release of academic information may be directed to the Registrar's Office, 257-4623.

Residency Requirements

According to law, the University of Kentucky and all other state-supported institutions of higher education assess tui-

tion fees on the basis of Kentucky or non-Kentucky residence. The policy for determining residence is established by the Commonwealth of Kentucky Council on Higher Education. Students who are unsure of their residence status should check with the Registrar's Office before applying for admission.

Admission

The University of Kentucky is committed to a policy of providing educational opportunities to all qualified students regardless of economic or social status, and will not discriminate on the basis of race, color, sex, marital status, beliefs, age, national origin or handicap.

Applicants for admission to The University of Kentucky Graduate School for the Fall, 1989 and subsequent semesters must pay a \$20.00 application fee. A check or money order made payable to THE UNIVERSITY OF KENTUCKY should accompany the completed application. NO CASH OR STAMPS, PLEASE.

Students seeking admission to the University of Kentucky Graduate School must hold a baccalaureate degree from a fully accredited institution of higher learning. An overall undergraduate grade-point average of 2.5 and 3.0 on all graduate work is required by The Graduate School. Individual departments may require higher grade-point averages.

All applicants for admission to degree programs in The Graduate School must submit official scores on the verbal and quantitative portions of the Graduate Record Examination. (See Provisional Admission.) The College of Business and Economics may substitute the Graduate Management Admission Test for M.B.A., D.B.A. and Accounting applicants. Also, applicants for Public Administration may substitute the GMAT. The Medical College Admission Test or the Dental College Admission Test may be substituted in appropriate areas with the approval of the Dean of The Graduate School.

New students applying for admission must have two official transcripts sent by each institution of higher learning previously attended. All transcripts must be sent to The Graduate School office.

To be official, records must bear the Registrar's signature and/or official seal of the issuing institution. A summary of credits transferred and recorded on the transcript issued by the institution granting the degree will not suffice.

Application forms can be obtained by writing:

The Graduate School
Room 351, Patterson Office Tower
University of Kentucky
Lexington, Kentucky 40506-0027

Applications must be submitted no later than one month before the beginning of the term the applicant intends to begin graduate work. (See Calendar).

Graduate students may not be able to begin immediately a full graduate program leading to the degree they desire; it may be necessary for them to satisfy prerequisites which they omitted in their undergraduate curriculum. Deficiencies are determined by the program in which the major work is to be done. Ordinarily, graduate students may begin a full program in any field in which they have a balanced undergraduate major or its equivalent.

Admission to The Graduate School entitles students to take such courses as they desire, provided they have the necessary prerequisites and departmental approval.

Attendance in The Graduate School at the University of Kentucky is not a right. It is a privilege which may be withdrawn by the University or any area of graduate study if it is deemed necessary by the Dean of The Graduate School in order to safeguard the University's standards.

International Applicants

All non-U.S. citizens, except permanent residents of the U.S., should request an Application Form for International Students. Applicants must have excellent grades and rank in the top quarter of their classes. To be considered for entry as a graduate student an applicant must have had four years of university level work. **Indian students:** (a first-class record is normally expected although **high second-class holders in non-science areas may be considered** if they can offer further evidence of having been in at least the top 10 percent of their graduating class).

When credentials are submitted in support of any application, they should be either the original documents or certified copies (i.e., copies certified or attested as "true copies" by a notary public). An official translation must be attached to these records if they are in a language other than English. Credentials should include a record of all degrees earned, detailing all subjects taken and grades obtained. **Grades must be listed in the indigenous system.**

Applications will not be considered without official scores on the verbal and quantitative portions of the Graduate Record Examination (GRE). Business and Accounting applicants **must** substitute the Graduate Management Admissions Test (GMAT). Also, applicants for Public Administration may substitute the GMAT. If the Graduate Record Examination or the Graduate Management Admissions Test have not been taken write to the Educational Testing Service, Box 955, Princeton, NJ 08540, or Box 1502, Los Angeles, CA 95701, for information concerning the appropriate examination. The tests are administered five times throughout the year and test scores generally require six weeks for delivery. It is important, therefore, that the applicant take the appropriate test well in advance of the application deadline in order to allow ample time for scores to be received in The Graduate School office.

Test scores presented (GRE, GMAT and TOEFL) must be sent directly to the University of Kentucky Graduate School from ETS. Photocopies are not acceptable.

International applicants for admission to The University of Kentucky Graduate School for the fall, 1989 and subsequent semesters must pay a \$25.00 application fee. A check or money order in United States funds made payable to THE UNIVERSITY OF KENTUCKY should accompany the completed application. Applications will be processed upon receipt of the fee. **NO CASH OR STAMPS, PLEASE.**

English Proficiency Requirement: The University of Kentucky requires a score of 550 on the Test of English as a Foreign Language (TOEFL) of all applicants whose native language is not English. The test is given four times each year. The TOEFL Bulletin includes a registration form. Bulletins are available in many locations outside the U.S., usually at American embassies and consulates, offices of the United States Intercultural Communications Agency (ICA),

United States educational commissions and foundations, binational centers, and many private organizations such as the Institute of International Education (IIE), African American Institute (AAI), America-Mideast Educational and Training Services, Inc. (AMIDEAST), and American Korean Foundation.

Students who cannot obtain a TOEFL Bulletin and registration form locally should write, well in advance, to: Test of English as a Foreign Language, Box 899, Princeton, New Jersey 08540.

Financial Resources Requirement. Graduate applicants must certify that they have at least \$9,200 available for each 12-month period of study. It is estimated that this amount will cover the cost of tuition fees, books and supplies, room and meals, health insurance (explained below) and incidentals, for a single person.

The students must have on hand at the beginning of each registration period funds sufficient to pay for tuition, fees, room and board and health insurance. These costs are to be paid at the beginning of each term.

Note: Fees subject to change without notice.

Health Services

The University has an excellent health care program that is of special importance to foreign students. (See section on Health Service.)

Please note: UK international students must have hospitalization insurance that is payable in the United States. They are also responsible for any amount which insurance does not pay on these types of charges. Because of the extremely high cost of medical care, it is imperative that a student have insurance for him or herself, spouse, and children.

Health History Form

All international students must obtain, from the Student Health Service, a tuberculin screening test and reading and complete a health history form before registration will be allowed. This may be done any time between the hours of 8:00 a.m. and 3:30 p.m. as soon as possible following arrival on the University campus. The Health Service will provide written documentation that this requirement has been fulfilled.

(See also section on Health Service in this bulletin under Graduate Students.)

Application Deadline for International Students. Applications for admission should reach the Admissions Office at least six months before the opening of the term the applicant intends to begin graduate work; that is, February 1 for the fall semester which begins in late August, June 15 for the spring semester which begins in mid-January, and October 31 for all summer sessions.

No application will be considered until all supporting documents have been presented.

Program in English for Foreign Students. The English Department offers a Center for English as a Second Language which operates during the eight-week summer term, and during the fall and spring semesters. Students receive 160 hours of intensive English instruction in an eight-week period. No college credit is given for the Institute's course of study but students are given certificates of completion for the Center's program. Graduate students who enroll in the Center are usually University of Kentucky

students, and sometimes students are admitted to The Graduate School contingent upon successful completion of the Center. The Center is authorized under federal law to enroll non-immigrant alien students.

The fee is \$900,* and covers only instruction; it does not cover room and board. For further information write the Center for English as a Second Language, Department of English, UK, 40506.

*Subject to change without notice.

International Graduate Student Sponsors. International graduate students or scholars sponsored by external agencies which wish the University to provide special advising and management services will be charged a fee of \$400 per semester per student. In cases of a contractual agreement between the University and the sponsor which otherwise provides for such services, the fee will not be charged.

Readmission

Former University of Kentucky students in good standing are eligible for tentative readmission. Regular readmission is contingent on the approval of the student's program. They must file an application for readmission by the stated deadlines (See Calendar). An exception to this rule is made on behalf of students who attend only University Summer Sessions. These students do not have to apply for readmission to a Summer Session if they were enrolled for the preceding Summer Session. (No application fee is assessed for students seeking readmission.)

Residency Requirements

According to law, the University of Kentucky and all other state-supported institutions of higher education assess tuition fees on the basis of Kentucky or non-Kentucky residence. The policy for determining residence is established by the Commonwealth of Kentucky Council on Higher Education.

Students who are unsure of their residence status should check with the Registrar's Office before applying for admission.

Post-Baccalaureate Graduate Students

Students who hold a baccalaureate degree and who wish to pursue graduate study without a degree objective and students who do not fulfill the entrance requirements of The Graduate School may apply for admission as post-baccalaureate graduate students.

Admission to this status may be granted to an applicant who (1) demonstrates promise but has not qualified for admission to a degree program, or (2) intends not to complete a degree program. Students may take courses for graduate credit. A maximum of nine semester hours or twenty-five percent of the semester hours required for the degree concerned (exclusive of residence or thesis credit), which ever is greater, may be transferred from post-baccalaureate status to any degree program leading to an advanced degree at this institution provided a grade of A or B has been earned. All transfers of credit hours to a graduate program must be approved by the program's Director of Graduate Studies and the Graduate Dean. (See section on Transfer of Credit.)

An application for admission to The Graduate School as

a post-baccalaureate graduate student should be on file in the Admissions Office at least 30 days in advance of the registration date for the term in which the student plans to enroll.

Post-baccalaureate students who wish to apply for a graduate program must have a 3.0 grade point average on all work attempted as post-baccalaureate students. A written notice should be presented to The Graduate School requesting consideration for admission to a program and stating the semester for which enrollment in the program is planned. Calendar deadlines in the front of this Bulletin should be observed.

Permission to enter any graduate class as a post-baccalaureate student will be granted only if the student meets the prerequisites and **if space is available.**

Provisional Admission

Students wishing to pursue an advanced degree who are temporarily ineligible for regular graduate admission status may be recommended by the Director of Graduate Studies for provisional admission status for one or more of the following reasons:

1. Missing transcripts or other requirements for admission such as letters of recommendation;
2. Temporary waiver of the Graduate Record Examination (not to exceed one semester);
3. Deficiencies determined by the program;
4. Temporary ineligibility for regular admission status because program only reviews applications once a year;
5. Graduating University of Kentucky seniors lacking no more than six hours for graduation; the consent of the college dean and the Dean of The Graduate School and approval of the Director of Graduate Studies are necessary. Students may take no more than 12 credit hours and must complete the undergraduate degree during the semester in which they enroll in the provisional status. (See section on Graduating Seniors as Part-Time Graduate Students.)

Provisional status is permitted for a maximum of one full-time semester or up to 12 hours after which the work will be reviewed, and, within 30 days into the following semester, and on recommendation of the Director of Graduate Studies, the status will be moved automatically from provisional to regular program status, or removed from the provisional status entirely.

Visiting Students

Students who are enrolled in a graduate program at another institution and plan to attend the University of Kentucky as Visiting Students need not submit transcripts. Students must, however, request a Visiting Student form from The Graduate School office when filing an application. Visiting Student admission is for one semester only and credit earned in that status is not applicable to a University of Kentucky degree.

Health Service

The convenience of an on-campus health care facility, a low-cost prepaid plan for outpatient services, and an excellent student group hospitalization plan which includes a

broad major medical component—all are designed to make UK's total health plan attractive and economical for graduate and professional students, both full-time and part-time.

All full-time students pay a \$50 health fee in fall and spring semesters which entitles them to medical and mental health care at the Student Health Service. Part-time students may prepay the health fee or may use the Health Service on a fee-for-service basis. If they elect to pay fee-for-service it is always more expensive.

The Student Health Service is located in the new Medical Plaza across Rose Street from the Medical Center. Entrance is just below the overhead walkway. Look for the Wildcat blue door on the first floor. The Health Service clinic hours are from 8 a.m. to 4:30 p.m. Monday through Friday, and Saturday morning, 9 to 11 a.m. Students can be seen in a minimum of time on a walk-in basis. The clinic is staffed with physicians, surgeons, nurses, psychiatrists, and other health professionals who are specialists in the health problems of young adults. There are no Saturday hours during breaks and during the summer sessions. On Saturday students should enter the Medical Plaza through the Rose Street entrance.

Part-time students who wish to pay the health fee may do so by writing a check made out to the University of Kentucky in the amount of \$50 and enclosing it with their tuition payment (by mail or at the Student Billing office) or they may pay the Health Service cashier before the deadline for paying all fees. Check with the Graduate School Office or the International Student Office if there are questions about eligibility or about paying the health fee.

The non-student spouse of an eligible student may use the Health Service but is not eligible to pay the health fee. The minimum charge for a non-student is \$18 per visit.

Services covered by the health fee include: unlimited visits to physicians and nurses for an illness or first-aid care, laboratory services, certain x-ray services, some medications, allergy shots and immunizations, unlimited visits to the professionals in the Mental Health Service, some after-hours emergency services and more.

Health Insurance

Services provided through campus facilities that are traditionally covered by insurance plans (hospitalization, accident x-rays, surgical procedures) will be billed to the student's insurance carrier. UK foreign students must have hospitalization insurance that is payable in the United States, and are responsible for any amount which insurance does not pay on these types of charges. It is imperative that students have insurance for themselves, and for their spouse and children if they are married, because of the extremely high cost of medical care. The University, including University Hospital, assumes no responsibility for a student's medical expenses.

As a service to students who need insurance of their own, the University has made arrangements for an excellent group insurance plan at reasonable student-age group rates. The current plan is a basic comprehensive plan with an optional major medical available. The plan provides a year-round coverage wherever the student may be as long as the semi-annual premium payments are maintained. There are two options available:

(1) Student only

(2) Student/Spouse (with limited maternity benefits)
(Maternity benefits available when conception occurs after initial premium paid.)

Dependent children may be covered based on a rate per child/dependent.

Note: All options have a nine-month waiting period before pre-existing conditions are covered.

There are definite sign-up periods for the UK Group Insurance Plan:

- (1) The first 30 calendar days of the fall semester for students attending that semester.
- (2) The first 30 calendar days of the spring semester for students attending that semester.
- (3) The first 10 calendar days of the 8-week summer session for students attending that session AND the subsequent fall semester.

Coverage begins for new enrollees when premium is received by either the insurance company or the delegated representative of Student Health Services.

Continuing enrollees have a 30-day grace period for enrolling with no interruption of coverage.

Information is also available through the Insurance Office of the Student Health Service (606) 233-6356 and through The Graduate School Office and the International Student Office. Questions relating to eligibility for the plan should be directed to any of the offices listed above.

IMPORTANT HEALTH SERVICE PHONE NUMBERS

General Information	233-5823
Mental Health Service Appointments	233-5511
Health Fee Information	233-6356
Insurance Information	233-6356
Billing Problems	257-5390
Administrator	233-5355
Ombudsman	233-5355

Counseling and Testing Center

The University Counseling and Testing Center has a staff of trained psychological counselors whose primary function is helping students work through educational, vocational and personal concerns. Some typical concerns for graduate students include: learning to read and think more critically, time management, difficulties in decision-making, career and life planning, quality of interpersonal relationships, feelings of depression, anxiety, loneliness, and other issues of a personal nature. All counseling sessions are voluntary and confidential. Tests of intelligence, achievement, personality, vocational interests, study skills and others may be used by the student to aid in self-understanding.

In addition to counseling with individuals, the Center staff provides marital, family, and group counseling. Groups are arranged each semester and include both general counseling groups, in which students may work on a variety of issues, and special focus groups (assertiveness training, for example).

The services of the Center are available by appointment to all who are enrolled in the University as well as to faculty and staff. There are no fees for the testing or counseling of University undergraduate or graduate students. Appointments and further information may be obtained by calling 257-8701 or by coming to the Center, 301 Frazee Hall.

Housing

General Information

The University of Kentucky Housing Office operates a total of 721 apartments for full-time single graduate students and student families. Full-time graduate and professional students have available to them 315 of these apartments. Sixteen efficiency apartments located at 404 Linden Walk are restricted to undergraduate international students. The remaining 390 apartments are available for student family housing. These apartments are rented on a 12-month lease agreement basis, including academic recesses.

The apartment complexes are in six different areas. They are: Commonwealth Village; Cooperstown; Shawneetown; Linden Walk; Rose Lane and Greg Page Stadium View. These complexes consist of efficiency and one-bedroom apartments except for Shawneetown which has 18 two-bedroom units, and Greg Page Stadium View, which has 48 two-bedroom apartments.

APPLICATION STEPS FOR UK APARTMENT HOUSING

1. Fill Out Enclosed Application For Apartment Housing and return to Apartment Housing Office with \$150 deposit.
2. Receive acknowledgement of deposit received.
3. Receive notification of apartment assignment or waiting list assignment from Apartment Housing Office.
4. If assigned to apartment, respond with confirmation or cancellation WITHIN TEN DAYS in order to keep assignment or receive full refund of deposit.
5. Arrive at UK Apartment Housing by specified date of occupancy. Sign 12-month Rental Agreement or Sub Lease and fulfill all terms therein. NOTE: LESSEE MUST BE ENROLLED AS A FULL-TIME UK STUDENT.

Furnishings

The one and two-bedroom units have a living room, kitchen, dining area and a bathroom. The efficiency apartments have a living room-bedroom combination, kitchen and bath.

Most kitchens and dining areas are furnished with a range, refrigerator, four chairs, and a table or bar counter. The living rooms are partially furnished with a sleeper couch plus lounge chair. The bedrooms have either a full-size bed or two twin beds and adequate drawer space.

The Greg Page Stadium View apartments are furnished differently in the living room and bedrooms. They have a settee, two lounge chairs, and two end tables in the living room. The bedrooms have night stands and either a full-size bed or two twins.

If an unfurnished or partially furnished apartment is desired, arrangements must be made with the Apartment

Housing Office to have any furniture moved. (The only exceptions are the Englisher couch/beds at Commonwealth Village. These cannot be removed.)

Waterbeds are not permitted in any UK apartments. It is recommended that students bring their own lamps and wait until moving in for other accessories.

Apartment Assignments

Apartment assignments are made according to the date the completed application is returned to the Apartment Housing Office with a \$150 reservation/security deposit. Priority will be given to returning residents. *Filing an application does not guarantee an assignment, nor does it in any way coincide with or affect admission to the University. Once an assignment is confirmed with the applicant, cancellation or failure to occupy the apartment will result in forfeiture of the deposit.*

All assignments are made on a single-occupancy basis, except at the 404 Linden Walk apartments for international undergraduates. At 404 Linden Walk, separate leases will be signed by both residents of the apartment.

The minimum occupancy for the two-bedroom apartments is a family of four; the maximum is a family of six. However, since the University has only 59 two-bedroom apartments, families of four are normally required to accept a one-bedroom apartment and place their names on a waiting list to transfer to a two-bedroom when available.

Families of three are normally assigned to one-bedroom apartments. After assignments are made, the remaining one-bedroom apartments will be offered to families of two (i.e., living in an efficiency apartment) who have placed their names on a waiting list. The maximum occupancy for a one-bedroom apartment is a family of four.

Payments

Rent payment, which includes all utilities, is due the first day of each month. Payments must be received in the Apartment Housing Office on or before the 10th of each month, or a \$15 late fee will be assessed. If a student moves in any time other than the first of the month, the rent will be prorated for the days occupied. Rent begins when the apartment keys are picked up.

The student renting the apartment is responsible for a complete 30-day written notice to vacate when he or she decides to move out at the expiration of the lease. Permission must be granted for the 30-day notice to be permitted during the time the lease is in effect.

Deposit

The \$150 reservation/security deposit is placed in a non-interest bearing account until the termination of the lease. The deposit, less any charges for cleaning, rent, missing or damaged property, will be refunded within 30 days after the resident moves out.

Cancellations and Refunds

If an application is withdrawn prior to receiving an assignment, or within 10 days after an assignment is made, the deposit will be refunded. If an apartment is not available, the application will be cancelled and the deposit will be refunded.

Upon request, an application and deposit will be held for consideration as apartments become available. A refund of

the deposit will be made if the student is refused admission to the University and the Cooperstown Office is notified in writing within 30 days after notice of rejection from the Admissions Office.

Meal Contracts

Contracts for board only are available during fall and spring semesters from the UK Food Services Department.

Board is provided only according to the undergraduate academic year. Payment is made each semester according to the Undergraduate Housing Payment Plan. After you arrive, contact the University Housing Office for a meal contract application.

Housing Office
125 Funkhouser
University of Kentucky
Lexington, KY 40506
(606)257-1866

Telephones

Telephones are not provided by the University. If a phone is desired, contact Communications Services, Room 108 Parking Structure #2, (606) 257-8086.

Note: Rose Lane and Linden Walk residents must contact GTE for telephone service.

Parking

Parking is restricted in all apartment complex lots and permits may be purchased from the Public Safety Division, located at the corner of Rose Street and Euclid Avenue. You must show a copy of your lease or sublease to them in order to obtain a permit.

Custodial Service

Students are required to keep apartments in a clean and sanitary condition. University custodial staff maintains only the public areas.

Pets

Pets are not allowed in apartments or in the University housing areas.

Bus Service

Any point on campus may be reached easily by riding the free University shuttle bus which runs every 20 minutes. The bus passes within one block of the apartments.

Carpets

Carpets in all University apartments are cleaned before residents move in. Once a resident occupies an apartment, carpet cleaning and care is the resident's responsibility. Carpet cleaning machines can be rented at local grocery and hardware stores.

Roommate Subleases

If a single graduate student desires to have another single graduate student of the same sex reside with him or her, a sublease must be signed by the second student through the Apartment Housing Office. Information concerning the sublease is explained in the Rental Agreement.

Graduating Seniors as Part-Time Graduate Students

Seniors in the University of Kentucky lacking no more than six credit hours for graduation and having an undergraduate average of at least 2.5 on all work attempted may register in The Graduate School in the provisional status with the consent of the undergraduate college dean, the appropriate Director of Graduate Studies, and the Dean of The Graduate School. *The total load of such students may not exceed 12 credit hours.* Graduate credit will be allowed for each credit hour of graduate work beyond the six or fewer credit hours needed to complete undergraduate requirements. Requirements for the undergraduate degree must be completed during the semester in which the students are allowed to register for part-time graduate work. Students applying for admission to The Graduate School under these conditions must fill out a petition form listing the course or courses to be taken to complete the undergraduate requirements. Petition forms are available in The Graduate School office.

University Scholars Program (Combined Master's/Bachelor's Degree Program)

There are among students at the University of Kentucky some particularly gifted and highly motivated students whose well-defined academic and career plans include graduate or professional study.

The University Scholars Program offers these students the opportunity and the challenge of integrating their undergraduate and graduate or professional courses of study in a single continuous program culminating in both a baccalaureate and a master's degree.

Interested students should contact the Director of Admissions and Records, The Graduate School.

Changes in the Graduate School Requirements

When Graduate School or degree program requirements are changed after a course of study has begun, the students shall have the option of fulfilling either the old or new requirements.

If the students elect to fulfill the old requirements but find that necessary resources (e.g., courses, instruction in particular skills) are no longer available, they may make reasonable substitutes with the approval of the Graduate School Dean upon recommendation of the Director of Graduate Studies.

In the event that students interrupt their work on a graduate degree (i.e., not enrolled) for one calendar year or more, the Graduate School Dean shall determine, upon recommendation of the Director of Graduate Studies, whether the old requirements or the new requirements shall apply. In the event students have not completed the requirements for the graduate degree five years after the effective date of a change in degree requirements, the new requirements shall apply unless determined otherwise by the Graduate School Dean.

Advanced Degrees for Faculty Members

Members of the faculty, excepting those in the Community College System, having a rank higher than that of Instructor, may not be considered as candidates for degrees in the discipline in which they are employed and hold academic rank or as candidates for degrees above the master's degree at the University.

Faculty members pursuing degrees above the master's degree at the University may not hold more than a half-time work assignment either during the two full-time, consecutive resident semesters preceding qualifying examinations or during the two semesters of full-time dissertation study immediately following the qualifying examination.

University of Kentucky Libraries

The University of Kentucky Library, one of the nation's top research libraries, contains approximately 1,962,733 volumes, 2,865,988 microform units, and 12,800 linear feet of manuscripts. The collection also includes 177,547 maps, 9,650 music records, and 250,610 pictures, tapes and miscellaneous items. The Library currently subscribes to 22,242 periodicals including 284 foreign, domestic, and Kentucky newspapers and government documents.

Strong emphasis is placed on the development of a high-quality collection responsive to the teaching and research needs of the University. The obligation to secure resources for the future needs of the academic community is also recognized. The collection is particularly strong in bibliography, history, coal, science and technology, agriculture, law, literature, and languages. Branch libraries housing special collections include agriculture, biological science, chemistry and physics, law, architecture, geology, engineering, mathematical sciences, art, education, medicine, and music.

The Library is responsible for locating and obtaining for its scholars needed research materials not available in its collection. These materials are borrowed from other research libraries through interlibrary loan. Other services include reference, government documents, on-line computerized literature searching, individualized instruction in library use, academic information and referral, and replication of materials in both microform and hard copy.

Information booklets and guides to the Library and its resources are available at the King Library Circulation Desk in the Reference Department and at the individual branch libraries.

During fall and spring semesters King Library is open from 8 a.m. until 12 midnight, Monday through Thursday; 8 a.m. until 10 p.m. on Friday; 8 a.m. until 8 p.m. on Saturday, and 10 a.m. until midnight on Sunday. Certain branches within the Library System have shorter schedules. Hours of service may be obtained by contacting any of the following branches:

Branch and Associate Libraries

Agriculture	N24 Agricultural Science Center	
	North	257-2758
Architecture	200 Pence Hall	257-1533
Art	King Library North (lower level)	257-3938
Biological Sciences	313 Thomas Hunt Morgan Building	257-5889

Chemistry-Physics	150 Chemistry-Physics Building	257-5954
Education	205 Dickey Hall	257-7977
Engineering	355 Anderson Hall	257-2965
Geology	100 Bowman Hall	257-5730
Journalism		
Reading Room	112 Journalism Bldg.	257-7818
Law	128 Law Building	257-8687
Mathematics	9 Patterson Office Tower	257-8365
Medical	135 Medical Center	233-5300
Music	116 Fine Arts Building	257-2800

INFORMATION AND REQUIREMENTS FOR ALL ADVANCED DEGREES

Registration and Classification

All students expecting graduate credit must be enrolled in The Graduate School. Graduate students will conform to the general registration schedule of the University and may not enter later than the last allowable date set by the Registrar.

Before registering, graduate students must obtain their adviser's approval of their proposed program.

Fees

Semesters: Fall and Spring

Full-Time Student	Resident	Non-resident
Graduate School	\$750	\$2,250
Part-Time Student		
Graduate School		
(per hour fee)		
Summer School Terms:		
Full-Time Student	Resident	Non-resident
(Eight-Week Session only)		
Graduate	420	1,250
Part-Time Student and		
Four-Week Session		
(per hour fee)		
Graduate	84	250

Four-Week Session:

Four credit hours is the maximum course load and fees will be assessed separately per hour.

Eight-Week Session:

Full-time fees are attained at five hours for The Graduate School.

FEES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Graduate Record Examination

All applicants for admission to degree programs in The Graduate School must submit scores on the verbal and quantitative portions of the Graduate Record Examination. This rule may be waived for one semester in individual cases upon recommendation of the Director of Graduate Studies in the individual department or program. But in cases where waivers are granted, the GRE scores must be submitted before the end of the first semester of graduate study. (See section on Provisional Admission.) The advanced portion of the GRE may be required by individual departments or programs if they so desire. (This excludes students who do not plan to work toward a graduate degree, i.e., Visiting Students, Rank 1, Fifth-year, and Post-baccalaureate students.)

The College of Business and Economics substitutes the Graduate Management Admissions Test (GMAT) for the Graduate Record Examination for M.B.A., D.B.A. and Accounting students. Also, applicants in Public Administration may substitute the GMAT.

The Medical College Admission Test may be substituted in appropriate areas for the verbal and quantitative portions of the GRE with the approval of the Dean of The Graduate School. The Dental Admission Test may be substituted for the GRE for students pursuing the Master of Science in Dentistry with the approval of the Dean of The Graduate School.

Students who have earned an academic doctorate are exempt from the requirement of the MCAT or the GRE.

Graduate Courses

All courses numbered 500 through 799 may be counted for credit toward a graduate degree provided they are approved as an appropriate part of the student's graduate program by the student's graduate adviser or committee. Courses numbered 400G to 499G carry graduate credit for non-majors only.

Courses numbered 800 or 900 are normally not accepted for credit toward a graduate degree. Exceptions can be made if permission is granted by the Graduate Council to a program to offer specific professional courses as part of its academic program. Prior approval to take a course must be obtained from the Director of Graduate Studies, the Dean of The Graduate School and the dean of the professional college. Without such approval professional courses may not be counted toward satisfying degree requirements. Courses numbered at the 600 or 700 level should be taught by members of the Graduate Faculty or by such other instructors as are approved by the Graduate Dean.

Add/Drop-Withdrawal

The Graduate School follows the rules of the University Senate as administered by the Registrar's office.

Grades-Grade Average

The official grades of graduate students are recorded in the office of the Registrar.

The grading in graduate courses is done according to the following scale:

A-High achievement	4 grade points per credit
B-Satisfactory achievement	3 grade points per credit
C-Minimum passing grade	2 grade points per credit
E-Failure	0 grade points per credit
I-Incomplete	See explanation following
S-Satisfactory	See explanation following

D grades are not awarded to graduate students. Graduate courses (400G-799) may not be taken Pass/Fail.

A grade of I (incomplete) may be assigned to a graduate student if a part of the work of a course remains undone and there is a reasonable possibility that a passing grade will result from completion of the work. **All incompletes (I grades) must be removed from a student's record unless approved by the Dean of The Graduate School.**

A grade of S (satisfactory work in progress) may be recorded for students in graduate courses which carry no credit and in graduate seminars, independent work courses, and research courses which extend beyond the normal limits of

a semester or summer term. The grade may not be given to a student in a course carrying credit if the student has done unsatisfactory work or failed to do a reasonable amount of work. The project must be substantially continuous in its progress. All S grades must be removed (Exception: Residence Credit 768 and 769).

An over-all average of B on all graduate work in the program must be attained before an advanced degree may be awarded. Graduate level courses (400G-799) are computed in the graduate grade-point average. (See section on Repeat Option.)

Once a grade (other than an I or S) has been reported to the Registrar's office, it may not be changed unless an error was made at the time the grade was given and recorded, and then only upon the written unanimous approval of the instructor, the Registrar, and the Dean of The Graduate School.

Scholastic Probation

When students have completed 12 or more semester hours of graduate course work with an average of less than 3.0, they will be placed on scholastic probation and are subject to dismissal from their programs.

Students will have one full-time semester or the equivalent (9 hours) to remove the scholastic probation by attaining a 3.0 average. If probation is not removed, students will be dismissed from The Graduate School.

Students who have been dismissed from The Graduate School for these reasons may apply for readmission to The Graduate School after two semesters or one semester and the eight-week summer term. Readmitted students will have one full-time semester or the equivalent (9 hours) to remove the scholastic probation by attaining a 3.0 average.

Exceptions to this policy can be made only by the Graduate Dean.

Termination

The Dean of The Graduate School may terminate enrollment in a particular program for the following reasons:

1. Academic probation for three enrolled semesters.
2. Having failed twice the final examination for the master's degree or the qualifying examination.
3. In cases where the student's Advisory Committee recommends termination after the qualifying examination has been passed, the Graduate Faculty in that program will meet to vote on the recommendation. When the Graduate Faculty of that program concurs and the student dissents, the student will have an opportunity to meet with the Graduate Faculty of the program, after which a second vote will be taken and a final recommendation will be made to the Dean of The Graduate School.

Each program sets specific requirements and standards of performance, evaluative procedures and criteria, and procedures for terminations. The student should be informed of these criteria at the time of enrollment by the Director of Graduate Studies of the program.

Repeat Option

A student may repeat a graduate course and count only the second grade as part of the graduate grade point average.

This action will be initiated by petition of the Director of Graduate Studies to the Graduate Dean, and may be done only once in a particular degree program or in post-baccalaureate status. Repeat Option requests must reach the Dean of The Graduate School **no later than the last day for dropping the course without a grade of any kind appearing on the transcript.** (This is three weeks following the first day of classes in the regular semesters.)

Credit Equivalence

Certain research courses carry no credit hours or grades but do contribute to the residence requirements of graduate degrees. For these courses the credit equivalent is stated in the course descriptions.

Academic Load

The total semester or term load of a student is the sum of all credits and credit equivalents (e.g., graduate language courses, undergraduate courses, courses audited, etc.) being carried. The normal load of a graduate student during any semester is 9 credit hours or equivalent. Under no circumstances may it exceed 15 credit hours or equivalent. During the summer term, the maximum load for the eight-week term is nine credit hours, and the four-week intersession is four credit hours. The maximum load for any combination of the four and eight-week terms is 12 credit hours.

Students satisfactorily completing nine course credits, or equivalent, of graduate level work during a semester, are classified as full-time students. Students satisfactorily completing six course credits, or equivalent, during a summer term are classified as full-time. Those completing less than these amounts are classified as part-time except that a teaching or research assistant may be classified as full-time for residence credit purposes (See Residence Requirements Section) by taking six semester hours if the Director of Graduate Studies recommends and the Dean of The Graduate School approves. For the student who is a full-time teaching assistant or whose service to the University requires approximately 20 hours per week, the load shall not exceed 10 hours. This maximum may be increased to 12 hours for students with lighter service loads upon recommendation of the Director of Graduate Studies and approval of the Dean of The Graduate School.

Full-time students who fall below the minimum full-time equivalent as the result of failing or dropping one or more courses are reclassified as part-time students for that semester or term.

Master's candidates working on their theses may register for up to the equivalent of 12 course credits by signing for course 768 in the appropriate department and indicating the desired credit equivalent in parentheses on the registration card. Plan A Master's degree candidates who are in residence and receiving financial support from the University and/or utilizing University resources while working on the thesis must be enrolled in The Graduate School. Candidates not enrolled in course work to meet degree requirements must be enrolled in 768 for at least one credit hour each semester.

Persons holding full-time working or professional assignments, whether employed by the University or not, may not take more than six credit hours (excluding 769 courses) for graduate credit toward a degree in any single semester or term. Students may petition for

a waiver of this rule when the following conditions are met: (1) has satisfactorily completed six credit hours of graduate work; (2) has attained higher than national average scores on the aptitude and advanced tests of the Graduate Record Examination; and (3) has appropriate employment facilities and conditions.

Special Examinations in the Student's Program

A special examination for graduate credit requires the approval of the Dean of The Graduate School. Request for approval is initiated by letter from the Director of Graduate Studies in the student's program.

Following approval, students must complete the Special Examination form (available in the Registrar's Office), have it approved and signed by the Director of Graduate Studies and the Graduate Dean. Students must be enrolled in The Graduate School during the semester they wish to sit for a special examination.

Students Changing Programs

Students who plan to change to another program must have the consent of the Director of Graduate Studies in the new program. A letter of acceptance must be sent to The Graduate School. Also students must request by letter that the change be made by The Graduate School.

Off-Campus and Short Courses

Short courses are defined as courses of less than a term in length. A short course may not carry credits greater than the number of weeks during which it is offered. Two short courses of four weeks or less may not be taken simultaneously. Two full-term courses and a short course may not be taken simultaneously.

Instructional standards for off-campus and short courses should be the same as those established for on-campus and regular courses. A comprehensive final examination will normally be required to assess the student's capability for scholarly thinking in the subject matter area. Practicum or laboratory courses should require other experiences of comparable rigor.

Visiting Students

University of Kentucky graduate students who attend another graduate school as a Visiting Student must have the permission of their University of Kentucky advisers **before** the courses are taken in order to transfer credits earned. (See Transfer of Credits Section.)

Visiting Student status may be granted **only** to a student who is in good standing in a program.

Time Limit for Degrees

Activities which are used to satisfy degree requirements must be completed within eight years preceding the proposed date of graduation. Extensions of time will be considered by the Graduate Council only upon written recommendation by the appropriate Director of Graduate Studies. No activity completed more than 12 calendar years preceding the proposed graduation date will be considered for graduation.

Graduation

Advanced degrees may be conferred at the close of any semester or summer session, but commencement exercises are held only at the close of the academic year. Students who are eligible to receive degrees at the end of the summer session or the first semester may participate in the next commencement exercises.

Appropriate academic costume must be worn.

The thesis and dissertation fees cover the cost of binding of the thesis or dissertation, microfilming, and copyright (See section on copyright). Authorization forms to pay dissertation fees are issued in Room 331, Patterson Office Tower. Diplomas will not be released from the Registrar's Office until the fees have been paid.

To be eligible for a degree, students must file an application in The Graduate School office within 30 days after the beginning of the semester or 15 days in the Summer Session in which they expect to complete their work.

Diplomas

Diplomas for graduate students are ordered after certification of the degree has been completed. If a letter of certification is needed, The Graduate School will provide one on request.

Accounts Payable to the University

All outstanding accounts due to the University must be cleared before a degree is awarded. Candidates for degrees, whose accounts are cleared close to the final deadline date for graduation clearance, should take their receipt of payment to the Registrar's office.

GENERAL REQUIREMENTS FOR ALL MASTER'S DEGREES

(See also General Requirements for All Advanced Degrees)

On-Campus Residence

There is no Graduate School-wide sustained residence requirement for master's degrees at the University of Kentucky. However, students are advised to consult the special statement of requirements for the programs in which they are interested and consider carefully the statement about the spirit of resident graduate work in the section on residence. Students who contemplate continuing in a doctoral program should take into account at the outset the residence requirements for the doctoral degree.

Foreign Language Requirement

Many programs require a reading knowledge of a modern foreign language for the master's degree. French, German, or Russian are the normally accepted languages. However, another modern language pertinent to the student's program may be substituted on the recommendation of the adviser and with the approval of the Director of Graduate Studies and the Graduate Dean. The language requirement may be satisfied by:

1. Completing one of the accelerated graduate level language

courses with a B or better grade.

2. Completing the Educational Testing Service examination with a minimum score of 450.
3. Completing the fourth semester of a foreign language with a grade of B or better as an undergraduate at an accredited college or university.
4. Completing, with a grade of B or better, Special Examinations given for the graduate reading courses. Forms may be obtained from the Registrar's Office, Gillis Building. Other types of special examinations are scheduled in The Graduate School Office. Examinations to test out of Russian must be arranged through the Department of Russian.
5. Transferring a language taken to satisfy the requirements for a master's degree at another university.

Note: With the approval of their program to use their native language, international students who are non-native speakers of English, may satisfy the foreign language requirement by presenting a TOEFL score of 550 or above.

Candidates for degrees must be proficient in English.

Transfer of Credits

With the approval of the student's adviser, or major professor, the Director of Graduate Studies, and the Graduate Dean, a maximum of nine semester hours or twenty-five percent of the semester hours required for the degree concerned (exclusive of residence or thesis credit), whichever is greater, of regular graduate course credits, completed at an accredited university and earned prior to admission to a given graduate degree program, may be credited toward the minimum requirements of the Master's or Specialist degree in that graduate program provided that the grades earned were A or B. For example, such credits may be earned (1) as a student in another graduate program at the University of Kentucky, or (2) as a graduate student at another accredited graduate school. In the event a student offers credits in more than one of these categories, the total to be credited toward the degree still may not exceed nine hours or twenty-five percent of the semester hours required for the degree concerned (exclusive of residence or thesis credit), whichever is greater. In no case will independent work, research, thesis or dissertation credit completed as part of degree requirements for one program be considered to satisfy requirements of a subsequent master's program.

Independent Study Programs

(Correspondence Courses)

No graduate credit is given for courses taken by correspondence.

Courses and Curricula

Graduate students are eligible to take regular courses which meet as organized classes and independent-study or research courses in which each student carries on investigations independent of class meetings. *Independent study or research courses must not duplicate thesis work*; thesis work must be done in addition to the minimum course requirements. *At least two-thirds of the minimum requirements for the master's degree must be in regular courses, and at least half of the minimum requirements must be in courses numbered on the 600 or 700 level.* Exceptions to this rule may be made only with the approval of the Graduate Council.

Concurrent Degree Programs

Concurrent enrollment for degree purposes in more than one graduate program is permitted only with the approval of the student's Graduate Adviser(s), Directors of Graduate Studies in the programs, and the Dean of the Graduate School.

Subsequent to the receipt of a doctoral degree, a student is not eligible to receive a master's degree based on the work which led to the doctorate.

Final Examination

Final examination (oral and/or written) is given to all candidates for master's degrees not later than eight days before the last day of classes of the semester in which the degree is to be awarded. The examination is scheduled by the Graduate Dean and the report is returned to the Dean upon completion of the examination, which in no case may be later than two weeks after the start of the examination. The examining committee consists of at least three qualified members recommended by the Director of Graduate Studies and appointed by the Dean of The Graduate School. At least one member must be a member of the Graduate Faculty and one must hold an associate appointment. The recommendation for a final examination must be filed with The Graduate School at least two weeks prior to the date of the examination. (Students writing theses should see the section on Thesis/Non-Thesis Option.)

If the candidate fails the final examination, the committee may recommend to the Graduate Council the conditions under which a second examination may be administered. Insofar as it is practicable the same examining committee gives this examination. In all decisions the majority opinion of the committee prevails. If the committee is evenly divided, the candidate fails. A third examination is not allowed.

Thesis/Non-Thesis Options

The Graduate Faculty authorizes all graduate programs to satisfy the master's requirements by either of two options, thesis (Plan A) or non-thesis, (Plan B).

The Thesis option (Plan A) requires a thesis to be developed under the direction of a member or associate member of the Graduate Faculty. Collaborative effort by two or more graduate students is not forbidden. However, there must be enough independent effort to enable each student to make a separate contribution and to prepare an individual thesis.

Theses must be in conformity with the instructions prepared by The Graduate School. For specific instructions regarding the format of theses, the student should obtain a copy of the leaflet, *Instructions for the Preparation of Theses and Dissertations*, from The Graduate School office.

Before the final examination the thesis director and the appropriate Director of Graduate Studies must indicate to The Graduate School that the student's thesis satisfies all requirements of The Graduate School and is complete in content and format with the exception of pagination, and that the student is ready to be examined. Any modification in the thesis which the final examination committee specifies must be made if the student has passed the final examination.

The final copies are submitted to The Graduate School after the Director of Graduate Studies and the Thesis Direc-

tor have signed that they are complete.

Theses must be presented and accepted by The Graduate School by the last day of the semester if a student plans to graduate that semester.

Each student must pay a fee for the binding of the thesis. Payment will be made at the Billings and Collection office.

Theses submitted by candidates become the physical property of the University of Kentucky and authors agree that the University may decide the conditions under which they may be used or published. The University protects the authors' rights by placing certain restrictions upon borrowers' use of theses as long as they are unpublished. A copy of the following regulations (to be prepared by the student) is placed before the title page of every thesis:

Unpublished theses submitted for the master's and doctor's degrees and deposited in the University of Kentucky Library are as a rule open for inspection, but are to be used only with due regard to the rights of the authors. Bibliographical references may be noted, but quotations or summaries of parts may be published only with the permission of the author, and with the usual scholarly acknowledgements.

Extensive copying or publication of the thesis in whole or in part requires also the consent of the Dean of The Graduate School of the University of Kentucky.

A library which borrows this thesis for use by its patrons is expected to secure the signature of each user.

The non-thesis option (Plan B) requires that six or more graduate credit hours of course work be submitted in lieu of a thesis. A student may follow this option with approval of the program concerned.

GENERAL REQUIREMENTS FOR ALL DOCTORAL DEGREES

Degree of Doctor of Philosophy

The Ph.D. degree is intended to represent the demonstration of independent and comprehensive scholarship in a specific field. Such scholarship must be manifested by both the student's mastery of subject matter and capacity to do research.

The degree of Doctor of Philosophy is conferred upon a candidate who after completing graduate work devoted to study of a special field of knowledge (1) passes comprehensive examinations in the chosen field and the dissertation subject, (2) presents a satisfactory dissertation, and (3) shows evidence of scholarly attainment.

Students should note that some doctoral programs have degree requirements that may exceed the minimum requirements of the Graduate Faculty.

The Major Professor and Advisory Committee

Each student's program is guided by a Major Professor and Advisory Committee throughout the graduate career. Their purpose is to give continuity of direction and counsel and provide intellectual stimulation from the earliest days of residency through the completion of the doctorate.

The Director of Graduate Studies, or designee, serves as adviser to beginning graduate students, signs schedule cards and performs other advisory functions until the Advisory

Committee is appointed, normally not later than upon completion of 18 credit hours of graduate work. The Advisory Committee must be appointed at least one year prior to the Qualifying Examinations. The Major Professor and Advisory Committee are appointed by the Graduate Dean after consultation with the appropriate Director of Graduate Studies. The Dissertation Director, when selected, serves as the Major Professor. The Advisory Committee also provides advice to the student and specifically sets requirements (within applicable program, Graduate School, and University regulations) which the student must meet in pursuit of the doctorate.

The Advisory Committee has a core of five members. This core consists of the Major Professor as Chairman, two or three other members from the major area, and at least one representative from any minor area(s). At least one representative must be from outside the academic program (department). All members of the core must be members of the Graduate Faculty of the University of Kentucky and three (including the Major Professor) must possess full Graduate Faculty status. Additional faculty members may serve as members of the Advisory Committee. The core of the Advisory Committee must be kept at its full complement throughout the graduate career of the individual student. Thus, in the event of a vacancy on the Committee (occasioned by resignation, faculty leave, or inability to serve), an appropriate replacement must be made prior to the making of any committee decision.

All decisions of the Advisory Committee are by majority vote of its Graduate Faculty members. Advisory Committee decisions must be reported promptly to the appropriate Director of Graduate Studies who will be responsible for transmitting them to the Dean of The Graduate School.

In addition to advising and program planning, the Advisory Committee is also involved in the administration of the Qualifying Examination, the supervision of the preparation of the dissertation, and the administration of the Final Examination on the dissertation (see appropriate section below).

Major and Minor Subjects

Every applicant for the Ph.D. degree must select a major area of study. The major area is one in which the student's efforts are concentrated. Some programs also require one or more minor areas. Minor(s) must be approved by the student's Advisory Committee.

Residence Requirements

The purpose of a residence requirement is to encourage contact with the academic community in which doctoral students may become fully involved with colleagues, libraries, laboratories, on-going programs of research and inquiry, and experience the intellectual ferment which characterizes a university. Such experience is generally as important as formal classwork in the process of intellectual development. While the residence requirements are, by necessity, given in terms of full or part-time enrollment, the intent of the requirement is to ensure that the student becomes fully involved in an essential part of scholarly life.

Requirements for the doctorate may be completed in three years of full-time graduate work or the equivalent in combined full-time and part-time study;* however, more time

may be required. (See section on Academic Load.)

In unusual cases approval of a program of study involving less time may be secured from the Graduate Dean. It should be understood that scholarly accomplishment is the ultimate basis on which requirements are met, not semester hours completed or time spent in the program. On the recommendation of the Director of Graduate Studies and with the concurrence of the Graduate Dean, successful completion of a master's degree may be considered the equivalent of the first of the three years.

The following residence requirements must be completed.

1. Students pursuing the doctorate must spend at least two consecutive semesters enrolled in a degree program on campus in intensive study. Such enrollment must occur prior to passing the Qualifying Examination. During these two semesters the students must be enrolled as full-time students, carrying nine or more hours. If the summer term is to be used in lieu of one of these semesters, enrollment for nine hours is required.

Note: If students hold an awarded master's degree from the University of Kentucky in the same discipline and completed two consecutive full-time semesters while pursuing the degree, those semesters may be used in lieu of the above.

2. Students must complete a second year of residency in one or a combination of the following:
 - a. Transfer residence credit from an awarded master's degree from another school.
 - b. Complete a minimum of eighteen hours of work (part-time or full-time) beyond the two full-time consecutive semesters (See N.1).
 - c. Apply hours completed while pursuing a University of Kentucky master's degree.

Note: Students fulfilling No. 1 by use of a University of Kentucky master's may not fulfill No. 2 in this manner.

3. Candidates (students who have satisfactorily completed their Qualifying Examinations) for the doctorate must complete two semesters of full-time dissertation study **immediately** following the Qualifying Examination. Normally this is accomplished by registering for nine hours of 769 (which is called Residence Credit) each semester and completed with a grade of S. With the written recommendation of a candidate's Advisory Committee and with the approval of the appropriate Director of Graduate Studies and the Graduate Dean, specified graduate course work may be taken in lieu of all or part of this residence credit (769) requirement. If a summer term is substituted for one of the semesters, three credits must be taken in the four-week session and a minimum of six credits in the eight-week session. The student need not be physically present on campus while enrolled for credit after the Qualifying Examination. While there is generally no formal class work attached to these credits, and in some cases the student may not be on the campus, full tuition costs are assessed in that students who are preparing their dissertations are utilizing University resources such as libraries, Computing Center, and Major Professors' and Committee members' time and energy.

Note: The semester during which the student takes the Qualifying Examination may be counted for credit for dissertation study **only** if the date of successful passage is within six weeks (three weeks for the eight-week summer session) of the first day of classes.

4. Candidates who have fulfilled the above requirements, but who have not yet defended the dissertation, are required to enroll for 769 (0-9 credit hours) each semester until the dissertation is completed and defended. Such registration enables the

University to keep accurate records of degree candidates and facilitates rapid and accurate information processing. Some programs have additional residence requirements which must also be met.

It should be understood that the above represents the minimum requirements of The Graduate School. Some programs have additional requirements.

Exceptions to this normal pattern may be made with the approval of the Dean of The Graduate School upon the written recommendations of the student's Advisory Committee and the Director of Graduate Studies, which clearly demonstrates that the principle of residence is preserved.

*In those situations where part-time course work toward the doctorate may be used in lieu of full-time enrollment, each nine hours of course credit earned on a part-time basis is considered the equivalent of a full-time semester. This does not apply to the two full-time consecutive residence semesters preceding the Qualifying Examinations or the two residence semesters following the Qualifying Examinations.

Foreign Language Requirements

The language requirement for each doctoral program is listed under Degree Requirements. A reading knowledge of one modern foreign language is required by the Graduate Faculty. The language(s) normally accepted are French, German, or Russian. However, any modern foreign language more appropriate to the student's field of study may be selected on the recommendation of the Advisory Committee and with the approval of the Director of Graduate Studies and the Graduate Dean. Arrangements must be made through the Office of the Graduate Dean for examinations in languages not regularly taught at the University of Kentucky.

The language requirement must be satisfied before the applicant may be admitted to the Qualifying Examination. (See Foreign Language Requirements under General Requirements for all Master's Degrees.)

The Qualifying Examination

A Qualifying Examination consisting of both written and oral components is required of all doctoral students. Its purpose is to verify that students have sufficient understanding of and competence in their fields to become candidates for the degree. In most programs an individual Qualifying Examination is prepared and administered by the Advisory Committee; in some cases that committee also judges the results of the examination. A majority vote of the core of the Advisory Committee is required for successful completion of the Qualifying Examination. Programs which give uniform, written Qualifying Examinations to all of their candidates shall have rules (filed with the Graduate Dean) governing the role of the Advisory Committee in the preparation, administration, and evaluation of the Qualifying Examination. The examination is given usually after four semesters of graduate work or the equivalent.

The Qualifying Examination must be scheduled through the Director of Graduate Studies and approved two weeks in advance by The Graduate School. Failure to meet this scheduling requirement may result in students not having proper University status and can cause omissions in records, loss of credits, or delay of graduation. Students should check with the Director of Graduate Studies to make sure that the Qualifying Examination has been appropriately scheduled.

The results of the examination must be reported by the

Director of Graduate Studies to The Graduate School within 10 days of its conclusion. If the result is failure, the Committee determines the conditions to be met before another examination may be given. The minimum time between examinations is four months. A second examination must be taken within one year after taking the first examination. A third examination is not permitted.

The Dissertation

Each student must present a dissertation which represents the culmination of a major research project. The dissertation must be a well-reasoned, original contribution to knowledge in the field of study and should provide evidence of high scholarly achievement. The Major Professor is the primary source of guidance in the planning and preparation of the dissertation. However, other members of the Advisory Committee may be involved in the process as well. All core members of the Advisory Committee must read the dissertation prior to signing the Approval Form. It is the responsibility of the Advisory Committee to make suggestions for revisions before the Final Examination. A majority of the Advisory Committee core members must indicate that the form and substance of the dissertation are adequate to justify the scheduling of the Final Examination. The Final Examination on the dissertation may not be scheduled without the signatures of a majority of the Advisory Committee's members on the Approval Form.

The style and form of the dissertation must be in conformity with the instructions prepared by The Graduate School. For specific instructions regarding the format of the dissertation, the student should obtain a copy of the *Instructions for the Preparation of Theses and Dissertations* from The Graduate School Office.

Each graduating doctoral student will pay dissertation fees. Payment will be made at the University Billings and Collections Office. Authorization forms to pay dissertation fees are issued in Room 331, Patterson Office Tower.

Copyright

Dissertations may be copyrighted by the student by (1) signing the Copyright Authorization on the Microfilm Agreement Form which is completed after the dissertation format check in The Graduate School, (2) paying the copyright fee of \$20 (this copyright fee is in addition to the \$47 dissertation fee), and (3) including a copyright notice in the front of the dissertation. The notice is a single sheet on which is centered the heading.

Copyright by
(name of student)
(year)

The Final Examination

The Final Examination includes a defense of the dissertation and may be as comprehensive in the major and minor areas as the Advisory Committee chooses to make it. It is conducted by an expanded Advisory Committee chaired by the Director of Graduate Studies or someone designated by the Director. The Graduate Dean and President of the University are *ex officio* members of all final examination committees. The examination is a public event and its scheduling is published and announced beforehand. Any

member of the University community may attend.

At least four weeks prior to the Final Examination, following notification by the Major Professor that the dissertation has been distributed to members of the Advisory Committee, the Director of Graduate Studies will advise The Graduate School of the intent to examine. At this time the Graduate Dean appoints an Outside Examiner as a core member of the Advisory Committee. The specific time and date of the examination must be designated by The Graduate School at least two weeks prior to the actual examination. All members of the Committee except the outside Examiner have had an opportunity to suggest revisions prior to signing the Dissertation Approval Form. Thus, most revisions should have been completed at an earlier time. The Final Examination must take place no later than eight days prior to the last day of classes of the semester in which the student expects to graduate.

The Dissertation Approval Form, along with an acceptable copy of the dissertation, must be presented to The Graduate School at the time the Final Examination is established. The draft of the dissertation submitted must be complete in content, including all footnotes, tables, figures, and appendices. A full bibliography or set of references must be included as must a title page and abstract.

In all decisions, the majority opinion of the Graduate Faculty members of the Advisory Committee prevails. If the Advisory Committee is evenly divided, the candidate fails.

In the event of failure, the Advisory Committee recommends to the Graduate Dean conditions under which the candidate may be re-examined, if re-examination is deemed appropriate. When conditions set by the Graduate Dean have been met, the candidate may be re-examined. Should any vacancies on the Committee occur between the two examinations, the Graduate Dean shall appoint replacements. A third examination is not permitted.

After the Final Examination is passed, the final copy of the dissertation is prepared. Final copies are then submitted to The Graduate School along with the signatures of the Major Professor and the Director of Graduate Studies. The dissertation in its final form must be received in The Graduate School office within 60 days of the Final Examination. If this deadline is not met, the candidate must undergo a second examination.

Combined Medical and Graduate Studies

Students combining studies toward an M.D. degree and a Ph.D. degree in one of the established programs of The Graduate School must be admitted to both programs. Before applying for admission to The Graduate School applicants should consult with the Director of Graduate Studies of the graduate area of interest.

Guidelines for students wishing to pursue the combined M.D./Ph.D. degrees may be obtained in the office of the Director of Admissions and Records, The Graduate School.

University of Kentucky/Lexington Theological Seminary Double Competency Program

The Lexington Theological Seminary and the University of Kentucky have established a double competency pro-

gram to educate qualified students whose career interests are social work and the ministry. Interested students should contact their major adviser.

University of Kentucky/Asbury Theological Seminary Double Competency Program

Asbury Theological Seminary and the University of Kentucky have established a double competency program for students whose interests are social work and the ministry. Interested students should contact their major adviser.

JD/MPA Dual Degree Program

The University of Kentucky offers a 2-year, 45-hour professional Master of Public Administration degree through The Graduate School. The College of Law offers a 3-year, 87-hour Juris Doctorate. The MPA program has been professionally reviewed and recognized by the National Association of Schools of Public Affairs and Administration. The College of Law is accredited by the American Bar Association and is a member of the Association of American Law Schools. The JD/MPA dual degree is the only one of its type offered in the Commonwealth. It permits students to gain both degrees in a total time period of one year less than if the degrees were earned independently. For information contact the Program in Public Administration or the College of Law.

JD/MBA Dual Degree Program

The College of Business and Economics and the College of Law offer the opportunity to obtain the Master of Business Administration (MBA) and Juris Doctor (JD) degrees in a dual degree program. Because both schools recognize that some aspects of business and law are compatible and inter-related, students can usually obtain both degrees in four or four and one-half years instead of the five required if the degrees were pursued separately. As a result, students gain marketable skills and specialized employment opportunities in less time than might otherwise be required. Students interested in the MBA/JD program must apply to both the College of Law and The Graduate School.

Doctor of Business Administration

(See program section.)

Doctor of Musical Arts

(See program section.)

Doctor of Education

(See program section.)

Doctoral Programs With Other Universities

Joint doctoral programs in education are offered between the University of Kentucky and the other state universities: Eastern, Morehead, Murray, and Western. These programs permit qualified candidates to complete approximately one year of graduate work above the master's degree at the

cooperating university. A minimum of 18 credit hours of course work, the Qualifying Examination and the dissertation must be completed at the University of Kentucky, and a minimum of one academic year must be spent in full-time residence on the Lexington campus. The work of each candidate is directed by a joint faculty committee from both institutions.

Persons interested in these programs should confer with the Dean of The Graduate School at the cooperating university, or the Associate Dean for Graduate Studies in Education at the University of Kentucky. Applications may be filed for review by a joint screening committee. Admission will depend upon academic standing, scores on standardized examinations, and personal references.

There are available cooperative programs in musicology, in pharmacology and in civil engineering between the University of Kentucky and the University of Louisville and a cooperative program in biology between the University of Kentucky and Eastern Kentucky University. Inquiries should be directed to the Director of Graduate Studies, University of Kentucky.

GRADUATE WORK IN THE COLLEGE OF EDUCATION

The College offers the following degrees: Master of Arts in Education, Master of Science in Education, Master of Science (only in the Department of Health, Physical Education, and Recreation), Specialist in Education, Doctor of Education, and Doctor of Philosophy.

Graduate work is also provided for persons seeking Rank I or II classification.

Rank II classification may be achieved by the completion of a master's degree or the "Planned Fifth Year Program." The "Fifth Year" is a program of 32 semester hours for persons who hold bachelor's degrees and a teaching certificate. A minimum of 18 hours must be completed at the University of Kentucky. Of the 32 hours at least 12 must be in professional education, and at least 12 must be in fields outside education.

Rank I classification requires the completion of: (1) 30 hours of approved graduate level credit in addition to the requirements for a Rank II classification, or (2) 60 hours of approved graduate level credit including the master's degree.

Each student's graduate curriculum must be a well-rounded program of courses related to the student's major interest and approved by the adviser. In cases of deficient preparation the adviser, with the approval of the Director of Graduate Studies in the respective department, determines prerequisite undergraduate courses to be taken. Each department has designated one or more faculty members to direct graduate studies in that department. Specific questions regarding programs may be referred to the Directors of Graduate Studies.

The two plans which lead to the degree of Master of Arts in Education or Master of Science in Education are Plans A and B, described earlier under requirements for the M.A. and M.S. degrees.

Master of Arts in Education

The Master of Arts in Education is the program selected

by candidates seeking initial or renewal certification for work in school settings. The Master of Science in Education is the program selected by candidates seeking to pursue non-certificate areas of concentration within education and/or to prepare in fields auxiliary to education such as counseling psychology, and clinical and college teaching.

A Master of Arts in Education degree will usually lead to a Standard Certificate and Rank II for pay purposes.

The plan which leads to the degree of Master of Arts in Education is outlined below:

1. All candidates for the Master of Arts in Education degree must meet the requirements for a valid teaching certificate, based on a four-year baccalaureate program. These requirements are outlined in the general catalog of the University. If deficiencies are found, they should be overcome before proceeding with graduate work. The work required to overcome these deficiencies is in addition to the minimum graduate requirements for the degree.
2. a. A minimum of 24 semester hours of graduate work, with at least 12 semester hours in courses numbered 600 or higher, must be completed and a thesis presented, or
b. A minimum of 30 semester hours of graduate work, with at least 15 semester hours in courses numbered 600 or 700, must be completed.
3. At least 12 semester hours of graduate work must be in Education.
4. The total number of credits presented in Education, undergraduate and graduate, must be at least 30 semester hours.
5. At least 12 semester hours must be outside the College of Education for both elementary and secondary teachers except for teachers of vocational agriculture who take six hours outside Education, and Reading Specialists who take six to nine hours outside Education.

The Department of Curriculum and Instruction offers an option for secondary teachers from selected majors to meet requirements for initial teacher certification. This option may require additional courses. See the Director of Graduate Studies for more information regarding this option.

Master of Science in Education

The Master of Science in Education degree is normally awarded to students pursuing programs of study which do not lead to certification. However, if a student already holds a valid teaching certificate, the Master of Science in Education degree will give Rank II for pay purposes and may, under some circumstances, renew the certificate. The Master of Science in Education degree may also endorse a valid teaching certificate for another approved teaching subject or field.

The plan which leads to the degree of Master of Science in Education is outlined below:

1. a. A minimum of 24 semester hours of graduate work, with at least 12 semester hours in courses numbered 600 or higher, must be completed and a thesis presented, or
b. A minimum of 30 semester hours of graduate work, with at least 15 semester hours in courses numbered 600 or 700, must be completed.
2. A minimum of 12 semester hours of graduate work in the College of Education is required.

3. A minimum of six hours outside the College of Education is required, but individual programs may require additional work outside the College.

The Department of Curriculum and Instruction offers an option for secondary teachers from selected majors to meet requirements for initial teacher certification. This option may require additional courses. See the Director of Graduate Studies for more information regarding this option.

Doctor of Education

The requirements for the Ed.D. correspond to those of the Ph.D. with the following differences:

1. In addition to other credentials, admission requirements include:
 - a. a master's degree, or,
 - b. thirty (30) graduate credit hours in preparation of or applicable to an appropriate master's degree.
2. Some program areas require successful teaching, clinical, or administrative experience for admission.
3. The program requires completion of a major body of course work of at least 42 graduate credits beyond the minimum hours required for admission.
4. Course work for the Ed.D. will be planned by the Advisory Committee to complement and extend previous graduate work. Therefore, the student's total doctoral and predoctoral graduate work will reflect competencies in the following areas:
 - a. **Area of Concentration:** A significant concentration of course work designed to develop an in-depth knowledge in a specific area of Education.
 - b. **Support Areas:** Course work to support the Area of Concentration shall include the following two components:
 - (1) Disciplinary support work from outside the Area of Concentration. Some or all of this work will be done outside the College of Education.
 - (2) Course work relevant to the development of competencies in the foundational studies in Education. Such course work to be taken in departments of the College of Education other than the Area of Concentration.
 - c. **Research Methodology:** At least nine (9) credits of recent (within the 'time limit for degrees' policy of The Graduate School) course work selected to develop competencies in conceptualizing research, designing experiments, selecting appropriate methodology, processing and analyzing data, interpreting results, and arriving at conclusions.
5. Although some students' programs may require competency in a foreign language as a research tool, there is no general language requirement.
6. The core membership of the Advisory Committee for each Ed.D. student consists of members distributed as follows:
 - a. The major professor and two other members from the Area of Concentration.
 - b. Two members from areas other than the Area of Concentration; at least one of these from outside Education.
 - c. Three members must be full members of the Graduate Faculty.
7. On joint programs with the regional universities, three Advisory Committee members must be from the University of Kentucky and must be full members of the Graduate Faculty.

Doctor of Philosophy (Education)

The Doctor of Philosophy degree in the field of Education is offered in Educational and Counseling Psychology and in Studies in Higher Education—a joint program of the Departments of Higher Education and Social and Philosophical Studies in Education. (See requirements for the Ph.D.)

Specialists in Education

The degree of Specialist in Education is conferred upon a candidate who satisfactorily completes a post-master's planned program in education under the general requirements of The Graduate School and the following special requirements:

Admission

The student, prior to admission to the program must (1) have a master's degree, (2) have a standing of 3.4 or higher on all graduate work, (3) meet the requirements for a teaching certificate or have credentials appropriate to the field of specialization, and (4) have at least 30 credit hours in courses in education (undergraduate and graduate).

The student should file an application with the Director of Graduate Studies in the appropriate department and must be recommended by the major program and the department.

Program*

The student must earn a minimum of 30 credit hours of graduate work beyond the master's degree, of which at least 15 must be in courses numbered 600 or above.

A departmental committee is responsible for helping students plan individual programs. The program should contribute to specialization in a field but should not neglect the broader development of the individual.

The student must complete an independent research project (equal to three but not to exceed six credit hours) and submit a written report, a copy of which is to be filed with the department directing the research.

With the approval of the Director of Graduate Studies and the Graduate Dean, the student may transfer a maximum of nine credit hours of credit earned beyond the master's degree from an institution which is approved to offer work above the master's level.

*The Specialist in Education degree is offered in Administration and Supervision, Curriculum and Instruction, Educational Psychology and Counseling, Higher Education, Social and Philosophical Studies, Special Education, and Vocational Education.

Final Examination

The final examination required of all candidates is administered by an examining committee consisting of at least three qualified members recommended by the adviser and the Director of Graduate Studies and appointed by the Dean of The Graduate School.

Research

The University of Kentucky is the major graduate and research institution of the Commonwealth and the major landgrant university in the state. As such, it offers substantial programs in both basic and applied research. These research efforts are the life blood of graduate education pro-

grams which prepare new researchers who will continue to expand the boundaries of human knowledge and to seek answers to pressing problems of our complex society. Applied research programs in areas such as agricultural sciences, mining and minerals, engineering sciences, medicine, arts and sciences, business and economics, mathematical sciences and physics, and tobacco and health serve the Commonwealth and the nation by addressing critical issues influencing the quality of life and economic well-being of our citizenry.

University faculty and research staff have expertise in many and varied areas especially in the basic biological, physical, medical and social sciences, in engineering and in the creative arts and the humanities. These individuals conduct research which ranges from the investigation of philosophical and ethical dilemmas raised by advances in science and technology to the practical application of basic knowledge in agriculture, energy, rehabilitation, and information retrieval as well as in the economic development of the Appalachian region.

A significant aspect of research conducted at the University is the concern for its practical application for the betterment of society. Many of the techniques developed and ideas conceived in the laboratory and in advanced study evolve into technological developments of major significance.

Most research programs at the University are supported through federal, state and private sources. Application for such support and the fiscal administration of the monies received are overseen by the Office of Sponsored Projects Administration (OSPA), which operates out of The Graduate School. Programmatic organization and administration of research is provided by the various research institutes and multidisciplinary centers and, in the case of individual faculty projects, by the regular departmental, school, and college structures.

Fellowships and Assistantships

There are approximately 130 non-service fellowships available in all areas of graduate work. Over 1,000 teaching or research assistantships are available from departments and other units of the University. Ten Presidential Fellowships with a stipend of \$8,000 are awarded annually on a competitive basis to graduate students with outstanding credentials. Approximately ninety additional Academic Year Fellowships are awarded annually. During 1988-89 the stipend for a full fellowship ranges from \$6,000 (Lexington Campus graduate programs) to \$9,000 (Medical Center graduate programs). Other special opportunities are available in specific programs, for example: Public Administration, Medical Sciences, Chemistry, Patterson School of Diplomacy and International Commerce, among others. Assistantship stipends vary from \$5,500 to \$9,000. Out-of-state tuition is remitted for full fellowship or assistantship holders and proportionate amounts are remitted for smaller awards.

Fellowship and assistantship decisions are generally made by the department or program in which students enroll. Assistantships are awarded directly by the department. While fellowships are formally awarded by The Graduate School, the award is usually based upon the specific recommendation of a department.

Almost all fellowships and the greater majority of assistant-

ships are awarded for the academic year. There are virtually no fellowships and only a small number of assistantships available which begin in the spring semester. Most departments make financial aid decisions for the next academic year in the period between February and April. Students interested in fellowships or assistantships must return their application by that time. Later applicants will have a reduced chance of obtaining financial aid. All fellowships are awarded by early May. Most assistantships are also filled by that time, although students should check with the particular department of interest for exact information.

There is a common application for financial assistance. Applicants interested in either fellowships or assistantships but not both may indicate their preference on the form.

After a department makes its financial aid decisions, it will be in contact with the student. (If students are interested in a fellowship only, notification will come from The Graduate School.) Any questions about the status of applications should be addressed to the Director of Graduate Studies, department of interest.

Research and Teaching Assistantships

Most departments have support for teaching and research assistants. The stipends vary with the departments. Information concerning assistantships may be obtained from the various departments.

Miscellaneous Financial Support

Students may request funds from The Graduate School to defray partially certain expenses relating to their graduate education. These include funds for travel expenses necessary to dissertation research; certain dissertation costs, e.g., obtaining microfilm, reproducing and mailing questionnaires, etc.; for travel expenses incurred in presenting papers based on dissertation research at national meetings. Application forms are available in the Fellowship Office of The Graduate School.

Visiting Scholars and Advanced Study

When appropriate resources are available at the time desired, the President of the University, upon the recommendation of the Dean of The Graduate School and the department affected, welcomes visiting scholars as guests of the University, and grants the privilege of auditing seminars and research courses and of conducting research in laboratories and libraries. Normally there will be no charge except for laboratory expenses. Negotiations for such arrangements should be made in advance through the office of the Graduate Dean.

Postdoctoral Fellowships

Postdoctoral fellowships are available in various research departments. Information concerning the terms of the fellowships is available in the department. Postdoctoral fellows are required to register with The Graduate School through their departments.

Graduate and Professional Student Association

The Graduate and Professional Student Association

(GPSA) was formed in the spring of 1969 to provide a permanent channel for communication between the administration and the graduate and professional students.

**MULTIDISCIPLINARY CENTERS,
RESEARCH INSTITUTES AND PROGRAMS,
RESEARCH SUPPORT UNITS, AND
INTER-UNIVERSITY AFFILIATIONS.**

Graduate Program in Rehabilitation Counseling

The Graduate Program in Rehabilitation Counseling is an interdisciplinary program within The Graduate School which awards a Master of Rehabilitation Counseling degree. Program graduates are employed as counselors and administrators in public and private rehabilitation settings. Rehabilitation counselors assist clients with adjustment to disability, personal adjustment, vocational functioning, and independent living. In addition to offering academic courses, the program sponsors workshops each year that are geared to the needs of professionals and the handicapped community. Research currently underway includes methods to assess client functioning and the application of robotics to enhance client independent living and employability.

James W. Martin School of Public Administration

The Martin School offers two multidisciplinary degree programs—the Master of Public Administration and the Ph.D. in Public Administration, and engages in research and public service activities through the Institute of Government. The disciplines represented by the School's faculty are management, finance, economics, political science, and health administration. The research and public service components of the Martin School offer the School's faculty, staff, and graduate students the opportunity to engage in interdisciplinary research on public policy issues.

Graduate Center for Biomedical Engineering

The Center for Biomedical Engineering provides facilities and personnel for the support of graduate education and research concerned with the applications of engineering principles and practices to the solutions of problems in medicine and biology. The Center offers degrees in biomedical engineering at the master's and doctoral levels. The interdisciplinary research programs include the areas of signal and image processing, biofluid dynamics, pulmonary mechanics, musculoskeletal mechanics, and tissue response to stimulation. These research areas find application to problems in rehabilitation, sports medicine, industrial and highway safety, artificial organ design, tissue regeneration, wound healing and biomedical instrumentation as well as to improvements in the diagnosis and treatment of disease.

Appalachian Center

The Appalachian Center coordinates and supports research, instruction, extended service, and archival activities relating to the Appalachian region. It administers interdisciplinary research programs such as the library's Appalachian Collection. It provides assistance and a focal point for graduate students from a range of disciplines who are interested in the study of the Appalachian region.

Students interested in graduate study with an emphasis in the Appalachian region may contact the Director of the Center.

Graduate Center for Toxicology

The Graduate Center for Toxicology is dedicated to educating scientists to deal with problems relating to toxic substances and their effects on humans and our environment. The program offers broad-based training at both the master's and doctoral levels which allows students to develop expertise in any area of toxicology. In addition to the basic science curriculum, students achieve competency in sub-disciplines of toxicology through independent study, course offerings in related departments, and research conducted under the direction of the toxicology faculty.

The Sanders-Brown Center on Aging

The Sanders-Brown Center on Aging is a multidisciplinary center for gerontological teaching, research, and service, dedicated to improving the quality of life for older adults. In addition to maintaining its own research, education and service programs, the Center is responsible for coordinating and integrating aging programs throughout the University of Kentucky. It administers interdisciplinary research programs, coordinates the offering of gerontology courses, and assists in the training of graduate students. Over 150 faculty and staff from many areas and disciplines of the University are involved in programs of the Center.

Students interested in graduate study with an emphasis in gerontology may work toward the Graduate Certificate in Gerontology awarded by the Sanders-Brown Center on Aging. The certificate requires 15 graduate credit hours in an approved, multidisciplinary curriculum in gerontology and completion of graduate degree requirements in a major academic discipline. For further information on the Graduate Certificate in Gerontology contact the Certificate Director, Sanders-Brown Center on Aging.

The Tobacco and Health Research Institute

The University of Kentucky Tobacco and Health Research Institute is the administrative, research, and support center for a tobacco and health program funded by a state tax. An extensive smoking and health research effort has been organized under a program-project concept which encourages a multidisciplinary approach. The five targeted areas include cardiovascular, pulmonary, neurobehavioral, passive smoking, and plant modification. The Institute provides a number of support services for investigators involved in the program.

Kentucky Water Resources Research Institute

The Kentucky Water Resources Research Institute is supported, in part, by the U.S. Department of the Interior. Working in close cooperation with state, regional and federal water resources organizations, the Institute defines current and emerging water resources research needs for Kentucky. The Institute provides this information to college and university faculty to obtain research proposals that will be directed to resolving the state's water resource problems. These proposals are reviewed, and the best are selected for funding by the Institute. The Institute also disseminates research results and conducts a variety of water-related technology transfer programs.

The Institute for Mining and Minerals Research

The Institute for Mining and Minerals Research conducts research on mining and mineral processing, reclamation, mineral characterization, mine utilization, environment and health, and socio-economic and legal research. The Institute also provides continuing education through short courses, conferences and seminars for members of the academic community, industry, and the general public.

The Patterson School of Diplomacy And International Commerce

The Patterson School of Diplomacy and International Commerce offers an interdisciplinary master's degree which can be tailored to meet the career needs of individual students. The program is especially useful for students desiring careers in any of the non-academic fields in foreign affairs such as international banking, business and journalism, or service with governmental agencies or international organizations in foreign affairs. To assure the interdisciplinary character of the degree, students may concentrate their work in a specific geographical area or focus on certain aspects of international affairs.

In addition, the Patterson School serves in an advisory capacity to Ph.D. programs in departments offering internationally oriented doctoral degrees in various colleges on campus.

Lucille Parker Markey Cancer Center

The Markey Cancer Center is an NCI-designated multidisciplinary center for research, patient care, education and community outreach.

Research activities are broadly represented through four program areas: tumor immunology, molecular genetics, membrane studies and developmental therapeutics. The Center supports core research facilities for flow cytometry, macro-molecular structure, electron microscopy, nuclear magnetic resonance spectro and hybridoma production. For the most part, these activities are supported by research grants from the National Cancer Institute, the American Cancer Society, and other funding agencies. The Center also has available some additional resources which are awarded through peer-reviewed grants in all areas relevant to cancer problems.

Center of Membrane Sciences

The Center of Membrane Sciences affords a unique approach to promote multidisciplinary research and education in both natural biological membranes and artificial synthetic membranes. UK faculty from the Departments of Chemistry, Chemical Engineering, Biochemistry, Pharmacy, Pharmacology, Medical Microbiology and Immunology, Physiology and Biophysics, Nutrition and Food Sciences, and Psychology are active in the programs of the Center. This collaboration between experts in biological membranes with experts in synthetic membranes constitutes the major strength of the Center and it puts the University and the Commonwealth at the forefront of this vital area of science and technology. No other such Center of Membrane Sciences exist in the United States. The science of membranes encompasses broad areas: (a) the structure and chemistry of biological membranes and their constituents, transport

processes, and information transfer (transmembrane signaling) in living systems; (b) the synthesis, structure, and chemistry of synthetic membranes; separation of solutes ranging in size from smaller molecules and ions to large proteins by reverse osmosis and ultrafiltration with biotechnology and pharmaceutical applications; separation of gaseous mixtures by synthetic membranes; (c) separation of organic and biomolecules by synthetic membranes containing chemical and bifunctional groups. Opportunities are available for graduate students in each of the above-listed disciplines as well as in agriculture, allied health, medicine, dentistry, and other areas.

Graduate Center in Computational Sciences

The Graduate Center in Computational Sciences is a center for research and education with primary emphasis on developing and using computer models to analyze chemical, physical, and biological systems. Faculty from Mathematics, Computer Science, Statistics, Engineering, Chemistry, Physics, Biology, and other departments use a multidisciplinary team approach to study such systems, utilizing the full range of computational resources—micro, mini, mainframe, and supercomputers. This includes algorithm development and evaluation for vector, parallel, and array processing as well as for scalar machines. Courses in applied mathematics, numerical analysis, and computer modeling are available for students interested in this approach to analyzing and understanding these systems.

Maxwell H. Gluck Equine Research Center

The Gluck Equine Research Center is part of the Department of Veterinary Science. Research in the Center is supported, in part, by an endowment of the Kentucky Equine Research Foundation. The Center provides state-of-the-art facilities and equipment for the study of a wide variety of diseases of the horse. Research in the areas of infectious disease, reproductive physiology, parasitology, pharmacology, immunogenetics, growth and development, lameness, pathology, blood typing, and forensic pharmacology are conducted within the 65,565 square foot building located in front of Commonwealth Stadium.

The Gluck Center offers postgraduate and postdoctoral training in a variety of disciplines. The Center is well-positioned in one of the most concentrated horse breeding areas in the world. Both basic biomedical and problem-oriented research are included in the Center's program.

Center for Business and Economic Research

The Center for Business and Economic Research provides a focal point for research in the College of Business and Economics. It provides information and staff support for research projects, assists faculty in efforts to secure external funding for research, and coordinates multidisciplinary team approaches to research. The Center also monitors and analyzes the economy of Kentucky and provides professional staff support for the Governor's Financial Policy Council.

Center for Pharmaceutical Science and Technology

The Center for Pharmaceutical Science and Technology (CPST) offers an institutional framework for multidisciplinary research in the pharmaceutical sciences principally through collaboration with the industry. By providing a focus for efforts already underway at the University, the

Center assists established and emerging pharmaceutical, chemical and biotechnology firms engaged in the development, production and marketing of drug products for human and animal health care. The Center's mission is to enrich academic programs, promote technology transfer, conduct specialized educational and training programs relating to pharmaceutical technologies and enhance economic development in the Commonwealth.

Kentucky Transportation Center

The Kentucky Transportation Center serves as the focal point in the state for interdisciplinary research in transportation. In addition to its extensive Transportation Research Program the Center operates a Technology Transfer Program and provides technical assistance and training to road and street departments throughout the Commonwealth. The Center works closely with various state agencies and conducts research supported by a wide variety of sources.

The Center for Developmental Change

The Center for Developmental Change is concerned with the promotion, initiation, and coordination of multidisciplinary research on various aspects of social change. Its staff is available to aid University researchers in formulating projects, organizing multidisciplinary teams, developing research designs, preparing research proposals, locating financial support, conducting research operations, and writing up the research results in the form of reports or other publications. The Center is particularly interested in developing projects that explore the social and behavioral aspects of population change, aging and technological and environmental change both in the United States and abroad.

The Interdisciplinary Human Development Institute

The Human Development Institute is an interdisciplinary research, training, and service program related to developmentally disabled or handicapped individuals. Interdisciplinary involvement includes education, psychology, medicine, social services, rehabilitation, and allied health professions. Program relationships also exist with many local, state and national agencies, and with industry.

Kentucky Geological Survey

The Kentucky Geological Survey performs basic research on various aspects of Kentucky's geology and mineral resources, including coal, industrial and metallic minerals, oil, gas, and water resources. Cooperative projects with the U. S. Geological Survey have made Kentucky the best mapped state in the nation. Maps and reports, oil and gas well records, drill cuttings from wells, and core samples are maintained by KGS and made available for use by other researchers and the public.

NASA/UK Technology Applications Program

NASA/UK TAP is a public service program of the James W. Martin School of Public Administration. It is a part of a nationwide network of technology transfer centers under NASA's Technology Utilization Division.

The purpose of the program is to enhance economic development and service delivery in Kentucky by providing problem-solving information and assistance to local and state government agencies, businesses, academic institutions and

not-for-profit organizations. Through its capability to access more than 1,500 databases and in its role as the principal local gateway to more than 500 Federal research and development laboratories, NASA/UK TAP retrieves information for practical solutions to user's technical and economic questions. NASA/UK TAP's resources provide the most comprehensive and diversified information source for applied problem-solving available within the Commonwealth.

Center for Robotics and Manufacturing Systems

The Center conducts research related to manufacturing and automation. Focus areas include small batch machining, rapid prototyping of plastic parts, high productivity assembly, second level electronic packaging, factory information systems for computer integrated manufacturing, and robotics in agriculture, medicine, and mining. Typical projects pursue defined goals with a high degree of relevance to manufacturing industries, have both agency and industrial support, utilize multiple technologies, involve a multidisciplinary team, and extend over several years. A unique aspect of the Center is its Industrial Extension and Continuing Education function, which provides manufacturing assistance to Kentucky industry, establishes information exchange and transfer technology researchers and industry, and provides short courses, conferences, symposia, and on-site training. The Center will be housed in a 60,000 square foot building scheduled for completion in 1989 and located adjacent to the College of Engineering. Qualified visitors from academic or industrial backgrounds are encouraged to make use of the Center's extensive manufacturing equipment and computer facilities and will be provided office space and support. Temporary assignments of personnel to or from the Center are also encouraged.

Program for Cultural Resource Assessment

The Program for Cultural Resource Assessment is the primary programmatic research unit within the Kentucky Anthropological Research Facility. The Program fosters, develops and administers archaeological research and public service activities. It provides formal field and laboratory training opportunities for students and others interested in the investigation, assessment and evaluation of prehistoric and historic cultural, archaeological and architectural resources. The Program carries out a wide variety of research projects funded through both governmental and private agencies.

The Survey Research Center

The Survey Research Center designs, coordinates, and conducts survey research activities for the University and public agencies and assists faculty and students with survey research projects. The Center's services range from research design and questionnaire development through data analysis and report writing.

The Center conducts national, statewide, and local telephone and mail surveys, and face-to-face interviews. It conducts the Kentucky Survey, a biannual statewide telephone survey which probes the opinions and attitudes of Kentuckians. Data from the Kentucky Survey and many other Center projects are available for faculty and graduate student research.

The Computing Center

The Computing Center offers University-wide computing services and support for all UK faculty, students, and staff. Present facilities include: an IBM 3090-300E with three attached vectors which provides supercomputer services to support large scale, numeric intensive computational needs; an IBM 3081/K32 which provides general purpose academic and administrative computing services; a PRIME minicomputer complex, consisting of two PRIME 850/8 and 1 PRIME 9555/12, which are used for general purpose instructional and academic computing needs; and an extensive array of microcomputers and terminal clusters which are located in various buildings. A wide array of application software is available to support specialized instructional and research interests. General and specialized computing consulting services are also available through the Center. In addition periodic short courses and workshops are offered which focus on specific applications. More information is available through brochures which outline specific facilities and services through an electronic newsletter. Contact the Consulting Room in the Computing Center for more assistance and to obtain information for establishing an account to use the facilities.

The Mathematical Sciences Consulting Laboratory

The Mathematical Sciences Consulting Laboratory is operated by the Department of Statistics. It provides advice to faculty and graduate students on proper study designs for projects involving quantitative data as well as on appropriate strategies for analyzing the data emanating from such projects. Laboratory services cover the entire range of applied statistical methodology including biostatistics, epidemiology and survey sampling. Statistical programming support for projects is also available on a fee for services rendered basis. The staff occasionally offers short courses on specialized topics.

Materials Characterization Facility

The Materials Characterization Facility provides a variety of modern analytical techniques to faculty, staff and students who are engaged in materials science and engineering research. Facilities that are currently available include instrumentation for structural analysis, surface analysis, and electron, ion, atomic and molecular spectroscopic analysis. Arrangements can also be made through the Facility for materials analysis by Extended X-Ray Absorption Fine Structure (EXAFS) and other specialized x-ray techniques that require synchrotron radiation. Specific techniques include electron microscopy, both SEM and TEM/STEM, x-ray diffraction, x-ray photoelectron spectroscopy, Auger electron analysis, secondary ion mass spectroscopy, ion scattering spectroscopy, Mossbauer spectroscopy, laser Raman and infrared spectroscopy, and microwave absorption spectroscopy.

Flow Analysis and Cell Sorting Facility

The Flow Analysis and Cell Sorting lab was established to provide the University research community with a state of the art facility for analysis and sorting of single cell populations for research and as an aid to clinical diagnosis. The Facility currently houses a Becton-Dickinson, dual (dye) laser FACStar Plus Cell Sorter, a single laser FACStar Cell

Sorter, and FASCcan analyzer with both a Consort 30 computer system and a Micro VAX II computer system with software programs for immunofluorescence cluster analysis, cell-cycle analysis and kinetics programs. The Facility has a technical director and currently has a support staff of two full-time technical people. The Facility is currently used for: 1. Analysis of single cell suspensions based on the parameters of cell volume, light scatter and fluorescence. 2) Analysis of cellular DNA content and cell cycle analysis. 3) Analysis of cell surface (antigen) changes using single, two or three color immunofluorescence. 4) Detection of small populations of cells using monoclonal antibodies and immunofluorescence. 5) High resolution analysis of chromosomes. 6) Analysis of Ca^{++} flux in single cells over time and 7) Fluorescence activated cell sorting (cell separation) on the basis of fluorescence intensity or light scatter.

The Nuclear Magnetic Resonance Spectroscopy Center

The NMR Spectroscopy Center operates 500 MHz, 400 MHz, 300 MHz, and 200 MHz spectrometers located in the Chemistry Department, the College of Pharmacy, and the Combs Research Building of the Markey Cancer Center. The Center also provides networked off-line spectral processing services on SUN and microVAX computers at various locations. This equipment can perform any high resolution NMR experiment required by investigators in any segment of the University. The Center staff collaborates in the design, performance and interpretation of experiments, provides practical operator training as well as theoretical course work, maintains the instruments and, when required, performs experiments for individual investigators. The Center maintains close collaborative ties with the MRISC.

The Magnetic Resonance Imaging & Spectroscopy Center

The MRISC, located in the College of Medicine, is an interdisciplinary center of excellence promoting both basic and applied research and superior patient care with magnetic resonance imaging and spectroscopy. The Center presently operates a 300 MHz widebore multinuclear NMR spectrometer and a 4.7T 33 cm horizontal bore multinuclear imager/ *in vivo* spectrometer. It will shortly install a 2.0T multinuclear human research imager/spectrometer. The Center maintains electronics and mechanical shops, animal holding and preparation facilities and computer equipment necessary for the performance of its mission. The Center staff carry on basic research in the application of both imaging and *in vivo* spectroscopy. The staff collaborate with investigators in many units of the University in designing, conducting, and interpreting a variety of experiments addressing fundamental biomedical questions. The MRISC interacts extensively with the NMR Spectroscopy Center to provide outstanding NMR spectroscopic capabilities to the biomedical community.

Biomedical Image Processing Distributed Shared-Use Facility

This Shared-Use Facility offers a multidisciplinary talent base of users of common systems for research and education in biomedical image processing. The Facility is distributed over six sites on campus; Department of Anatomy and Neurobiology, Division of Cardiology, Center for Biomedical Engineering, Department of Medical Microbiology and Immunology, Sanders-Brown Center on

Aging and the Magnetic Resonance and Spectroscopy Center. The Center for Biomedical Engineering serves as the primary Development, Education and Training (DET) site for the Facility. Facility capabilities include: real-time acquisition and analysis of video image sequences (including those from fluorescent microscopy); a large menu of black/white and color image processing software for filtering, densitometry, cell counting, particle size analysis, morphometry, etc.; three-dimensional reconstruction from two-dimensional serial sections for anatomical road mapping, computer-aided design of custom implants and mapping of biochemical information on anatomical images; and three-dimensional motion analysis, involving the tracking of identifiable targets on humans and machines and in flow systems to determine spatial relationships, velocities and accelerations of segments, components and/or particles. Arrangements can be made through the DET site concerning the availability of Facility resources.

Electron Microscopy Consortium

This campuswide Consortium provides researchers with sophisticated capabilities in electron optics imaging and analytical microscopy. Specific instrumentation includes high resolution transmission (T.E.M.), scanning-transmission (S.T.E.M.), and scanning (S.E.M.) microscopes as well as high brightness guns and x-ray analysis equipment. Nine new electron microscopes were added to the Consortium's instrumentation base during 1988. The advanced technology represented in the Consortium provides the nucleus around which introductory and advanced training in ultrastructure studies are developed and provides the foundation of the University's ability to support cutting-edge biomedical and materials research in a wide variety of fields and disciplines.

The Macromolecular Structure Analysis Facility (MSAF)

MSAF is a central facility, housed in the D. E. Combs Laboratory Research Building of the Cancer Center, which provides state-of-the-art DNA and protein synthesis and sequencing services to biological researchers at the University of Kentucky. The services available on a fee-for-use basis include: 1) High sensitivity amino acid analysis on a Beckman Model 6300 Amino Acid Analyzer; 2) Protein sequence analysis at picomole sensitivity with two fully automated Applied Biosystems Pulsed-liquid Phase Sequencers; 3) Automated, non-radioactive DNA sequence analysis with an Applied Biosystems DNA Sequencer; 4) Oligonucleotide (up to 100 nucleotides) synthesis with an Applied Biosystems DNA Synthesizer; and 5) Peptide Synthesis with a Biosearch Peptide Synthesizer. Access is available to protein and DNA sequence data banks as well as for structure prediction programs through computers serving the facility. Trained technicians and staff are available to provide these services and to advise researchers in methods for preparing materials for use and analysis.

Southeastern Universities Research Association

The Southeastern Universities Research Association (SURA) is a consortium of thirty-five universities in the Southeast formed for the purpose of managing large cooperative projects in science, engineering and medicine. The

University of Kentucky is a founding member of SURA.

One of SURA's major projects is the construction and operation of a Continuous Electron Beam Accelerator Facility (CEBAF) for research in nuclear science. It will be available for use by faculty and graduate students of all participating institutions. Another major project of SURA is SURANET, the first regional supercomputer network in the country and the first component regional network of NSFnet, a national scientific network being established by the National Science Foundation. Faculty and graduate students at the University of Kentucky have full access to all SURANET services and capacities.

Other SURA projects include the development of joint efforts in material science, astronomy, and other forms of computing.

Consortium for Fossil Fuel Liquefaction Science

The Consortium for Fossil Fuel Liquefaction Science provides a framework for coordinating faculty and student research on the development of coal liquefaction as an energy resource alternative. Organized in 1984, the Consortium seeks to identify and evaluate new methods of coal liquefaction; to develop high-tech methods of characterizing coal for liquefaction potential; and to systematically assess the potential of liquefaction concepts as future technology options. The Consortium is based at the University of Kentucky's Institute for Mining and Minerals Research and consists of the University of Kentucky, University of Pittsburgh, Auburn University, University of Utah, West Virginia University, and the Kentucky Energy Cabinet. It is supported by the universities, the U.S. and state governments, and private industry.

Research Program at Oak Ridge Associated Universities

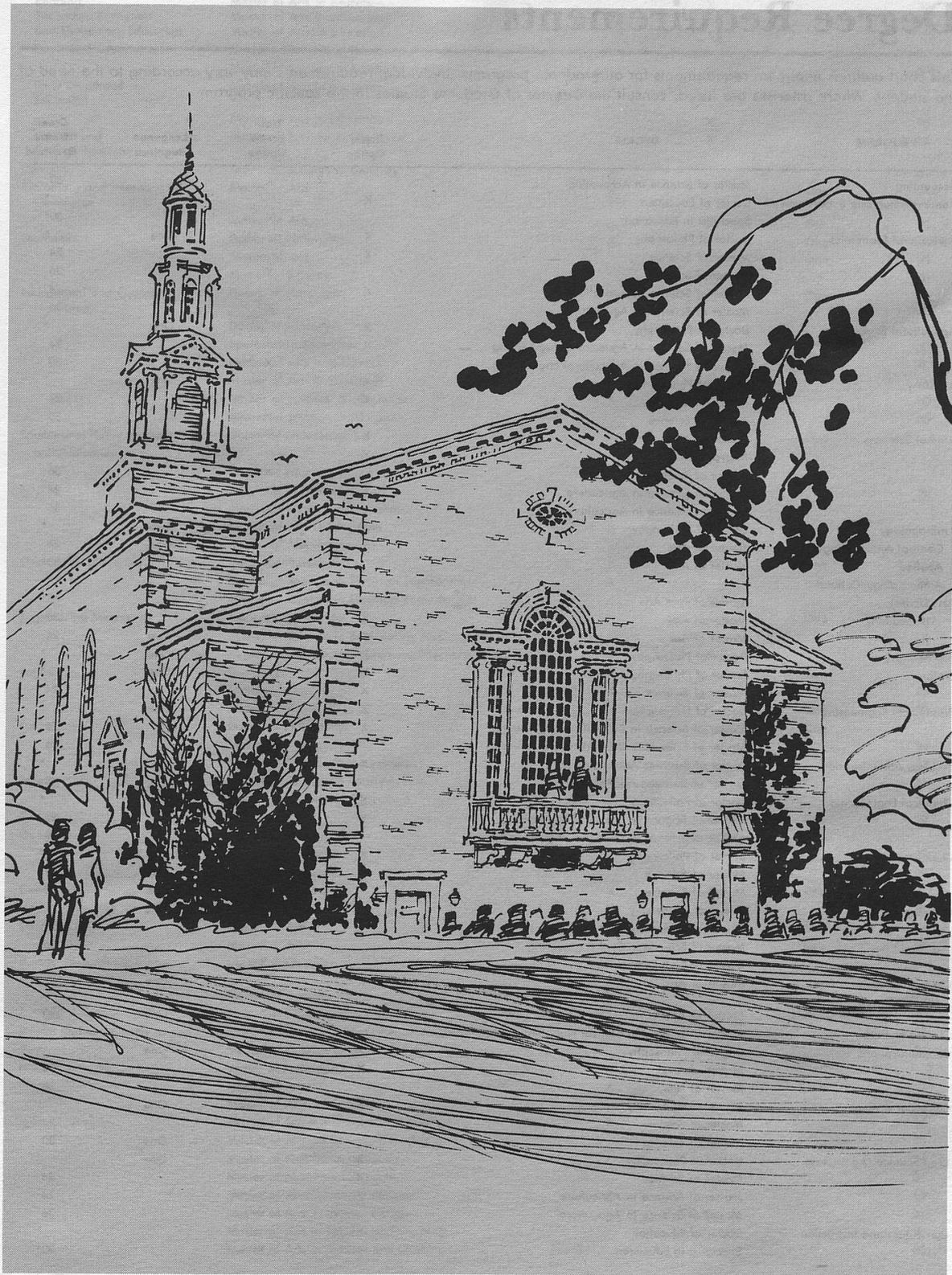
The University is one of the sponsoring institutions of the Oak Ridge Associated Universities (ORAU) located at Oak Ridge, Tennessee. Through this association, the University of Kentucky has available to it the facilities of the National Laboratories in Oak Ridge and of the research staffs of these laboratories. When master's and doctoral candidates have completed their course work, it is possible by special arrangement for them to go to Oak Ridge to work on their research problems and prepare their theses. In addition, it is possible for staff members of the University to go to Oak Ridge for varying periods, usually not less than three months, for advanced study in their particular fields.

Among ORAU's activities are competitive programs to bring undergraduates, graduate students, and faculty members to work on research problems at the many facilities of the Department of Energy. Participants are selected by ORAU and the staffs of the facilities participating in the ORAU programs.

Students on graduate fellowships receive stipends which vary according to the number of their dependents and the level of work they are doing. Staff members may work at the participating facilities and receive stipends commensurate with their present salary and rank.

GRADUATE COUNCIL

<p>Dr. Ronald Atwood.....(1989) Curriculum and Instruction</p> <p>Dr. Lisa Barclay.....(1989) Family Studies</p> <p>Dr. Vansant Bhapkar.....(1989) Statistics</p> <p>Dr. Douglas Dahlman.....(1991) Entomology</p> <p>Prof. Marilyn Hamann.....(1991) Art</p> <p>Dr. Robert Lester.....(1990) Biochemistry</p> <p>Dr. George Mitchell.....(1989) Animal Sciences</p> <p>Dr. Arthur J. Nonneman.....(1990) Psychology</p> <p>Dr. Clayton Omvig.....(1990) Vocational Education</p>	<p>Dr. Gerald I. Roth.....(1990) Oral Biology</p> <p>Dr. Andrew Seybert.....(1991) Mechanical Engineering</p> <p>Dr. William Stober.....(1991) Economics</p> <p>Dr. Kumble Subbaswamy.....(1991) Physics and Astronomy</p> <p>Dr. Mary Vore.....(1990) Pharmacology</p> <p>Appointed Members</p> <p>Dr. Kathleen Dewalt.....(1989) Behavioral Science</p> <p>Dr. Daniel B. Smith.....(1989) History</p>
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Degree Requirements

This chart outlines minimum requirements for all graduate programs. Individual requirements may vary according to the need of the student. Where asterisks are listed, consult the Director of Graduate Studies in the specific program.

PROGRAM	DEGREE	Thesis Option	Non-thesis Option	Language Required	Credit Hours Required
Accounting	Master of Science in Accounting		X		30
Administration and Supervision	Doctor of Education	X			*
	Specialist in Education		X		30*
Agricultural Economics	Doctor of Philosophy	X		One	*
	Master of Science	X			24
	Master of Science		X		36
	Master of Science in Agriculture	X			24
	Master of Science in Agriculture		X		36
Agricultural Engineering	Doctor of Philosophy	X		One	*
	Master of Science in Agricultural Engineering	X			24
	Master of Science in Agricultural Engineering		X		30
Anatomy	Doctor of Philosophy	X		One	*
	Master of Science	X			24
	Master of Science		X		30
Animal Sciences	Doctor of Philosophy	X		One	*
	Master of Science	X			24
	Master of Science		X		36
	Master of Science in Agriculture	X			24
	Master of Science in Agriculture		X		36
Anthropology	Doctor of Philosophy	X		Two	*
General Anthropology	Master of Arts	X		One	24
Applied	Master of Arts		X		33*
Anthropology/Cultural					
Art (Studio)	Master of Fine Arts		X		60*
(Education)	Master of Arts	X	X		36
(History)	Master of Arts	X		Two	24
Biochemistry	Doctor of Philosophy	X		One	*
Biology	Doctor of Philosophy	X		One	*
	Master of Science	X			24
Biomedical Engineering	Doctor of Philosophy	X		One	*
	Master of Science in Biomedical Engineering	X			26
	Master of Science in Biomedical Engineering		X		26
Business Administration	Doctor of Business Administration	X			*
	Master of Business Administration		X		48
Chemical Engineering	Doctor of Philosophy	X		One	*
	Master of Science in Chemical Engineering	X			24
	Master of Science in Chemical Engineering		X		30
Chemistry	Doctor of Philosophy	X		One	*
	Master of Science	X		One	24
	Master of Science		X	One	30
Civil Engineering	Doctor of Philosophy	X		One	*
I	Master of Science in Civil Engineering	X			24
II	Master of Science in Civil Engineering		X		36
	Master of Civil Engineering		X		30*
Classical Languages and Literature	Master of Arts	X		One	24
	Master of Arts		X	One	30
Clinical Nutrition	Master of Science in Clinical Nutrition		X		30
Communications	Doctor of Philosophy	X		One	*
	Master of Arts	X			24
	Master of Arts		X		30*
Computer Science	Doctor of Philosophy	X		One	*
	Master of Science	X			24
	Master of Science		X	One	30
Crop Science (Agronomy)	Doctor of Philosophy	X		One	*
	Master of Science	X			24
	Master of Science in Agriculture	X			24
	Master of Science in Agriculture		X		36
Curriculum and Instruction	Doctor of Education	X			*
	Specialist in Education		X		30*

Reading, Secondary Education and Elementary Education	Master of Arts in Education		X		30
	Master of Arts in Education	X			24
	Master of Arts in Education		X		30
Secondary Education	Master of Science in Education	X			24*
	Master of Science in Education		X		30*
Early Childhood Education	Master of Arts in Education	X			30
	Master of Arts in Education			X	36
Clinical and College Teaching	Master of Science in Education			X	36
	Master of Science in Education			X	36
Dentistry	Master of Science in Dentistry	X			30
Diplomacy and International Commerce	Master of Arts	X		One	24
	Master of Arts			X	One
Economics	Doctor of Philosophy	X			One
	Master of Arts			X	One
	Master of Science			X	30
Educational and Counseling Psychology	Doctor of Philosophy	X		One	*
	Doctor of Education	X			*
Educational Policy Studies and Evaluation	Specialist in Education			X	30*
	Master of Arts in Education	X			30*
	Master of Arts in Education			X	36*
	Master of Science in Education	X			30*
	Master of Science in Education			X	36*
	Doctor of Philosophy	X		One	*
	Doctor of Education	X			*
Electrical Engineering	Specialist in Education			X	30*
	Master of Science in Education			X	*
	Master of Arts in Education	X			*
	Master of Arts in Education			X	*
	Doctor of Philosophy	X			One
Engineering Mechanics	Master of Science in Electrical Engineering	X			24
	Master of Science in Electrical Engineering			X	30
	Doctor of Philosophy	X		One	*
English	Master of Science in Engineering Mechanics	X			24
	Master of Science in Engineering Mechanics			X	30
	Doctor of Philosophy	X		Two	*
Entomology	Master of Arts	X		One	24
	Master of Arts			X	One
	Doctor of Philosophy	X		One	*
Forestry	Master of Science	X			24
	Master of Science in Agriculture	X			24
	Master of Science in Forestry	X			24
French	Master of Science in Agriculture	X			24
	Master of Arts			X	One
	Master of Arts	X		One	*
Geography	Doctor of Philosophy	X		One	*
	Master of Arts	X			24
	Master of Arts			X	30
Geology	Doctor of Philosophy	X		One	*
	Master of Science	X			24
German	Master of Arts	X		One	24
	Master of Arts			X	One
	Doctor of Education	X			*
Health, Physical Education and Recreation	Master of Science	X			24
	Master of Science			X	30
	Master of Science in Radiological Medical Physics			X	30
Health Radiation Sciences	Master of Science in Health Physics			X	32
	Doctor of Philosophy	X		One*	*
	Master of Arts	X		One*	24
History	Master of Arts			X	36
	Master of Science in Family Studies	X			30
	Master of Science in Family Studies			X	36
Home Economics	Master of Nutritional Sciences	X			24
	Master of Nutritional Sciences			X	36
	Master of Arts in Interior Design	X			24
	Master of Arts in Interior Design			X	36
	Master of Arts in Textiles and Clothing	X			24
	Master of Arts in Textiles and Clothing			X	36
	Master of Arts in Textiles and Clothing			X	36

Horticulture and Landscape Architecture	Master of Science in Agriculture	X		24
Library Science	Master of Science in Agriculture		X	36
	Master of Arts	X		30
	Master of Arts		X	30
Mathematics	Master of Science in Library Science		X	36
	Doctor of Philosophy	X		36*
	Master of Science		X	36
	Master of Arts	X		30
Mechanical Engineering	Master of Arts		X	30
	Master of Arts in Teaching (Mathematics)	X	X	30*
	Doctor of Philosophy	X		30*
	Master of Science in Mechanical Engineering	X		24
Metallurgical Engineering and Materials Science	Master of Science in Mechanical Engineering		X	36*
	Doctor of Philosophy	X		36*
	Master of Science in Materials Science and Engineering	X		24
	Master of Science in Materials Science and Engineering		X	30
Microbiology	Doctor of Philosophy	X		30
	Master of Science	X		24
	Master of Science		X	30
Mining Engineering	Doctor of Philosophy	X		30*
	Master of Science in Mining Engineering	X		24
	Master of Science in Mining Engineering		X	30
School of Music	Doctor of Philosophy	X		30*
	Doctor of Musical Arts	X		30*
	Master of Music	X		24
	Master of Music		X	30
	Master of Arts	X		24
Nursing	Doctor of Philosophy	X		30*
	Master of Science in Nursing	X		34
	Master of Science in Nursing		X	34
Operations Research	Master of Science in Operations Research		X	36
Pharmaceutical Sciences	Doctor of Philosophy	X		36*
	Master of Science	X		24
	Master of Science		X	30
Pharmacology	Doctor of Philosophy	X		30*
	Master of Science	X		24
	Master of Science		X	30
Philosophy	Doctor of Philosophy	X		30*
	Master of Arts		X	30
	Master of Arts	X		30
Physics and Astronomy	Doctor of Philosophy	X		30*
	Master of Science	X		24
	Master of Science		X	30
Physiology and Biophysics	Doctor of Philosophy	X		30*
	Master of Science	X		24
	Master of Science		X	30
Plant Pathology	Doctor of Philosophy	X		30*
	Master of Science	X		24
	Master of Science in Agriculture	X		24
Plant Physiology	Master of Science in Agriculture		X	36
	Doctor of Philosophy	X		36*
	Master of Science	X		24
Political Science	Doctor of Philosophy	X		24*
	Master of Arts	X		24
	Master of Arts		X	30
Psychology	Doctor of Philosophy	X		30*
	Master of Arts	X		24
	Master of Science	X		24
Public Administration	Doctor of Philosophy	X		42
	Master of Public Administration		X	45
Rehabilitation Counseling	Master of Rehabilitation Counseling		X	36*
Social Work	Master of Social Work		X	36*
Sociology	Doctor of Philosophy	X		54
	Master of Arts	X		30*
	Master of Arts	X		24
	Master of Science in Agriculture	X		30
	Master of Science in Agriculture		X	24
	Master of Science in Agriculture		X	36

Soil Science (Agronomy)	Doctor of Philosophy	X		One	*
	Master of Science	X			24
	Master of Science in Agriculture	X			24
	Master of Science in Agriculture		X		36
Spanish and Italian Languages and Literatures	Doctor of Philosophy	X		Two	*
	Master of Arts	X		One	24
Special Education	Master of Arts		X	One	30
	Doctor of Education	X			*
	Specialist in Education		X		30*
	Master of Arts in Education	X			24*
	Master of Science in Education	X	X		30*
	Master of Science in Education	X	X		30*
Statistics	Doctor of Philosophy	X		One	*
	Master of Science	X			29
	Master of Science		X		35
Theatre Arts	Master of Arts		X		30
Toxicology	Doctor of Philosophy	X		One	*
	Master of Science	X			24
	Master of Science		X		31
Veterinary Science	Doctor of Philosophy	X		One	*
	Master of Science	X			24
Vocational Education	Doctor of Education	X			42*
	Specialist in Education		X		30*
	Master of Arts in Education	X			24
Business Education, Distributive Education	Master of Arts in Education		X		30
Vocational Education, Agricultural Education, Home Economics Education, Industrial Education	Master of Science in Education	X	X		24
	Master of Science in Education		X		30

Programs and Directors of Graduate Studies

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Dean—C. Oran Little
Associate Dean for Research and Graduate Studies—Glenn Collins

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Associate Dean for Research and Graduate Studies—Merlin Hackbart

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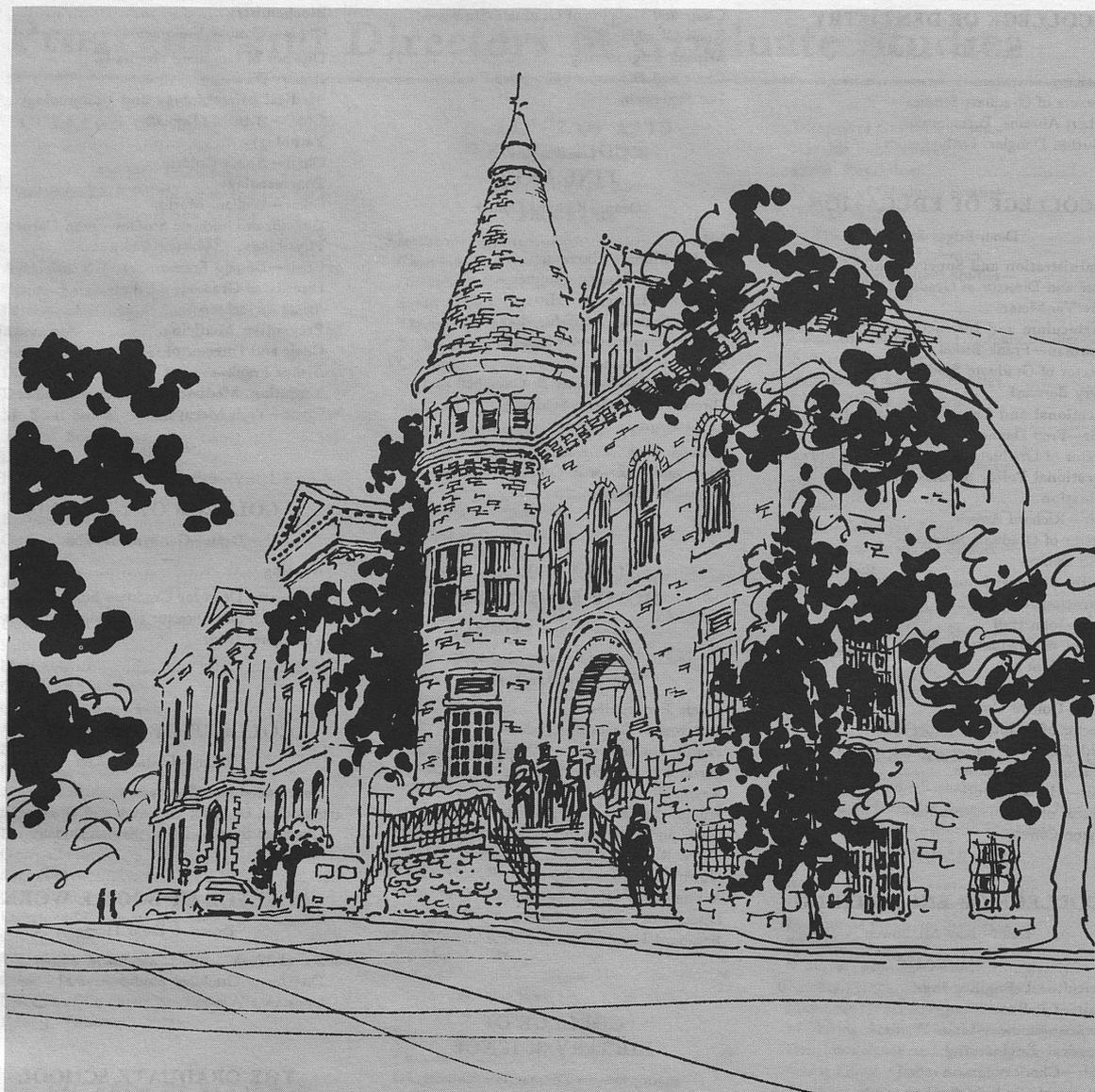
COLLEGE OF SOCIAL WORK

Dean—S.Zafar Hasan

Social Work.....	85
Director of Graduate Studies— Constance Wilson	

THE GRADUATE SCHOOL

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**The Graduate School
Staff Directory**

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Pegge Woolums (P-Z)	(606) 257-4619	of Kentucky Graduate Center, Highland	
International Admissions		Heights, KY	
Sue Slone (A-K)	(606) 257-4615	Peg Griffin	(606) 572-6370

The Graduate School Programs

The course listings in The Graduate School Bulletin include all courses approved through June 15, 1988.

GS 600 Special Topical Graduate Course. (1-3) An interdisciplinary, topical or experimental course to be approved by the dean of The Graduate School. A particular course can be offered no more than twice under the number, GS 600. May be repeated to a maximum of six credits. Prereq: Consent of the instructor.

School of Accountancy

Graduate Faculty: Professors William W. Ecton, James A. Knoblett, Donald L. Madden, Michael Tearney, Manuel A. Tippos, and Reimond P. VanDaniker. Associate Professors Myrtle W. Clark, Daniel L. Fulks, Stuart Keller and Thomas Pope.

Associate Members: Associate Professor James R. Holmes. Assistant Professor Charles Bokemeier.

Emeritus Professor: Robert Haun.

Master of Science in Accountancy

Plan A:

The Master of Science in Plan A is primarily for students who wish to have a program of advanced study in accounting. This program provides adequate preparation for employment in public accounting, business, government and other organizations, or for initial employment as an instructor at the college level. The program can be structured to prepare a student for further graduate work in related fields. Specifically, the program's objectives are to:

1. Develop the ability to carry out significant research and communicate results thereof.
2. Provide for greater concentration in a selected area of accounting.
3. Expand the student's knowledge of accounting theory, the significance of professional literature, and controversial concepts at an advanced level.
4. Further the student's understanding of the close relationship between accounting and other fields of business and between accounting and disciplines outside the business area.
5. Provide the opportunity to study in an area (or areas) outside the business fields, when such study is consistent with the student's educational needs and objectives.

Requirements

1. Graduate study in accounting presumes a minimum preparation of 30 hours in business and economics, including the completion of the following basic courses (examples of acceptable courses at the University of Kentucky are given in parentheses):

Principles of Economics (ECO 201,

ECO 202)
Principles of Accounting (ACC 201, ACC 202)
Statistical Method (STA 291, ECO 391)
Management (MGT 301)
Finance (FIN 300)
Marketing (MKT 300)
Strategic Management (MGT 499)
Business Law (MGT 340)

Prerequisites to graduate study in accounting include courses in intermediate accounting, managerial accounting, tax accounting, auditing, and systems.

2. The Graduate Management Admission Test (GMAT) must be taken prior to being admitted.

3. A minimum of 30 semester hours must be presented in courses carrying graduate credit. At least 20 semester hours must be in courses reserved exclusively for graduate students and at least 15 of these must be in accounting.

4. The course requirements are:

- a. One course in each of the following fields:
Advanced Managerial Accounting
Income Taxation
Accounting Theory
Attest Function
One additional accounting course at the 600 level.
- b. At least six semester hours of graduate credit outside the Department of Accounting, three of which must be production related.
- c. A course in Computer Science or Data Processing.
- d. The candidate must submit evidence of competence in statistics at the graduate level.

5. Minimal average of grade B in all courses attempted for graduate credit after being admitted to The Graduate School. A minimal average of grade B must similarly be achieved for all accounting courses attempted after being admitted to The Graduate School. Students obtaining two grades of C below a B average will be dropped by the department.

6. Successful completion of a comprehensive examination.

Note: Student's interested in the five-year degree program in Accounting should consult the Director of Graduate Studies for specific information.

Master of Science in Accountancy— Five Year Program

Plan B:

This program was developed in response to the belief that the traditional baccalaureate program no longer provided the level of training and proficiency required for entry into the profession. As the admissions and retention standards indicate, students must apply for admission during the second semester, junior year and to The Graduate School prior to the beginning of the second semester, senior year, and complete the 150 semester-hour requirement. Because the program is highly structured, interested students are encouraged to familiarize themselves with its requirements as early as their sophomore year so that they may plan their course work accordingly.

The program facilitates specialization in the areas of auditing, taxation, not-for-profit, financial, managerial, and accounting-based management information and analytical systems.

Upon completion of the program, both a bachelor's and a master's degree will be awarded.

Admission Requirements and Retention Standards

1. Application for admission into the professional program must be made during the first four weeks of the second semester, junior year.

2. Applicants shall have: (a) completed the general education component of the curriculum plus ACC 301 and ACC 408 or ACC 324; and (b) earned the following GPA:

Overall	3.00
Accounting	3.25

3. Students must be admitted to The Graduate School prior to the beginning of the second semester, senior year. To be admitted, students must have at least 1,100 points based on the following formula: 200 times upper division GPA plus the total GMAT score.

Retention Standards

Retention in the professional program requires that a student maintain a 3.0 GPA in all hours attempted throughout the five year program. The faculty will assess each student's progress after the first semester and advise the student whether he/she should continue in the professional program or change to the four-year program.

Curriculum Requirements

GENERAL EDUCATION

	Cr. Hrs.
Oral and Written Communication Skills.....	12
Behavioral Science.....	6
Basic Business Skills.....	12
Computer Science.....	4
Mathematics and Statistics.....	7-9
Other Education.....	3-5
Total General Education	40% 60

GENERAL BUSINESS EDUCATION

Economic Theory/Monetary	
Economics (400-level).....	6
Legal and Social Environment.....	
Marketing.....	3
Finance.....	6
Management/Organizational Behavior.....	9
One additional course, reserved exclusively for graduate students outside the School of Accountancy.....	
	3
Total General Business Education	30% 45

ACCOUNTING EDUCATION

Financial.....	9
Managerial.....	6
Taxation.....	6
Auditing.....	6
Information Systems.....	6
Professional Issues.....	3
Accounting Electives.....	9
Total Accounting Education	30% 45
Total Hours	150

A minimum of 30 semester hours must be taken in courses carrying graduate credit. At least 20 semester hours must be in courses reserved exclusively for graduate students and at least 15 of these must be in accounting.

401G Accounting Theory.....	(3)
403G Auditing.....	(3)
408G Cost Accounting.....	(3)
410G Not-For-Profit Accounting.....	(3)
416G Accounting for Business Combinations.....	(3)
417G Income Taxation.....	(3)
503 Advanced Auditing.....	(3)
517 Corporate Taxation.....	(2)
518 Controllership.....	(3)
524 Advanced Accounting Information Systems.....	(3)
527 Taxation of Partnership and Subchapter Corporations.....	(2)
537 Estate and Gift Taxation.....	(2)
547 State and Local Tax Accounting.....	(2)
577 Taxation of Entities.....	(3)
601 Research in Accounting Theory.....	(3)
603 Attest Function.....	(3)
608 Advanced Managerial Accounting.....	(3)
610 Not-For-Profit and Regulatory Accounting.....	(3)
611 Professional Issues in Accounting.....	(3)
615 Advanced Professional Problems.....	(3)
617 Income Tax Development.....	(3)
619 Independent Study in Accounting.....	(1-3)
624 Accountometrics.....	(3)
628 Financial/Managerial Accounting.....	(3)
701 Seminar in Accounting.....	(3)
703 Topical Seminar in Auditing.....	(1)
704 Topical Seminar in Data Processing.....	(1)
705 Topical Seminar in Statistical and Mathematical Applications in Accounting.....	(1)

706 Topical Seminar in Accounting Theory.....	(1)
707 Topical Seminar in Taxation.....	(1)
708 Seminar in Management Accounting.....	(3)
709 Topical Seminar in Not-For-Profit and Regulatory Accounting.....	(1)
795 Independent Study in Accounting.....	(1-6)

Administration and Supervision

Graduate Faculty: Professors Charles Faber, James Ogletree and Eddy VanMeter.

Associate Member: Assistant Professor Ronald L. Threadgill.

Emeritus Professors: Fred Edmonds, James Kincheloe and Paul Street.

The Department of Administration and Supervision offers a program leading to the Specialist in Education (Ed.S.) degree. In cooperation with the Department of Curriculum and Instruction it offers a program in Instruction and Administration leading to the Doctor of Education (Ed.D.) degree. These advanced degree programs are designed to prepare candidates for leadership positions in public schools and other educational agencies or for the professorship in educational administration. The department participates in a Joint Doctoral Program with regional universities.

Course work for the Ed.D. in Instruction and Administration will consist of a minimum of 42 graduate credits beyond the master's (or equivalent) planned by the Major Professor and Advisory Committee based on the student's background, needs, and goals. All course work plans include work in the following:

- a) Instruction and Administration
- b) support work in education,
- c) research tool courses (minimum of 9 semester hours required), and
- d) support work outside of education.

For more information regarding the nature of the program check with the Director of Graduate Studies of the respective department.

In addition, the department also offers programs leading to professional certification and to Rank I classification (for Kentucky salary purposes) for various types of administrative and supervisory positions, as follows:

1. Superintendent of schools
2. Director of Pupil Personnel Services
3. Instructional Leadership: Supervisor of Instruction, Grades K-12
4. Instructional Leadership: Secondary Principal, Grades 9-12
5. Instructional Leadership: Middle School Principal, Grades 5-8
6. Instructional Leadership: Early Elementary Principal, Grades K-4

All certification programs require that the candidate must have earned a master's degree in an appropriate teaching field prior to being admitted to the program in Administration and Supervision.

The University of Kentucky is an active member of the University Council for Educational Administration, which was formed to promote, through inter-institutional cooperation, improvement in the professional preparation of administrative personnel. A number of services are available to graduate students through this membership.

Internships for graduate students can be arranged with public school systems and other educational agencies.

A limited number of graduate assistantships are available through the department. These involve up to 20 hours per week of service to the department or some other unit of the University, designed in such a way that the work contributes to the educational development of the student. A modest stipend is paid for this service. The University also provides some financial aid, in the form of loans and fellowships.

For further information, write to the Director of Graduate Studies in the Department of Administration and Supervision, College of Education, University of Kentucky, Lexington, Kentucky 40506, requesting one or more of the following sets of materials:

1. Admissions Procedures and Forms
 2. Requirements for Professional Certificate and Rank I Programs
 3. Requirements for the Specialist in Education degree
 4. Information on Doctoral Study in Instruction and Administration.
- 600 Organization and Administration of American Education.....(3)
 - 601 Administration of Educational Organizations.....(3)
 - 603 Constitutional and Legal Basis of Public School Administration.....(3)
 - 604 School Buildings and Equipment.....(3)
 - 605 School Law for Teachers.....(3)
 - 608 Internship in Educational Administration and Supervision.....(3)
 - 629 The Principal.....(3)
 - 633 Administration and Supervision of Instructional Programs.....(3)
 - 634 Administration of Educational Personnel.....(3)
 - 635 Business Administration and Finance of Public Education.....(3)
 - 639 The Supervisor.....(3)
 - 641 Organization And Administration of School Community Relations.....(3)
 - 649 The School Superintendency.....(3)
 - 749 Dissertation Research.....(0)
 - 769 Residence Credit for the Doctor's Degree.....(0-12)
 - 771 Seminar in Administration.....(1-3)
 - 785 Independent Work in School Administration.....(3)
 - 792 Research in Educational Administration and Supervision.....(3)

Agricultural Economics

Graduate Faculty: Professors Kurt R. Anschel, Robert D. Beck, Garnett L. Bradford, Russell H. Brannon, Joe T. Davis, David L. Debertin, Harry Hall, Fred E. Justus, Angelos Pagoulatos, D. Milton Shuffett and Eldon D. Smith.

Associate Professors: Barry W. Bobst, Loys L. Mather, Michael Reed and Jerry Skees.

Assistant Professor: Bernard Tew.

Associate Members: Professors Craig Infanger, Larry D. Jones and Harold Love. Associate Professor Steven K. Riggins. Assistant Professors Donald Reid and Forrest E. Stegelin.

Joint Appointments: Associate Professors Sun J. Chang and Donald H. Graves.

Emeritus Professors: Dana Card and Robert Rudd.

The Department of Agricultural Economics provides programs leading to the degrees of Master of Science, Master of Science in Agriculture and the Doctor of Philosophy. Graduate Faculty in the department provide for areas of emphasis in agricultural policy, price analysis, agricultural marketing, farm management, development, resource and production economics. Students must complete a core of courses in agricultural economics, economics and statistics.

The master's program is offered in either Plan A or Plan B. The thesis option (Plan A) requires a minimum of 24 hours of graduate credit and a research thesis. Plan B requires a minimum of 36 hours of graduate level credit. A final oral examination covering course work and the thesis (for students in Plan A) is also required.

In addition to the course work requirements, students in the Ph.D. program are required to take a comprehensive examination in microeconomics and macroeconomics administered by the Department of Economics. In addition students must complete qualifying examinations within the Department of Agricultural Economics in the areas of methods and methodology, conceptual analysis of current issues and a specialized field of study. The ability to conduct original research in agricultural economics, documented through the completion of a dissertation, is also required. Students in the Ph.D. program must demonstrate reading knowledge of a foreign language.

Graduate students have considerable flexibility to structure their program with respect to course work and research topics consistent with individual interests. Each student has a major professor and an advisory committee to assist in course work selection and in the thesis and dissertation research.

Students holding degrees in agricultural economics are employed by academic institutions; local, state, and federal agencies that deal with agriculture; private firms in

the agricultural and business sectors; and agencies and governments of foreign countries. These agricultural economists conduct research, develop extension services, teach classes, and serve as managers and administrators in various types of firms and agencies.

A graduate handbook is available from the Director of Graduate Studies which provides information regarding program content, degree options and available financial assistance.

441G	Agricultural Financial Management.....	(3)
445G	Introduction to Resource and Environmental Economics.....	(3)
501	Agricultural Market Organization and Performance.....	(3)
502	Advanced Farm Management.....	(3)
503	Economics of Agricultural Production and Resource Allocation.....	(3)
516	Rural Real Estate Appraisal.....	(3)
522	Cooperatives in Agribusiness.....	(3)
531	Agricultural Price Analysis.....	(3)
532	Agricultural Policy.....	(3)
533	Distribution Management in Agribusiness.....	(3)
535	Economic Development of Rural Regions of the United States.....	(3)
545	Natural Resource and Environmental Economics.....	(3)
580	Special Problems in Agricultural Economics.....	(1-3)
590	Introduction to Quantitative Economics I.....	(3)
606	Advanced Agricultural Marketing.....	(3)
610	International Trade in Agricultural Products.....	(3)
620	Advanced Production Economics I.....	(3)
621	Advanced Production Economics II.....	(3)
624	Advanced Quantitative Methods in Agricultural Economics.....	(3)
626	Agriculture and Economic Development.....	(3)
640	Advanced Agricultural Policy.....	(3)
645	Natural Resource Economics.....	(3)
646	Intertemporal Allocation of Natural Resources.....	(3)
650	Advanced Agricultural Prices.....	(3)
660	Research Methods in Agricultural Economics.....	(3)
661	Programming Models in Agricultural Economics.....	(3)
662	Quantitative Methods in Renewable Resource Management.....	(3)
670	Agribusiness Master's Seminar.....	(3)
699	Experiential Learning in Agricultural Economics.....	(1-6)
749	Dissertation Research.....	(0)
768	Residence Credit for Master's Degree.....	(1-6)
769	Residence Credit for Doctor's Degree.....	(0-12)
770	Agricultural Economic Seminars.....	(0)
780	Special Problems in Agricultural Economics.....	(1-3)

Agricultural Engineering

Graduate Faculty: Professors Billy Barfield, Blaine Parker, Joe Ross, Edward Smith, John Walker, Linus Walton, Larry G. Wells and Gerald White. Associate Professors Donald G. Colliver, and Frederick Payne.

Assistant Professors: Gary K. Felton, Richard Gates, William Eugene Murphy, Scott A. Shearer.

Associate Members: Professor George Duncan. Associate Professors Robert Fehr and Richard Warner.

The Agricultural Engineering Department offers programs leading to the M.S. in Agricultural Engineering (Plan A and Plan B available) and the Ph.D. degree. The department normally requires a grade point average of 2.8/4.0 for admission to its graduate program.

The agricultural engineering graduate program has as its objectives the development of:

1. The ability to plan and conduct research and design involving the application of the engineering science to biological and agricultural systems.
2. The understanding of the mathematical, physical, and biological sciences to permit the reading and understanding of the present and future literature in these and related fields.
3. The skills required to use precision instruments, techniques and computers in research and design.
4. The ability to make sound engineering and management decisions.
5. The ability to teach college level courses in agricultural engineering, particularly at the doctoral level.

In the attainment of the above objectives the graduate student will combine courses in agricultural engineering, the physical sciences, other engineering fields, and the biological sciences in developing a program of study. The advanced degrees, however, are primarily research degrees awarded for significant creative research accomplishment, not for the completion of a specified number of courses. Therefore, the program concentrates on a strong thesis or dissertation problem done under the supervision of the graduate faculty of the department. Strong course support is essential if the thesis or dissertation problem is to be properly undertaken and completed.

The design-oriented, non-thesis option is available for the master's degree.

406G	Physics of Plant and Animal Environment.....	(3)
417G	Introduction to Design of Agricultural Machinery.....	(3)
427G	Design of Agricultural Structures.....	(3)
437G	Soil and Water Conservation Engineering.....	(3)
447G	Processing and Food Engineering.....	(3)
480	Thermal Environmental Engineering.....	(3)
503	Animal Waste Management.....	(3)
505	Engineering Analysis.....	(3)
519	Plant, Soil and Machinery Relationships.....	(3)
525	Design of Structures for Biological Systems.....	(3)
536	Fluvial Hydraulics.....	(3)
537	Irrigation and Drainage Engineering.....	(3)
548	Advanced Agricultural Processing.....	(3)
550	Analysis and Simulation of Agricultural, Biological and Industrial Systems.....	(3)
568	Solar Energy Systems.....	(3)
599	Topics in Agricultural Engineering.....	(2-3)
606	Micrometeorology and Atmospheric Transport.....	(3)

618	Advanced Plant, Soil, and Machinery Relationships.....(3)
628	Advanced Design of Structures for Biological Systems.....(3)
635	Applied Statistical Methods in Water Resources.....(3)
648	Energy and Mass Transfer in Agricultural Processing.....(3)
658	Methodology and Instrumentation for Research.....(3)
660	Similitude in Engineering.....(3)
749	Dissertation Research.....(0)
750	Special Problems in Agricultural Engineering.....(1-3)
768	Residence Credit for Master's Degree...(1-6)
769	Residence Credit for Doctor's Degree...(0-12)
775	Seminar.....(0)
795	Thesis.....(0)
EGR 537	Numerical Analysis.....(3)
EGR 599	Topics in Engineering (Subtitle Required).....(1-3)
EGR 621	Computational Methods in Engineering.....(3)
EGR 622	Advanced Computational Methods in Engineering.....(3)
EGR 780	Topics in Engineering (Subtitle Required).....(1-3)

Agronomy

The Department of Agronomy offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees in Crop Science or Soil Science. The department also participates in an interdepartmental graduate program leading to the Ph.D. degree in Plant Physiology.

See Crop Science, Soil Science, or Plant Physiology for detailed information about these graduate programs.

Allied Health

502	Performance Evaluation in the Clinic and Laboratory.....(3)
595	Directed Studies.....(1-3)
660	Advanced Clinical Practicum in Allied Health.....(1-6)
670	Advanced Seminar in Allied Health.....(1-3)
690	Research Problems in Allied Health.....(3)

Allied Health Education and Research (AHER)

Through a cooperative program with the College of Education and the Departments of Curriculum and Instruction and of Educational Psychology and Counseling, AHER makes available the Master of Science in Education degree. Also, in these departments and others, the Doctor of Education degree is available to allied health specialists.

Persons with a baccalaureate degree in an allied health profession, with two years' work experience in their discipline and a desire to

teach in or administer an allied health education program, and who meet The Graduate School and departmental requirements, are eligible to make application for entry into these graduate programs.

Inquiries should be directed to the Program Director of Allied Health Education and Research, Department of Health Services, College of Allied Health Professions, and Research, Medical Center Annex 3, University of Kentucky, Lexington, Kentucky 40536-0218.

Anatomy

Graduate Faculty: Professors Peter P. Bosomworth, William B. Cotter, Raymond E. Papka, Stephen D. Smith, Harold H. Traurig and Miroslava Nikitovitch-Winer. Associate Professors Stephen T. DeKosky, William K. Elwood, Bruce Maley, Daniel H. Matulionis, Stephen W. Scheff, and Betty Siskin.

Associate Members: Assistant Professors Thomas E. Curry, Kurt Hauser and Robert E. Watson.

Emeritus Professors: Robert Benton and Lois Gillilan.

Joint Appointments: Professors Leo S. Demski and William R. Markesbery.

The program of graduate studies in anatomy is intended to provide educational opportunities for people with several different objectives. Some students will pursue graduate work in anatomy with the intention of teaching in departments of anatomy; some will have already obtained a professional degree, such as an M.D. or D.M.D., and may be interested in obtaining specific training in some region or system of the body to complement their professional education. Others may study in anatomy as a minor or simply for specific credit.

Preparation for graduate work in anatomy should include some course work in biological science along with other grounding in the sciences to the minimal extent of course work in quantitative analysis and organic chemistry, a term of calculus, and a year of college physics. Students with deficiencies in any of these areas may be admitted, but will be expected to complete their background early in the course of their graduate studies.

The department is prepared to offer the M.S. and Ph.D. degrees with areas of specialization in gross human anatomy, microscopic human anatomy, ultrastructure, embryology, endocrinology, genetics, neuroscience, and respiratory biology. Also, a major interest can center in tissues, organs, regions or systems of the body, in which, for example, professional graduates such as dentists or orthopedic surgeons might wish to take specific training. Certain students with special needs will, with permission of the Director of Graduate Studies, be permitted to work toward the M.S. degree on Plan B; however, in most cases students will follow Plan A.

Potential applicants for graduate work in anatomy are requested to write directly to the Director of Graduate Studies in the Department of Anatomy.

503	Independent Work in Anatomy.....(3)
511	Introduction to Anatomy.....(5)
512	Microscopy and Ultrastructure.....(4)
513	Developmental Anatomy.....(2)
516	Anatomy of the Nervous System.....(3)
529	Concepts of Morphology.....(2)
530	Combined Histology and Special Oral Microanatomy.....(5)
532	Systemic Gross Anatomy.....(2)
534	Anatomy of the Human Head and Neck.....(3)
536	Human Embryology, an Abbreviated Course.....(1)
538	Human Neuroanatomy, an Abbreviated Course.....(1)
600	Seminar in Anatomy.....(1)
611	Regional Gross Anatomy.....(8)
629	Techniques of Anatomical Research.....(2)
631	Advanced Gross Anatomy.....(3-5)
633	Advanced Developmental Anatomy.....(2-5)
634	Advanced Endocrinology.....(2-5)
636	Advanced Neuroanatomy.....(3-5)
662	Ultrastructural Anatomy.....(2-5)
749	Dissertation Research.....(0)
768	Residence Credit for Master's Degree...(1-6)
769	Residence Credit for Doctor's Degree...(0-12)
790	Research in Anatomy.....(1-12)

Animal Sciences

Graduate Faculty: Professors John Baker, James Boling, Neil Bradley, Gary Cromwell, Donald Ely, Virgil Hays, Roger Hemken, Clair L. Hicks, James Kemp, Bruce Langlois, Oran Little, George Mitchell, William Moody, Timothy S. Stahly, Frederick Thrift and Ray E. Tucker. Associate Professors Austin H. Cantor, Karl A. Dawson, Lee Edgerton, Robert J. Harmon, Russell B. Muntifer, and P.M. Zavas.

Associate Members: Professor Nelson Gay. Associate Professor Joseph O'Leary. Assistant Professors Debra K. Aaron, James Jackson, Stephen G. Jackson, Keith Schillo and William J. Silvia.

Emeritus Professors: Charles Barnhart, Ray Dutt, T.R. Freeman, Donald MacLury, Durward Olds, Dwight Seath, and Patch Woolfolk.

The degrees of Master of Science, Master of Science in Agriculture (Plan A and Plan B are available) and Doctor of Philosophy are available in the animal sciences. Programs in Animal Sciences are divided into the disciplinary areas of animal nutrition, animal breeding and physiology of reproduction, genetics and physiology. Special interests in beef cattle, dairy cattle, horses, poultry, sheep and swine may be pursued within these areas. Programs in food science offer specialization in meats, muscle biology, dairy technology, anaerobic microbiology, and food microbiology.

Candidates for the Ph.D. degree are required to have a reading knowledge of one modern foreign language and to declare a minor outside the department. On approval of the student's special committee, a minimum of 12 credits in not more than two

departments may be substituted for the minor.

400G	Special Topics in Animal Science/Food Science.....	(1-3)
404G	Sheep Science.....	(4)
406G	Beef Cattle Science.....	(3)
408G	Swine Science.....	(3)
410G	Horse Sciences.....	(3)
412G	Horse Husbandry Practices.....	(3)
420G	Dairy Cattle Science.....	(3)
442G	Poultry Science.....	(3)
462G	Artificial Insemination and Fertility of Farm Animals.....	(2)
550	Hormonal Regulation of Farm Animals.....	(3)
562	Advanced Genetics.....	(3)
564	Milk Secretion.....	(3)
580	Principles of Animal Nutrition.....	(3)
630	Advanced Meat Science.....	(4)
660	Physiology of Reproduction.....	(3)
662	Population Genetics.....	(3)
664	Advanced Animal Breeding.....	(3)
680	Laboratory Methods in Animal Nutrition and Meats.....	(4)
681	Energy Metabolism.....	(2)
682	Microbial Ecology of Digestion.....	(4)
683	Protein Metabolism.....	(2)
684	Advanced Ruminant Nutrition.....	(3)
685	Mineral Metabolism.....	(2)
686	Advanced Nonruminant Nutrition.....	(3)
687	Vitamin Metabolism.....	(2)
688	Equine Nutrition.....	(2)
749	Dissertation Research.....	(0)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
771	Animal Science Seminar.....	(1)
780	Special Problems in Animal Derived Foods.....	(1-4)
781	Special Problems in Genetics and Animal Breeding.....	(1-4)
782	Special Problems in Animal Nutrition.....	(1-4)
783	Special Problems in Reproductive Physiology (Subtitle Required).....	(1-4)
790	Research in Animal Derived Foods.....	(1-6)
791	Research in Genetics and Animal Breeding.....	(1-6)
792	Research in Animal Nutrition.....	(1-6)
793	Research in Reproductive Physiology (Subtitle Required).....	(1-6)
400G	Special Topics in Animal Science/Food Science.....	(1-3)
430G	Sensory Evaluation of Foods.....	(3)
530	Food Microbiology.....	(5)
532	Food Microbiology.....	(5)
534	Food Chemistry.....	(4)
536	Food Processing.....	(4)
538	Food Fermentation and Thermal Processing.....	(4)
630	Advanced Meat Science.....	(4)
636	Food Packaging.....	(2)
780	Special Problems in Animal Derived Foods.....	(1-4)
790	Research in Animal Derived Foods.....	(1-6)

Anthropology

Graduate Faculty: Professors William Adams, Billie R. Dewalt, Art Gallaher and Donald Hochstrasser. Associate Professors Susan Abbott, Albert Bacdayan, Kathleen Dewalt, Tom D. Dillehay, Kenneth Hirth, Sara A. Quandt, John Van Willigen and Helen Wiese. **Associate Member:** Assistant Professors Charles A. Hofling, Della McMillan, Mary L. Powell.

Adjunct Members: Associate Professor Rudolf Berle Clay. Assistant Professors Thomas Arcury, Carol A. Bryant and Richard W. Jeffries.

Joint Appointment: Professor Charles M. Coughenour. **Emeritus Professor:** Margaret Lautis.

The Department of Anthropology offers courses and research areas leading to the Ph.D. degree in the areas of applied social anthropology, culture history (ethnohistory and archaeology), and ethnology. The Applied Social Anthropology program offers specialization in developmental change and medical anthropology. The department offers two M.A. areas of specialization: a general anthropology degree (Plan A) certifying a broad background in anthropology, plus research competence in the collection and processing of primary data, and an applied anthropology degree (Plan B) which prepares the student for non-academic employment in cultural resource management or in applied cultural anthropology. The Plan A program requires a thesis and the Plan B program requires a practicum.

The Plan A master's degree also functions as the entry into the departmental Ph.D. program. All incoming graduate students without the M.A. are treated initially as candidates for this degree. These students are expected to satisfy the requirements for the M.A. program which include proseminars in each of the four subdisciplines of anthropology, a course in statistics, a course in the history of theory, and reading knowledge of one foreign language. Students who (1) excel in this program and (2) demonstrate satisfactory research competence, may petition to by-pass the master's thesis.

The Ph.D. course of study is individually planned for each student and depends on the student's interests, and the student's advisory committee's judgment of a student's needs. The student must pass a Ph.D. Qualifying Examination consisting of four days of written examinations and an oral examination. A dissertation based on original research carried out by the student is required, and a final oral examination is given based on the dissertation research. The program also requires (1) a reading knowledge of two foreign languages, or 2) a high degree of proficiency in reading, writing and speaking one foreign language. The second foreign language in option 1 may be replaced with any one of the following: 1) facility in a programming language (e.g., PL1, Fortran), 2) competence in the use of statistics and/or mathematics in anthropology, and 3) competence in linguistics sufficient to allow field work using an unwritten language.

Students who complete the requirements of the Plan B master's must meet the requirements of the Plan A degree before pro-

ceeding to the Ph.D. degree.

Incoming students who have earned a master's degree at other institutions will be expected to demonstrate the same broad background in anthropology as is required to earn the M.A. at the University of Kentucky. If deficient in this regard they may be required to take appropriate course work which is normally part of the M.A. program, before proceeding to work toward the Ph.D.

The following areas are represented in the individual research experience of members of the anthropology faculty: Southeast Asia, South Asia, North Africa and the Near East, East Africa, West Africa, Europe, Latin America, and North America. Several members of the faculty have expertise in the study of rural English-speaking subcultures, including Appalachia.

The department participates in interdisciplinary research in the University's Center for Developmental Change, in the Water Resources Institute, in the College of Agriculture and in the College of Medicine. The Department of Behavioral Science, College of Medicine, includes anthropologists on its staff, and students with interests in medical anthropology are encouraged to take behavioral science courses. The Department of Psychiatry provides additional opportunities for students with appropriate interests. There are also anthropologists in the College of Allied Health and the Department of Social and Philosophical Studies (College of Education). Anthropology graduate students with appropriate interests are eligible for assistantships in the above fields.

Department standards for admission to graduate work in anthropology include an undergraduate department over-all average of B or better, a satisfactory score on the verbal and quantitative tests of the Graduate Record Examination, completion of a separate departmental application form, and three letters of recommendation. Write the Director of Graduate Studies, Department of Anthropology, for additional information on departmental requirements and opportunities for financial assistance.

410G	Theoretical Perspectives in Anthropology.....	(3)
420	Contemporary Latin American Culture.....	(3)
421G	North American Indians.....	(3)
423G	Peoples of the Pacific Islands.....	(3)
428G	Contemporary Cultures and Societies in Southeast Asia.....	(3)
430G	Comparative Religious Systems.....	(3)
431G	Cultures and Societies of Sub-Saharan Africa.....	(3)
438G	Peoples and Societies of the Near East and North Africa.....	(3)
442G	New World Prehistory.....	(3)
450G	Symbols and Culture.....	(3)
470G	Regional American Ethnography.....	(3)
510	History of Anthropological Theory.....	(3)
512	Comparative Civilizations.....	(3)
515	Phonological Analysis.....	(3)

516	Grammatical Analysis.....	(3)
517	Special Topics in Linguistics (Subtitle Required).....	(3)
518	Language in Culture.....	(3)
519	Historical Linguistics.....	(3)
524	Mythology.....	(3)
525	Applied Anthropology.....	(3)
526	Psychological Anthropology.....	(3)
527	Culture Change.....	(3)
528	Dimensions of Aging.....	(3)
529	Survey of Medical Anthropology.....	(3)
530	Contemporary Latin American Cultures.....	(3)
532	Legal and Political Anthropology.....	(3)
533	Social Anthropology.....	(3)
534	The Southern Appalachians: A Sociological Interpretation.....	(3)
536	Peasant Societies.....	(3)
538	Economic Anthropology.....	(3)
539	Aging in Cross-Cultural Perspective.....	(3)
540	The History of Archaeology.....	(3)
541	Archaeological Theory and Method.....	(3)
542	North American Archaeology.....	(3)
550	Field Studies in Anthropology.....	(1-6)
555	Eastern North American Archaeology.....	(3)
560	Ethnographic Principles and Practice.....	(3)
580	Topics in Anthropology.....	(3)
581	Independent Work in Anthropology.....	(1-4)
582	Tutorial Seminar.....	(3)
585	Field Laboratory in Archaeological Research.....	(3-6)
605	Research Design.....	(3)
611	Seminar in Ethnology.....	(3)
612	Seminar in Culture History.....	(3)
613	Seminar in Physical Anthropology.....	(3)
614	Field Methods in Linguistics.....	(3)
620	Topics and Methods of Evaluation.....	(3)
621	Advanced Topics and Methods of Evaluation.....	(3)
637	Sociocultural Dimensions of Economics Development.....	(3)
640	Science, Agriculture, and Development.....	(3)
641	Gender Issues In Development.....	(3)
664	Cultural Issues in Mental Illness.....	(3)
670	Seminar on Role Theory.....	(3)
684	Farming Systems Research Methods.....	(3)
690	Advanced Pre-Field Study Seminar.....	(3)
710	Seminar in Physical Anthropology.....	(3)
720	Seminar in Cultural Anthropology.....	(3)
721	Seminar in Regional Ethnography.....	(3)
725	Seminar in Applied Anthropology.....	(3)
727	Seminar on Socio-Cultural Change.....	(3)
731	Seminar in Comparative Social Organization.....	(3)
741	Seminar in Regional Archaeology.....	(3)
742	Advanced Seminar in Culture History.....	(3)
749	Dissertation Research.....	(0)
750	Graduate Field Study in Anthropology.....	(1-6)
764	Topical Seminar in Psychological Anthropology.....	(3)
765	Research Problems in Medical Anthropology.....	(3)
767	Practicum in Applied Anthropology.....	(1-6)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
770	Seminar.....	(3)
774	Behavioral and Ecological Aspects of Human Nutrition.....	(3)
790	Research Problems in Anthropology.....	(3)

Art

Graduate Faculty: Professors James Pierce, Arturo A. Sandoval and John Tuska. Associate Professors Dennis Carpenter, Georgia Collins, Donald H. Hoffman, Gerald Ferstman, Elizabeth Finkenstaedt, Deborah Frederick, Marilyn Hamann, Christine Havice, Arthur Jones, Jane S. Peters, George Szekely, Robert Tharsing and Bernard Young.

Associate Members: Assistant Professors Mary Sheriff and Shirley Wiyee.

Emeritus Professor: Clifford Amyx.

The Department of Art offers graduate course work in three areas: Art Studio, Art History and Art Education. Both the Art History Area and the Art Education Area confer the Master of Arts degree with an area of specialization in each. Studio degree recipients are awarded the M.F.A.

Master of Arts

Area of Specialization in Art History: Students admitted to the graduate program in art history are expected to have completed course work equivalent to an undergraduate major in art history (no, less than 18 hours of art history and 12 hours of art studio). Work toward the master's degree is undertaken under Plan A (see Requirements for the Degrees of Master of Arts and Master of Sciences, Plan A) with a total of 24 hours including the required Graduate Art History Seminar (A-H 560). At least two-thirds of the required hours must be in Art History or Museum Training courses. A satisfactory thesis must be presented and a final examination passed. It is also required that the student offer either course work or substantial proof of ability to use more than one foreign language.

Area of Specialization in Art Education: Students admitted to the graduate program in art education are expected to have completed course work equivalent to an undergraduate major in Art Education (in no case less than 18 hours in Art Education and Education, 12 hours in Art History, and 18 hours in Art Studio). Prospective students who do not meet these requirements should seek the counsel of the Program Faculty Committee to make up deficits prior to acceptance into the program. (In addition, candidates must submit for review by the Program Faculty Committee, a portfolio of recent studio work (slides) and/or professional writing and other evidence of professional attainment, along with a 300-500 word statement of interest and/or objectives.)

Work toward the master's degree is pursued under Plan A (see Requirements for the Degrees of Master of Arts and Master of Sciences, Plan A). Successful candidates for

the Master of Arts with an area of specialization in art education are to satisfactorily complete: (1) thesis preparation demonstrating substantial research or theoretical inquiry in Art Education; (2) a finished thesis and an oral/written examination; (3) 30 credit hours of graduate course work to be divided as follows: (1) nine to 12 graduate credit hours in art education (excluding A-E 575, 577, 579, or other Art Education courses required for initial certification); (2) nine to 12 graduate credit hours in Art History or Art Studio; (3) the remaining nine graduate credit hours may be taken in related course work in the College of Fine Arts, the College of Education or elsewhere in the University as well as in the Department of Art.

Master of Fine Arts

Application for admission to graduate work leading to the degree Master of Fine Arts (MFA), including application for graduate assistantships, must be accompanied by a portfolio of recent studio work in the form of at least twenty 35mm slides of such work. This work must be submitted to the Art Department by March 15. Applicants wishing to be considered for fellowships should apply to the Graduate School and submit portfolios to the Art Department by February 1. In no case will this requirement be waived. Undergraduate art work must be substantially equal in quality, scope, and number of hours to the undergraduate major at the University of Kentucky.

The MFA degree will be awarded on the completion of sixty (60) hours of graduate course work. Of these, thirty hours must be at or above the 600 level and forty hours must be in regular courses (not independent study). In addition, the sixty credit hours will include thirty to thirty-six credit hours in Art Studio courses (including Graduate Studio Seminar and Studio Thesis Project), six to twelve credit hours in Art History and/or Art Education (a total of twenty-four credit hours or undergraduate and graduate Art History study is required), and up to eighteen credit hours in related graduate courses which may be taken outside the Department of Art in the College of Fine Arts or elsewhere in the University.

Students must also complete successfully a final one-person MFA exhibition of studio work and a visual documentation of that work together with an explanatory essay which is to be filed with the department prior to the exhibition. A total of six credits of A-S 767 (Studio Thesis Project) is required for the preparation of the exhibition and essay. Work toward the one-person exhibition will

begin at a time determined by the department.

The student will designate a major area with the advice of a senior professor at the outset of graduate work and will carry at least twelve hours in that area under the guidance of one professor selected as an adviser. A foreign language is not required, and the MFA degree is offered only according to Plan B.

Candidates for the MFA degree who hold an MA degree in studio work from another school will be required to complete a year's residence and eighteen credit hours of graduate work at the University of Kentucky, including two semesters of Graduate Studio Seminar and all other requirements for the degree. Total hours toward the MFA degree must equal sixty credit hours of graduate work.

ART 501	Basic Museum Training: Historical Art.....	(3)
ART 502	Basic Museum Training: Contemporary Art.....	(3)
ART 768	Residence Credit for Master's.....	(1-6)
A-E 515	Introduction to Art Therapy.....	(3)
A-E 525	The Elderly and the Arts.....	(3)
A-E 538	Advanced Arts and Crafts in the Elementary School.....	(3)
A-E 545	Topical Studies in Art Education (Subtitle required).....	(3)
A-E 572	Art Education Workshop.....	(1-6)
A-E 575	Art in Elementary Schools.....	(3)
A-E 577	Art in Secondary Schools.....	(3)
A-E 579	Seminar in Art Education.....	(2)
A-E 645	Topical Research in Art Education (Subtitle Required).....	(3)
A-E 670	School and Community Art.....	(3)
A-E 695	Independent Work: Art Education.....	(1-3)
A-H 510	Studies in Ancient Art.....	(3)
A-H 520	Studies in Medieval Art.....	(3)
A-H 530	Studies in Renaissance Art.....	(3)
A-H 540	Studies in Modern Art.....	(3)
A-H 550	Selected Topics in the History of Photography.....	(3)
A-H 560	Art History Seminar.....	(3)
A-H 580	Historical Techniques of Drawing, Painting and Printmaking.....	(3)
A-H 590	Topical Studies in Art History.....	(3)
A-H 592	Aesthetics.....	(3)
A-H 598	Coordinate Study.....	(3)
A-H 610	Problems in Ancient Art.....	(3)
A-H 620	Problems in Medieval Art.....	(3)
A-H 630	Problems in Renaissance Art.....	(3)
A-H 640	Problems in Modern Art.....	(3)
A-H 690	Topical Problems in Art History.....	(3)
A-H 780	Independent Work: Art History.....	(1-3)
A-S 510	Painting III.....	(3)
A-S 511	Painting IV.....	(3)
A-S 520	Printmaking III.....	(3)
A-S 521	Printmaking IV.....	(3)
A-S 530	Advanced Drawing.....	(3)
A-S 540	Graphic Design III.....	(3)
A-S 550	Fiber III.....	(3)
A-S 551	Fiber IV.....	(3)
A-S 560	Sculpture III.....	(3)
A-S 561	Sculpture IV.....	(3)
A-S 570	Ceramics III.....	(3)
A-S 571	Ceramics IV.....	(3)
A-S 580	Photography III.....	(3)
A-S 581	Photography IV.....	(3)

A-S 596	Workshop.....	(1-6)
A-S 610	Painting V.....	(3)
A-S 611	Painting VI.....	(3)
A-S 620	Printmaking V.....	(3)
A-S 621	Printmaking VI.....	(3)
A-S 650	Fiber V.....	(3)
A-S 651	Fiber VI.....	(3)
A-S 660	Sculpture V.....	(3)
A-S 661	Sculpture VI.....	(3)
A-S 670	Ceramics V.....	(3)
A-S 671	Ceramics VI.....	(3)
A-S 740	Problems in Fiber.....	(3)
A-S 750	Problems in Sculpture.....	(3)
A-S 767	M.F.A. Studio Thesis Project.....	(1-6)
A-S 770	Problems in Ceramics.....	(3)
A-S 780	Problems in Design.....	(3)
A-S 790	Topical Studies (Subtitle Required).....	(3)
A-S 793	Graduate Studio Seminar.....	(1)
A-S 799	Problems in Painting and Printmaking.....	(3)
FA 501	Arts-Study Tour.....	(3)

Behavioral Science

Graduate Faculty: Professor John Haley. Associate Professor John F. Wilson.

Joint Appointments: Professors Lawrence M. Busch, Ronald C. Dillehay, Thomas R. Ford, Eugene B. Gallagher, Thomas F. Garrity, Jon A. Hendricks, Gary W. Shannon, Robert Straus and Doris Wilkinson. Associate Professors Susan Abbott, Kathleen M. DeWalt, Phillip M. Moody, John Van Willigen and Helen J. Wiese. Assistant Professor Lynne Hall.

A program of concentration or a minor in medical behavioral science is offered for doctoral candidates in sociology, anthropology, psychology or other behavioral science disciplines through the Department of Behavioral Science in the Medical Center. The concentration has three objectives:

1. Research training in a health-medical setting, designed to afford each student an opportunity to learn the basic skills and approaches to research design, data acquisition, and data analysis, through personalized, supervised participation in one or more research projects. Such training is arranged to include experimental, survey, and case study methods, to insure the integration of research training with a student's program of courses and to culminate in a health-related topic for the doctoral dissertation. As far as possible, students in the concentration are provided office space in the Medical Center so that they may have ready access to resources and events.
2. An orientation to medical settings, including an enculturation to the social structure, attitudes, beliefs, values and objectives of health personnel and organization, and the nature of behavioral science research in these areas.
3. An orientation to the several behavioral sciences; to their areas of overlap and interrelation as well as to their discrete contents, theories and methods.

Students may elect to minor in medical behavioral science by taking a group of approved courses with the sponsorship and guidance of a designated faculty member.

The concentration is partially supported by a training grant from the National Institute of Mental Health under which selected students are provided with pre- and postdoctoral traineeship stipends. A limited number of assistantships are also available to qualified students.

527	Society and Health.....	(3)
529	Survey of Medical Anthropology.....	(3)
546	Social Factors in Mental Health.....	(3)
626	Survey of Health Psychology.....	(3)
670	Seminar on Role Theory.....	(3)
764	Topical Seminar in Psychological Anthropology.....	(3)
765	Research Problems in Medical Anthropology.....	(3)
766	Concepts in Medical Sociology.....	(3)
767	Research Problems in Medical Social Psychology.....	(3)
772	Topical Seminar in Medical Behavioral Science.....	(1-3)
774	Behavioral and Ecological Aspects of Human Nutrition.....	(3)
775	Human Response to Stress.....	(3)
776	Seminar in Dependency Behavior.....	(3)
777	Seminar in Mental Illness Concepts, Research and Policy.....	(3)
778	Behavioral Factors in Selected Diseases.....	(3)
779	Behavioral Factors in Death and Dying.....	(3)
790	Research in Medical Behavioral Science.....	(1-6)

Biochemistry

Graduate Faculty: Professors Charles Ambrose, S.K. Chan, Mary S. Coleman, Robert C. Dickson, Alfred Hu, Robert Lester, Robert E. Rhoads, Thomas Vanaman and Charles Waechter. Associate Professors Richard E. Galardy, John R. Glenney, Salvatore J. Turco and Alfred Winer.

Associate Members: Assistant Professors Giovanna Colombo, Phillip B. Jones and Judith C. Shelling.

Joint Appointment: Professor Boyd E. Haley.

Emeritus Professor: George Schwert.

The program of graduate studies in biochemistry is designed primarily for doctoral candidates who plan to pursue a research career in this field. Creative research in biochemistry requires broader training and more extensive laboratory experience than can be achieved at the master's level. Master's degrees are awarded only under unusual circumstances.

As preparation for graduate work in biochemistry, students should have completed courses in chemistry through physical chemistry, in mathematics through the calculus and must have had one year of work in physics and in one of the biological sciences.

Research interests of faculty members can be divided into the broad categories of (a) nucleic acids and molecular biology: protein synthesis, DNA enzymes, messenger RNA, DNA-drug interactions, yeast genetics, recombinant DNA, plant viruses, physical chemistry of DNA, somatic cell genetics,

purine metabolism, and transformation of plant cells; (b) cell surfaces: inositol-containing phospholipids, glyco-protein biosynthesis, cell surfaces of parasites; and (c) enzymes and proteins: transition state enzyme inhibitors, enzyme kinetics, emphysema-regulated proteins, and calcium-regulated proteins.

Inquiries concerning availability of financial support for graduate students should be addressed to the Director of Graduate Studies.

401G	Fundamentals of Biochemistry.....	(3)
501	General Biochemistry.....	(3)
502	General Biochemistry.....	(3)
503	Plant Biochemistry.....	(3)
504	Physical Biochemistry.....	(3)
517	Experimental Methods in Biochemistry.....	(4)
601	Special Topics in Molecular and Cellular Genetics.....	(1)
610	Biochemistry of Lipids and Membranes.....	(3)
611	Biochemistry and Cell Biology of Nucleic Acids.....	(3)
612	Structure and Function of Proteins and Enzymes.....	(3)
613	Biochemistry of Carbohydrates.....	(3)
615	Molecular Biology.....	(3)
618	Seminar in Biochemistry.....	(1)
619	Seminar in Biochemistry.....	(1)
640	Research in Biochemistry.....	(1-15)
749	Dissertation Research.....	(0)
769	Residence Credit for Doctor's Degree.....	(0-12)
780	Topics in Biochemistry.....	(1-3)

Thomas Hunt Morgan School of Biological Sciences

The Thomas Hunt Morgan School of Biological Sciences provides programs in biology leading to the Master's and Doctor of Philosophy degrees. The programs draw upon the various courses and faculty members in the biological sciences. The purpose of the graduate programs is to train students to be well-rounded biologists familiar with the main branches of the biological sciences and the auxiliary fields of mathematics, physics, and chemistry.

Students who receive a degree under one of the programs also will be sufficiently well trained in one of the major branches of biology to be able to conduct research in that special field, as well as broadly enough trained to participate in the teaching program of a department of biology. Students are expected to have a background of course work at least in the principal areas of biology, calculus and organic chemistry before starting doctoral programs.

Laboratory facilities and equipment are excellent for doctoral work in all branches of biology. A very good biology library containing over 32,000 volumes, including most

important American and foreign periodicals in the biological sciences is available in the Morgan School, and is supplemented by over 200,000 volumes devoted to biology in the libraries of the College of Agriculture, the College of Medicine and the Departments of Chemistry, Physics, and Geology. For appropriate courses see the listings in the various areas of biology.

Graduate offerings within the Thomas Hunt Morgan School of Biological Sciences are Ph.D. degree and Master of Science degree programs in Biology, and Ph.D. degree and Master of Science degree programs in Microbiology. School faculty also participate in a University-wide Plant Physiology and Toxicology program.

Biology

Graduate Faculty: Professors M.H. Aleem, T.C. Barr, Jerry M. Baskin, W.J. Birge, Branley Branson, E.C. Crawford, W.H. Davis, Leo Demski, Lester Goldstein, Judith A. Lesnaw, Willem Meijer, G. Rosenthal, and J.E. Siskin. Associate Professors P. Bonner, J.D. Clark, W. Cohen, P. Crowley, D.O. Harris, J.J. Just, J.M. Rawls, Andrew Sih, Shelton Steiner and G.L. Uglem. Adjunct Professor John Harley.

Associate Members: Associate Professor W.H. Martin. Assistant Professors Michael S. Dekin, Ricky Hirschhorn, Robert Craig Sargent and Jeffrey A. Schloss.

Joint Appointments: Associate Professor Robert N. Muller.

Emeritus Professors: R.W. Barbour, John Carpenter and James Edney.

The Thomas Hunt Morgan School of Biological Sciences provides programs in biology leading to the degrees of Doctor of Philosophy and Master of Sciences.

Work on the master's can be either Plan A or Plan B. Plan A is ordinarily required but Plan B is permitted under certain circumstances. Almost all areas of study encompassed by biology are available to the student.

Major work under the Ph.D. program would be arranged to suit the preparation, needs and interests of the individual student. The work could be, for example, in genetics, ecology and evolution, molecular biology, animal behavior, developmental biology, plant physiology, plant morphogenesis, systematics, cellular biology, radiation biology, animal physiology, neurobiology, etc.

The Director of Graduate Studies in Biology also serves as Director of the Master of Science Program in Biology.

Additional courses in Biological Sciences are offered through an affiliation agreement between the University of Kentucky and the Gulf Coast Research Laboratory (GCRL) in Ocean Springs, MS. Courses available

cover most aspects of marine and estuarine biology including independent research in these areas. Consult the Bulletin of the GCRL for further details (available at the School of Biological Sciences Office or from Dr. Leo S. Demski, On-Campus Coordinator for GCRL Programs).

404G	Principles of Genetics.....	(3)
411G	Models in Mathematical Biology.....	(3)
451G	Introductory Ecology.....	(4)
452G	Laboratory in Ecology.....	(1)
465G	Economic Botany.....	(3)
476G	General Microbial Physiology.....	(4)
494G	Immunobiology.....	(3)
502	Principles of Physiology Lecture.....	(5)
508	Evolution.....	(3)
510	Recombinant DNA Techniques Laboratory.....	(4)
515	General Cell Biology.....	(3)
522	Independent Work in Zoology.....	(3)
523	Zoology Seminar.....	(1)
524	Botany Seminar.....	(1)
525	Special Problems in Botany.....	(1-3)
529	Developmental Biology.....	(3)
530	Plant Physiology.....	(3)
531	Laboratory in Plant Physiology.....	(2)
535	Comparative Neurobiology and Behavior.....	(3)
537	Behavior and Neurobiology of Marine Animals.....	(4)
540	General Radiation Biology.....	(4)
542	Histology.....	(5)
544	Embryology.....	(5)
549	Comparative Endocrinology.....	(3)
550	Comparative Physiology.....	(5)
551	Plant Autecology.....	(4)
552	Taxonomy of Vascular Plants.....	(4)
553	Fish Biology.....	(4)
554	Mammalogy.....	(4)
555	Vertebrate Zoology.....	(4)
556	Marine Vertebrate Zoology and Ichthyology.....	(6)
557	Herpetology.....	(4)
558	Early Life History of Fishes.....	(4)
559	Ornithology.....	(4)
560	Biology of Insects.....	(4)
561	Medical Entomology.....	(4)
562	External Morphology of Insects.....	(4)
563	Parasitology.....	(4)
564	Insect Taxonomy.....	(4)
565	Limnology.....	(4)
566	Marine Ecology.....	(5)
567	Salt Marsh Plant Ecology.....	(4)
569	Marine Invertebrate Zoology.....	(6)
570	Invertebrate Zoology.....	(4)
571	Algology.....	(4)
572	Marine Botany.....	(4)
573	Mycology.....	(4)
574	Anatomy of Vascular Plants.....	(4)
576	Industrial Microbiology.....	(4)
578	Marine Microbiology.....	(5)
580	Metabolism of Microorganisms.....	(4)
582	Virology.....	(3)
585	Pathogenic Bacteriology.....	(4)
586	Laboratory in Pathogenic Microbiology.....	(2)
590	Gnotobiotic Methodology.....	(2)
593	Comparative Histology of Marine Organisms.....	(1-6)
595	Immunology Laboratory.....	(2)
596	Parasites of Marine Animals.....	(6)
597	Aquaculture.....	(6)
598	Fauna and Faunistic Ecology of Tidal Marshes.....	(4)
599	Coastal Vegetation.....	(3)

601	Special Topics in Molecular and Cellular Genetics.....	(1)
608	Behavioral Ecology.....	(3)
609	Community and Ecosystem Ecology.....	(3)
610	Organismal and Population Ecology.....	(3)
611	Biopathology.....	(3)
612	Biology of Aging.....	(3)
615	Molecular Biology.....	(3)
617	Advanced Microtechnique.....	(3)
619	Cytogenetics.....	(4)
621	Topics in Modern Botany.....	(1-3)
625	Seminar in Animal Navigation.....	(2)
627	Special Problems in Marine Biology.....	(1-6)
628	Special Topics in Marine Biology.....	(1-6)
630	Experimental Techniques in Plant Physiology.....	(3)
632	Advanced Cell Biology I.....	(3)
633	Advanced Cell Biology II.....	(3)
635	Insect Physiology and Internal Morphology.....	(4)
639	Research Projects in Biological Modeling.....	(3)
640	Biological Effects of Radiation.....	(3)
645	Special Topics in Endocrinology.....	(2)
655	Vertebrate Natural History.....	(4)
660	Advanced Animal Ecology.....	(3)
665	Insect Ecology and Behavior.....	(3)
667	Principles of Animal Systematics.....	(3)
670	Speciation.....	(3)
673	Experimental Mycology.....	(4)
685	Advanced Immunobiology.....	(3)
690	Bacteriology of Water and Sewage.....	(4)
707	Contemporary Topics in Immunology.....	(3)
714	Microbial Genetics.....	(4)
716	Metabolism of Microorganisms.....	(4)
720	Microbial Structure and Function.....	(3)
728	Developmental Genetics.....	(3)
732	Mineral Nutrition of Plants.....	(3)
734	Physiology of Growth and Development.....	(3)
735	Advanced Plant Physiology.....	(3)
740	Mammalian Radiation Biology.....	(2)
749	Dissertation Research.....	(0)
766	Graduate Research in Marine Biology-Master's.....	(1-6)
767	Graduate Research in Marine Biology-Doctor's.....	(1-6)
768	Residence Credit for Master's Degree.....	(1-6)
769	Residence Credit for Doctor's Degree.....	(0-12)
770	Seminar in Zoology.....	(1)
771	Seminar in Botany.....	(1)
772	Seminar in Microbiology.....	(0-1)
773	Seminar in Plant Physiology.....	(1)
774	Seminar in Genetics.....	(1)
776	Seminar in Marine Science.....	(1)
782	Advanced Virology.....	(3)
795	Research in Zoology.....	(1-6)
796	Research in Botany.....	(1-6)
797	Research in Bacteriology.....	(3-6)
798	Research in Bacteriology.....	(3-6)
BOT 768	Residence Credit for Master's Degree.....	(1-6)
ZOO 768	Residence Credit for Master's Degree.....	(1-6)
MB 749	Dissertation Research.....	(0)
MB 768	Residence Credit for the Master's Degree.....	(1-6)
MB 769	Residence Credit for the Doctor's Degree.....	(0-12)

Biomedical Engineering

Graduate Faculty: Professors Charles F. Knapp, James Lafferty, Stephen Lai-Fook. Associate Professor Pramode Bhagat.

Joint Appointments: Professors David C. Randall and Stephen D. Smith.

The Center for Biomedical Engineering offers M.S. and Ph.D. degrees in Biomedical Engineering. This graduate program emphasizes the application of engineering principles to the areas of medicine and biology and covers the broad aspects of mechanics, fluids, mass transfer, instrumentation, signal processing, systems analysis, materials and laboratory experimentation. The course work also stresses the practical application of these techniques to specific areas in rehabilitation engineering, sports medicine, artificial organ design, medical instrumentation, tissue regeneration and image processing. The program at the M.S. level provides the student with a combination of experiences in basic research, design, development, and practical applications. At the Ph.D. level, the focus is primarily on basic research. Students in the program are provided with excellent research opportunities through the facilities of the Wenner-Gren Research Laboratory and its close ties with other colleges of the University such as Medicine and Engineering.

Qualified students enroll in the graduate program through the Center for Biomedical Engineering and establish a course of study with the Center's core faculty and others from engineering and the life sciences. Entering students are expected to have an ABET accredited degree in engineering with some course work in the biological sciences. Applicants with degrees in physical or biological sciences may be accepted but are required to complete some course work in the undergraduate engineering curriculum before being admitted into the graduate program. The time required to complete the undergraduate courses typically is one to four semesters, depending upon the applicant's background. The M.S. program can be completed in three to four semesters. The Ph.D. program normally requires three to four years to complete. Acceptance in the Ph.D. program requires that students pass a qualifying examination administered by their special committee. Candidates for either degree must also successfully defend their thesis or dissertation before the degree is awarded.

The research and teaching activities of the program are concentrated at the Wenner-Gren Research Laboratory but also include facilities and faculty in the Departments of Physiology and Biophysics, Anatomy and Neurobiology, Cardiology, Surgery, Pharmacy, Pharmacology, Neurology, Physical Therapy, and Physical Education as well as the Departments of Chemical, Electrical and Mechanical Engineering. The Wenner-Gren

Laboratory is a highly interdisciplinary facility employing a full time staff whose members support senior investigators in biomedical engineering research. The laboratory is well equipped with bio-instrumentation, surgical facilities, and electronic and machine shops. It houses specialized facilities for biological material testing, rheology measurements, ultrasonic tissue characterization, instrumentation development, whole-body vibration and acceleration, image processing, and studies in biodynamics.

Further information may be obtained by writing to the Director of Graduate Studies, Center for Biomedical Engineering, Wenner-Gren Research Laboratory, University of Kentucky, Lexington, KY 40506-0070.

The Master of Science Degree in Biomedical Engineering requires successful completion of the core curriculum plus an acceptable thesis. A non-thesis option is also available with the approval of the Director of Graduate Studies.

CORE CURRICULUM

PGY 502	Principles of Physiology.....	(5)
BME 530	Biomedical Instrumentation.....	(3)
	Math Elective.....	(3)
BME 540	Biomedical Signal Processing I.....	(3)
BME 650	Musculoskeletal Biodynamics.....	(3)
BME 685	Biofluid Mechanics.....	(3)
BME 610	Biomedical System Analysis.....	(3)
	Technical Elective.....	(3)
BME 768	Residence Credit for Master's Degree.....	(1-6)
BME 652	Biomechanics of Trauma.....	(3)
BME 640	Biomedical Signal Processing II.....	(3)
BME 660	Biomedical Application of Ultrasound.....	(3)
BME 772	Seminar.....	(0)
BME 749	Dissertation Research.....	(0)
BME 781	Special Problems in BME.....	(3)
BME 769	Residence Credit for the Ph.D. Degree.....	(0-12)
CME 637	Biological Transport Phenomena.....	(3)
CME 680	Biochemical Engineering.....	(3)
MA 411G	Models in Mathematical Biology I.....	(3)
MA 511	Models in Mathematical Biology II.....	(3)
MA 639	Research Projects in Biological Modeling.....	(3)
PGY 660	System Physiology.....	(3)
PGY 622	Principles of Biophysics.....	(4)
EE 530	Robotics.....	(3)

Business Administration

Graduate Faculty: Professors John J. Bernardo, Roger Calantone, James Donnelly, Richard Furst, James Gibson, Andrew J. Grimes, Merlin Hackbart, Charles Haywood, James Marsden, Donald J. Mullineaux, Jon M. Shepard and Marc J. Wallace Jr. Associate Professors Keong Chew, Chenhua Chung, James W. Freeman, Keith H. Johnson, James R. Lang, Dennis T. Officer, Keith G. Provan and Steven J.

Associate Members: Associate Professor Michael Carpenter. Assistant Professors Hae W. Chung, Mark A. Davis, Nancy Brown Johnson, Rosemary R. Lagace, Willard McIntosh, Rakesh B. Sambharya, Tommy E. Whitler and A. Anthony diBenedetto.

Joint Appointment: Professor Philip K. Berger.

Business Administration Graduate Programs

Through the cooperation of the Departments of Accounting, Decision Science and Information Systems, Economics, Finance, Management, and Marketing, the College of Business and Economics offers the Master of Business Administration and Doctor of Business Administration degrees. Detailed information about these graduate programs of the College may be obtained by writing: Graduate Center Director, College of Business and Economics, University of Kentucky, 331 Business and Economics Building, Lexington, KY 40506-0034 or calling (606) 233-3592. A description of the graduate programs and graduate faculty of the Accounting and Economics Departments can be found in those sections of this bulletin. Faculty offering the MBA and DBA degree programs are members of the Departments of Accounting, Design Science and Information Systems, Economics, Finance, Management, and Marketing.

Master of Business Administration

The program leading to the Master of Business Administration degree has two basic objectives: (1) to enable the candidate to acquire an educational foundation for the development of socially responsible business management practices administration and (2) to equip the student for professional employment in a functional or other field of business upon completion of the program.

To attain these objectives, the program is designed to provide the student with the appropriate knowledge, understanding, skills and abilities, including:

1. An understanding of the processes of business administration and the methods needed by business administrators to effectively cope with uncertainty.
2. A knowledge of the economics of business enterprise and of the dynamic environment and culture in which business firms operate.
3. An understanding of quantitative methods of analysis in business decision making, in-

cluding the use of mathematical, statistical, and accounting approaches.

4. A knowledge of organizational relationships and behavior in business enterprises and of ways for promoting effective human relations.
5. The ability to solve complicated and realistic business problems by utilizing economics, business, and other professional literature and the specialized knowledge of other people, both in and out of the business firm, in order to present these findings effectively in both written and oral reports.
6. An understanding of the functional problems involved in operating a business enterprise, as pertaining to production, marketing and finance, and a knowledge in depth of the concepts, research findings, and currently useful generalizations within a functional area.

Requirements

1. The Graduate Management Admission Test (GMAT) must be taken prior to being admitted. Information on dates and locations where this national examination is given may be obtained from the Counseling and Testing Center, Frazee Hall, University of Kentucky, (606) 257-8701 or the Business and Economics Graduate Center, (606) 257-3592.

2. Admission to the MBA program presumes minimal prerequisite course work in the following areas (examples of acceptable courses at the University of Kentucky are given in parentheses):

Principles of Accounting (ACC 201, and ACC 202)

Introduction to Calculus (MA 123 or MA 113)

The prerequisites to the MBA program listed above may be satisfied by any of the following methods: (1) by taking the courses at the University of Kentucky or at another accredited institution; (2) by College Level Examination Program (CLEP) (proficiency) examinations, or (3) by correspondence. Prerequisites must be satisfied prior to admission to the MBA program.

3. The MBA program consists of the following 33-hour core and 15 hours of electives:

	Credits
MGT 611 Organizational Behavior.....	3
ECO 610 Managerial Economics.....	3
ACC 628 Financial/Managerial Accounting.....	3
MGT 650 Data Analysis for Decisions.....	3
MKT 600 Marketing Management.....	3
ECO 611 Business Conditions Analysis.....	3
FIN 600 Corporate Financial Policy.....	3
MGT 651 Quantitative Analysis for Decisions...	3
MGT 640 Legal and Regulatory Environment...	3
MGT 656 Production Management.....	3
MGT 699 Business Policy and Strategy II.....	3
	33
Electives	15
Total	48

The 15 hours of electives beyond the core

consist of approved elective courses providing indepth study in a functional area of business. Specialization elective courses are offered in marketing, management, finance, management information systems, and international business. Other specializations may be developed in the student's area of interest.

With the approval of the Director of Graduate Studies, students with undergraduate degrees in business may waive up to 12 hours of electives. Substitutions may also be made for core courses if substantial upper level undergraduate courses have been taken in the specific subject area.

4. Residence for at least two semesters at the University of Kentucky as a full-time student, or its equivalent as a part-time student.

5. Minimal average of grade B in all courses attempted for graduate credit after being admitted to The Graduate School. Students receiving two grades of C below a B average or one grade of E will be subject to dismissal from the MBA program.

6. Successful completion of a comprehensive final examination.

It is possible to earn the MBA degree as a full-time or as a part-time student. Full-time students attend day classes and take twelve hours each semester. Part-time students attend evening classes and take six hours each semester.

MBA/JD Option

A dual MBA/JD option is offered. Program information may be obtained from the Business and Economics Graduate Center.

Application for Admission

An applicant for admission to The Graduate School shall not be discriminated against because of race, color, religion, sex, marital status, national origin, age or beliefs. Students who wish to apply for admission to graduate study in the College of Business and Economics should (a) write to The Graduate School, University of Kentucky, Lexington, Kentucky 40506, and request application forms for admission and financial aid together with the Graduate Bulletin, and (b) write Graduate Center Director, 331 Business and Economics Building, College of Business and Economics, University of Kentucky, Lexington, Ky., 40506-0034 and request program applications and information.

Students who are graduates of a fully accredited institution of higher learning are eligible to apply for admission to The Graduate School under the following conditions:

Master's degrees: (1)MBA-Minimal requirements in order to be considered

for admission into the program are that the sum of the four-year grade-point average multiplied by 200 plus the GMAT score must exceed an admission index of 1100, i.e., $200 \times \text{GPA} + \text{GMAT}$ is greater than 1100, or the sum of the junior-senior grade-point average times 200 plus the GMAT score exceed 1150. Achievement of an 1100 admission index score does not guarantee an automatic admission; minimal GMAT scores (500) and minimal UGPA (3.0) do not guarantee automatic admission.

Additional requirements are:

1. Residence for at least two semesters at the University of Kentucky as a full-time student, or its equivalent as a part-time student.
2. Minimal average of grade B in all courses attempted for graduate credit after being admitted to The Graduate School. Students receiving two grades of C below a B average, one grade of E or failing to bring the grade-point average back up to a B average in one semester will not be subject to dismissal from the MBA program.
3. Successful completion of a comprehensive final examination.

Doctor of Business Administration

The mission of the doctoral program is to prepare students for successful academic careers. To accomplish this mission, the program prepares graduates to comprehend and evaluate research, perform research which advances knowledge and provide effective instruction, all within a business-related discipline. Specifically, the program is designed to provide:

- an understanding of the philosophies and basic methodological issues of academic inquiry;
- an understanding of the theoretical foundations and state-of-the-art research methods in a specific discipline; and,
- the ability to design and execute substantive research projects.

Requirements

1. Background Training in Business and Business Related Areas.
The DBA is designed to provide specialization beyond the master's level. The educational background of each candidate will be reviewed by the faculty in the student's major area, who identify any deficiencies. In most cases, an MBA from an accredited institution (AACSB accreditation) provides the necessary background.
Applicants with previous graduate

credits are evaluated generally according to the following rules, but each case is individually examined by the faculty of the appropriate DBA department. A minimal grade-point average of 3.2/4.0 is required on all previous graduate credits. Also, students without GMAT scores must take the exam before admission, reporting no less than a minimal score of 500.

2. Core Requirements (18 credit hours):
 - a. BA 762 Research Methodology.....(3)
 - b. Theoretical Foundations—Six Hours Selected by the Student From Among:
 - MGT 700 Administrative Science....(3)
 - ECO 660 Microeconomic Theory....(3)
 - ECO 661 Macroeconomic Theory....(3)
 - MGT 751 Management Science II....(3)
 - PSY 624 Social Psychology.....(3)
 - c. Research Tools—Nine Hours Selected by the Student From Among:
 - Six hours statistics sequence.....(6)
 - Research tools elective.....(3)
3. Major and Minor Field Requirements: The major field will consist of at least 15 hours of graduate credit course work including at least 6 credit hours of 700 level courses exclusive of the core. The minor field will consist of at least six hours of graduate credit course work. Currently available major and minor fields include:
 - Accounting
 - Finance
 - Management and Organizational Behavior*
 - Business Policy*
 - Human Resources Administration*
 - Management Science
 - Production/Operations Management
 - Management Information Systems
 - Marketing

*If the field is a major the other fields are not acceptable as minors.

A minor is available in Production and Taxation. Fields from outside departments closely related to the major field, e.g., sociology, statistics, computer science, international economics, may be selected as a minor field. All course work must be approved by the student's Director of Graduate Studies.
4. No foreign language is required.
5. Written and oral comprehensive examinations are required in the major and minor fields.
6. The dissertation will be based on original research on a significant topic. The dissertation will be defended in an oral examination.
7. Minimal average of grade B for graduate credit and in all courses attempted after being admitted to The Graduate School. Students obtaining two grades of C below a B average will

be dropped by the department.

For more information contact Graduate Center Director, 331 Business and Economics Building, (606) 257-3592.

BA 600	Fundamentals of Business Administration.....	(12)
BA 749	Dissertation Research.....	(0)
BA 762	Research Methodology.....	(3)
BA 768	Residence Credit for the Master's Degree.....	(1-6)
BA 769	Residence Credit for Doctor's Degree.....	(0-12)
BUS 519	Records Management.....	(3)
BUS 556	Business Reports and Communications.....	(3)
DIS 506	Productivity and Quality Control.....	(3)
DIS 530	Advanced Business Data Processing and Information.....	(3)
DIS 600	Production Management.....	(3)
DIS 650	Data Analysis for Decision.....	(3)
DIS 651	Quantitative Analysis for Decisions.....	(3)
DIS 750	Management Science I.....	(3)
DIS 751	Management Science II.....	(3)
DIS 752	Topics in Optimization.....	(3)
DIS 753	Seminar in Management Science.....	(3-6)
FIN 584	Financial Markets and Institutions.....	(3)
FIN 585	Bank Management.....	(3)
FIN 600	Corporate Financial Policy.....	(3)
FIN 637	Health Finance.....	(3)
FIN 645	Corporate Investment and Financing Policy.....	(3)
FIN 647	Working Capital Policy.....	(3)
FIN 650	Investment Management.....	(3)
FIN 680	Money, Interest and Capital.....	(3)
FIN 695	Individual Work in Finance.....	(1-6)
FIN 700	Seminar in Financial Theory.....	(3)
FIN 710	Decision Models in Finance.....	(3)
FIN 745	Seminar in Managerial Finance.....	(3)
FIN 750	Seminar in Investment Theory.....	(3)
FIN 763	Research, Design and Analysis.....	(3)
FIN 780	Seminar in Financial Institutions.....	(3)
FIN 791	Seminar in Finance.....	(3)
FIN 795	Independent Work in Finance.....	(1-6)
MGT 408G	World Business.....	(3)
MGT 508	International Commercial Policy.....	(3)
MGT 528	Contemporary Problems in Industrial Relations.....	(3)
MGT 529	Personnel Planning, Strategy and Policy.....	(3)
MGT 554	Advanced Business Data Processing and Information.....	(3)
MGT 556	Productivity and Quality Control.....	(3)
MGT 601	Research and Report Writing.....	(3)
MGT 608	Comparative International Management.....	(3)
MGT 611	Organizational Behavior.....	(3)
MGT 620	Personnel and Industrial Relations.....	(3)
MGT 640	Legal and Regulatory Environment.....	(3)
MGT 650	Data Analysis for Decisions.....	(3)
MGT 651	Quantitative Analysis for Decisions.....	(3)
MGT 656	Production Management.....	(3)
MGT 695	Individual Work in Management.....	(1-6)
MGT 698	Business Policy and Strategy I.....	(3)
MGT 699	Business Policy and Strategy II.....	(3)
MGT 700	Administrative Science.....	(3)

MGT 711	Organizations and External Systems.....(3)
MGT 712	Organizations and Individual Behavior.....(3)
MGT 713	Organization Development.....(3)
MGT 714	Seminar in Management Theory and Policy.....(3)
MGT 720	Seminar in Human Resource Management.....(3)
MGT 750	Management Science I.....(3)
MGT 751	Management Science II.....(3)
MGT 752	Seminar in Management Science.....(3-6)
MGT 763	Research, Design and Analysis.....(3)
MGT 773	Topics in Optimization.....(3)
MGT 781	Independent Work in Management.....(1-6)
MKT 600	Marketing Management.....(3)
MKT 601	Marketing Research.....(3)
MKT 620	Distribution Channel Systems.....(3)
MKT 621	Product Management.....(3)
MKT 622	Sales Management.....(3)
MKT 623	Marketing in Service and Nonprofit Organizations.....(3)
MKT 624	International Marketing Management.....(3)
MKT 695	Individual Work in Marketing.....(1-6)
MKT 700	Seminar in Marketing Management.....(3)
MKT 710	Seminar in Consumer Behavior.....(3)
MKT 720	Seminar in Marketing Theory.....(3)
MKT 763	Research, Design and Analysis.....(3)
MKT 771	Seminar in Business Administration.....(3)
MKT 781	Independent Work in Marketing.....(1-6)

Chemical Engineering

Graduate Faculty: Professors Dibakar Bhattacharyya, Charles E. Hamrin Jr., Gerald P. Huffman, Richard Kermodé, Edward D. Moorhead, Leonard Peters, Asit K. Ray and James T. Schrodt.

Associate Members: Assistant Professors Tate T. H. Tsang and Kimberly Ward.

The Department of Chemical Engineering provides programs leading to the M.S. in Chemical Engineering and Ph.D. degrees. For admission to either program, a G.P.A. of 2.8/4.0 on all undergraduate work is required. For the M.S. in Chemical Engineering, 24 hours of course work plus an acceptable thesis are required (Plan A). In certain exceptional cases as determined by the faculty, the thesis may be replaced by six additional hours of course work.

Unique and highly specialized M.S. areas of concentrated study are available in energy engineering, electrochemical engineering, air quality engineering, and environment pollution control. There is no language requirement for the M.S. in Chemical Engineering. For the Ph.D., a reading knowledge of French, German or Russian is required.

The doctoral student may specialize in one or more of the following areas:

- Atmospheric pollution control
- Biomedical engineering
- Chemical reactor design
- Cleaning and coal conversion processes

- Computational transport phenomena
- Electrochemical engineering/electrode processes
- Mathematical modeling
- Membrane separation
- Phase transformation
- Physics and aerosol chemistry
- Process control
- Thermodynamics
- Transport processes
- Water pollution control

A wide selection of thesis topics is available under the direction of the Chemical Engineering faculty. For further information on financial aid, requirements, and departmental laboratories and facilities, contact the Director of Graduate Studies.

505	Analysis of Chemical Engineering Problems.....(3)
515	Air Pollution Control.....(3)
530	Transport I.....(3)
550	Chemical Reactor Design.....(3)
552	Polymeric Materials.....(3)
554	Chemical and Physical Processing of Polymer Systems.....(3)
555	Advanced Chemical Engineering Process Design I.....(3)
560	Non-Newtonian Flow and Heat Transfer.....(3)
565	Energy Engineering.....(3)
570	Chemical Separation and Measurement for Chemical Engineers.....(3)
580	Design of Rate and Equilibrium Processes for Water Pollution Control.....(3)
606	Micrometeorology and Atmospheric Transport.....(3)
615	Advanced Air Pollution Control.....(3)
620	Equilibrium Thermodynamics.....(3)
621	Nonequilibrium Thermodynamics.....(3)
625	Properties of Gases and Liquids.....(3)
631	Transport II.....(3)
633	Diffusional Mass Transfer Operations.....(3)
635	Staged Mass Transfer Operations.....(3)
637	Biological Transport Phenomena.....(3)
638	Transport Phenomena in Packed and Fluidized Beds.....(3)
642	Advanced Process Control I.....(3)
650	Advanced Chemical Reactor Design.....(3)
665	Equilibrium and Rate Processes of Coal Conversion.....(3)
671	Basic Electrode Processes in Electrochemical Engineering.....(3)
680	Biochemical Engineering.....(3)
749	Dissertation Research.....(0)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
771	Seminar.....(0)
780	Special Problems in Chemical Engineering.....(3)
EGR 537	Numerical Analysis.....(3)
EGR 599	Topics in Engineering (Subtitle Required).....(1-3)
EGR 621	Computational Methods in Engineering.....(3)
EGR 622	Advanced Computational Methods in Engineering.....(3)
EGR 780	Topics in Engineering (Subtitle Required).....(1-3)

Chemistry

Graduate Faculty: Professors Carolyn Brock, D. Allan Butterfield, Audrey Companion, Paul Corio, William Ehmann, Robert Guthrie, Robert Kiser, William Markesbery, Kurt Niedenzu, James O'Reilly, Merle Pattengill, John Patterson, Donald Sands, Paul Sears, Stanford L. Smith, Walter Smith, David Watt and Steven W. Yates. Associate Professors Floyd Hollar, John P. Seleque and Joseph Wilson.

Associate Members: Assistant Professors Jeffrey R. Appling, Leonidas G. Bachas, Dennis Clouthier, Thomas F. Guare, John P. Richard and Robert T. Sullins.

Joint Appointment: Professor Davis S. Watt.

Emeritus Professors: R.E. Black, E.V. Brown, E.M. Hammaker, J.R. Meadow, W.K. Plucknett and W.F. Wagner.

The Department of Chemistry offers the Master of Science and the Doctor of Philosophy degrees. Plan A or B may be used to satisfy the requirements for the M.S. degree. Areas of specialization in chemistry offered are analytical, biological, inorganic, organic, physical, and radio-nuclear. All candidates for the Ph.D. degree are required to serve as a teaching assistant for one semester.

A satisfactory reading knowledge of normally French, German, or Russian is required for the M.S. and the Ph.D. degrees. Foreign language reading requirements may be satisfied by any of the means specified by The Graduate School. In addition, international students who are non-native speakers of English may satisfy the foreign language requirement by presenting a TOEFL score of 550 or better.

All new graduate students must take proficiency examinations in analytical, inorganic, organic, and physical chemistry. The results of these examinations are used as a guide in establishing the student's program of courses.

Master of Science Degree-Plan A (Thesis)

All Graduate School requirements must be met. In addition, course work should include four courses selected from among CHE 510, 538, 547, 548, and 626. Successful defense of a thesis describing original research of a caliber that could result in publication in referenced scientific journals is required by all M.S. Plan A students.

Master of Science Degree-Plan B

Students in the Department of Chemistry may satisfy the requirements for an M.S. degree by using Plan B, a course work M.S. Students wishing to follow this plan shall present for the approval of the Graduate Program Committee a program of courses that satisfies the Committee. This program of courses must meet distribution requirements within the four traditional areas of

chemistry, and include 6 or more credits of courses outside of Chemistry that are relevant to career goals.

Doctor of Philosophy Degree

Doctoral degrees are earned in the Department of Chemistry after a student has carried out productive and independent research on a problem that is of significant chemical interest. It is expected that the results of the dissertation work will be published in referenced scientific journals. All Graduate School requirements must be met. Subject to approval of the student's Advisory Committee, course work for the Ph.D. degree shall normally include CHE 510, 538, 547, 548, and 626. At least five credit hours must be in courses outside of the Department of Chemistry.

The Qualifying Examination consists of a written and an oral part. The written component of the Qualifying Examination consists of a series of cumulative examinations designed to test the application of fundamental principles and reasoning to literature or research problems. Scores of 3, 2, 1, or 0 may be obtained on each examination. Seven examinations per year in the areas of Analytical, Inorganic, Organic, and Physical Chemistry and four examinations per year in Biological and Radio-nuclear Chemistry are given. A Ph.D. student normally must attain 16 points within three years in order to take the oral part of the Qualifying Examination.

For further information on any degree program in Chemistry, please contact the Director of Graduate Studies.

410G	Principles of Inorganic Chemistry.....	(3)
440G	Physical Chemistry.....	(3)
441G	Physical Chemistry Laboratory.....	(2)
442G	Physical Chemistry.....	(3)
443G	Physical Chemistry Laboratory.....	(3)
444G	Physical Chemistry.....	(4)
490G	Chemistry for High School Teachers.....	(3)
510	Advanced Inorganic Chemistry.....	(3)
512	Inorganic Chemistry Laboratory.....	(3)
520	Radiochemistry.....	(3)
521	Radiochemistry Laboratory.....	(1-2)
522	Instrumental Analysis.....	(4)
532	Spectrometric Identification of Organic Compounds.....	(2)
533	Qualitative Organic Analysis Laboratory.....	(2)
538	Principles of Organic Chemistry.....	(3)
547	Advanced Physical Chemistry I.....	(3)
548	Advanced Physical Chemistry II.....	(3)
550	Physiological Chemistry.....	(4)
552	Physiological Chemistry.....	(4)
572	Seminar.....	(1)
580	Topics in Chemistry.....	(1-3)
602	Short Topics in Chemistry.....	(1-3)
610	Chemistry of the Transition Metals.....	(3)
612	Inorganic Chemistry of the Non-Metals.....	(3)
614	Organotransition Metal Chemistry.....	(3)
616	Nuclear Chemistry.....	(3)
620	Electrochemical Methods of Analysis.....	(3)

625	Optical Methods of Analysis.....	(3)
626	Advanced Analytical Chemistry.....	(3)
633	Advanced Organic Chemistry.....	(3)
635	Advanced Organic Chemistry.....	(3)
645	Chemical Thermodynamics.....	(3)
646	Chemical Kinetics.....	(3)
710	Topics in Inorganic Chemistry.....	(2-4)
726	Topics in Analytical Chemistry.....	(1-3)
736	Topics in Organic Chemistry.....	(2-4)
743	Molecular Structure.....	(3)
744	Statistical Thermodynamics.....	(3)
746	Topics in Physical Chemistry.....	(2-4)
749	Dissertation Research.....	(0)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
776	Graduate Seminar.....	(1)
780	Individual Work in Chemistry.....	(1-5)
790	Research in Chemistry.....	(1-12)

Civil Engineering

Graduate Faculty: Professors S.F. Adams, J.A. Deacon, J.A. Dearing, V.P. Drnevich, H. Gesund, B.O. Hardin, Y.H. Huang, J.W. Hutchinson, D. Kao, R.A. Lauderdale, Jerry G. Rose, S.T. Wang and D.J. Wood. Associate Professors George E. Blandford and Issam E. Harik.

Associate Members: Adjunct Associate Professor Robert C. Deen. Assistant Professors Lindell Ormsbee, Sergio Serrano, Manouchehr Vaziri and Yi-Tin Wang.

Emeritus Professor: Samuel A. Mory.

The Department of Civil Engineering offers the Master of Science in Civil Engineering (Plan A and Plan B available), Master of Civil Engineering (Plan B), and Ph.D. with specialization in the following areas:

- Civil Engineering Materials
- Construction engineering (MS in Engineering only)
- Fluid mechanics and applied hydraulics
- Geotechnical engineering
- Structural engineering
- Surveying and photogrammetry (M.S. only)
- Transportation engineering
- Water resources engineering
- Environmental engineering

These areas utilize courses from other departments and such inter-departmental programs are encouraged. Engineering Mechanics, Mechanical Engineering, Chemical Engineering, Agricultural Engineering, Mining Engineering, Mathematics, Computer Science, Geology, Biology, and Chemistry are some of the departments whose offerings contribute to the programs in Civil Engineering.

In addition to satisfying general Graduate School and College of Engineering admissions requirements (a GPA of 2.8/4.0 on all undergraduate work is normally required), applicants for admission to the M.S.C.E., M.C.E., and Ph.D. degree programs in Civil Engineering must have been awarded a Bachelor of Science degree from an

engineering program accredited by the Accrediting Board for Engineering and Technology, ABET.

This requirement may be waived for applicants who have been awarded bachelor's degrees other than engineering or from unaccredited engineering programs (including those offered by foreign institutions) if the applicant has received an acceptable score on the Advanced Engineering Test of the Graduate Record Examination.

Students with undergraduate majors not in engineering must also take a certain number of undergraduate remedial courses.

Neither the M.C.E., the M.S.C.E. degree nor the Ph.D. degree in Civil Engineering will be conferred unless the candidate has successfully completed, during his undergraduate and/or graduate careers, at least one basic course in at least four of the following seven areas: civil engineering materials, fluid mechanics, geotechnical engineering, surveying, structural or solid mechanics, transportation engineering, and water quality engineering.

It is also required that all applicants for admission must have a combined score on the verbal and quantitative portions of the Graduate Record Examination in excess of 1000. Foreign applicants whose native language is other than English must take the Test of English as a Foreign Language (TOEFL) and score at least 550 on it before they can be admitted.

The Department of Civil Engineering has many well equipped laboratories with active research programs in most areas. The research programs provide financial assistance for graduate students. In addition, financial assistance is available through teaching assistantships and a limited number of traineeships, fellowships and scholarships.

Additional information about the graduate program in Civil Engineering can be obtained by writing the Director of Graduate Studies, Department of Civil Engineering.

461G	Hydrology.....	(3)
471G	Soil Mechanics.....	(3)
485G	Design of Timber Structures, Formwork and Falsework.....	(3)
486G	Reinforced Concrete.....	(3)
487G	Steel Structures.....	(3)
505	Construction Project Planning and Management.....	(3)
506	The Engineer, The Law, and the Environment.....	(3)
511	Photogrammetry.....	(3)
517	Boundary Location Principles.....	(3)
518	Advanced Survey.....	(3)
521	Engineering Economy.....	(3)
531	Transportation Systems Operations.....	(3)
533	Railroad Facilities Design and Analysis.....	(3)
534	Pavement Analysis and Design.....	(3)
539	Transportation Systems Design.....	(4)
541	Hydraulic Structures.....	(3)

542	Applied Fluid Mechanics.....(3)
549	Engineering Hydraulics.....(3)
552	Water Quality Control Laboratory I.....(3)
556	Solid and Hazardous Waste Management.....(3)
559	Water Quality Control Facilities Design.....(3)
561	Urban Hydrology.....(3)
569	Water Resources System Design.....(4)
579	Geotechnical Engineering.....(3)
582	Advanced Structural Mechanics.....(3)
586	Prestressed Concrete.....(3)
589	Design of Structural Systems.....(4)
599	Topics in Civil Engineering (Subtitle Required).....(1-4)
612	Terrain Analysis.....(3)
630	Transportation Administration, Economics and Finance.....(3)
631	Urban Transportation Planning.....(3)
632	Traffic Law, Ordinances and Controls.....(3)
633	Air Transport Engineering.....(3)
634	Traffic Characteristics.....(3)
636	Operational Effects of Geometrics in Transportation.....(3)
637	Transportation Systems Modeling.....(3)
638	Multidisciplinary Accident Investigation and Reconstruction.....(3)
641	Mechanics of Liquid Flow in Pipes.....(3)
642	Open Channel Flow.....(3)
645	Highway Design, Construction and Maintenance.....(3)
651	Fundamentals of Water Quality Control I.....(3)
652	Fundamentals of Water Quality Control II.....(3)
653	Water Quality in Surface Waters.....(3)
661	Advanced Hydrology.....(3)
662	Applied Statistical Methods in Water Resources.....(3)
662	Stochastic Hydrology.....(3)
663	Water Quality Control Laboratory II.....(3)
664	Water Resources Planning.....(3)
665	Water Resources Systems.....(3)
667	Stormwater Modeling.....(3)
671	Advanced Soil Mechanics.....(3)
673	Finite Element Applications in Engineering.....(3)
676	Groundwater and Seepage.....(3)
678	Fluid Dynamics of Multiphase Systems.....(3)
679	Soil-Structure Dynamics and Earthquake Engineering.....(4)
682	Advanced Structural Analysis.....(3)
683	Experimental Structural Analysis.....(3)
684	Slab and Folded Plate Structures.....(3)
686	Advanced Reinforced Concrete Theory.....(3)
687	Advanced Metal Structures.....(3)
699	Topics in Civil Engineering (Subtitle Required).....(1-4)
749	Dissertation Research.....(0)
768	Residence Credit for Master's Degree.....(1-6)
769	Residence Credit for Doctor's Degree.....(0-12)
772	Experimental Methods in Soil Mechanics.....(3)
779	Advanced Geotechnical Engineering.....(3)
782	Dynamics of Structures.....(3)
784	Shell Structures.....(3)
789	Advanced Computer Aided Structural Analysis and Design.....(3)
790	Special Research Problems in Civil Engineering.....(1-6)

791	Special Design Problems in Engineering.....(1-6)
EGR 537	Numerical Analysis.....(3)
EGR 599	Topics in Engineering (Subtitle Required).....(1-3)
EGR 621	Computational Methods in Engineering.....(3)
EGR 622	Advanced Computational Methods in Engineering.....(3)
EGR 780	Topics in Engineering (Subtitle Required).....(1-3)

Classical Languages and Literatures

Graduate Faculty: Professors Hubert Martin and Louis Swift. Associate Professors Jane Phillips and Robert Rabel.

The Department offers the M.A. degree under both Plan A and Plan B. While there are no specific course prerequisites for admission, a strong undergraduate concentration in at least one classical language is recommended. The department offers a limited number of teaching assistantships.

Each student will normally elect either Latin literature, Greek literature, or a combination of the two as an area of concentration. Individualized course programs, however, are arranged for students who are preparing themselves for secondary school teaching or who have an additional interest in a field other than the Classics. A comprehensive examination is required of all degree candidates; and, except under special circumstances, they are expected to demonstrate either a reading knowledge of a modern foreign language or a substitute skill approved by the department. Most students complete their M.A. program in two years.

The University maintains an affiliation with the American School of Classical Studies at Athens and the American Academy in Rome, and meetings of the Kentucky Society of the Archaeological Institute of America are regularly held on the University of Kentucky campus. A computer tape of the basic classical authors included in the Thesaurus Linguae Graecae is available for teaching and research.

424G	Greek Literature in Translation.....(3)
425G	The Heroic Ideal: Greek and Roman Epic.....(3)
426G	Classical Drama: Tragedy and Comedy in Greece and Rome.....(3)
509	Roman Law.....(3)
511	Studies in Roman Philology.....(3)
512	Studies in Roman Philology.....(3)
522	Roman Republican Prose (Subtitle Required).....(3)
523	Roman Republican Poetry (Subtitle Required).....(3)
526	Roman Imperial Prose (Subtitle Required).....(3)

527	Roman Imperial Poetry (Subtitle Required).....(3)
530	The Teaching of Latin.....(3)
552	Greek Epic and Lyric Poetry.....(3)
553	Greek Philosophical Literature.....(3)
556	Greek Dramatic Literature.....(3)
557	Greek Historical Literature.....(3)
561	Studies in Greek Philology.....(3)
562	Studies in Greek Philology.....(3)
580	Independent Work in Classics.....(3)
600	Bibliography of Classical Scholarship.....(3)
601	Studies in Greek Literature I.....(3)
602	Studies in Greek Literature II.....(3)
603	Studies in Latin Literature of the Republic.....(3)
604	Studies in Latin Literature of the Empire.....(3)
768	Residence Credit for Master's Degree... (1-6)
790	Research in the Teaching of Classical Languages.....(3)

Clinical Nutrition

Graduate Faculty: Professors James W. Anderson and Paul A. Thornton. Associate Professor Geza Bruckner. Associate Member: Assistant Professor Gilbert A. Boissonneault.

The Master's Degree Program in Clinical Nutrition provides an opportunity for graduate study in the fundamentals of clinical nutrition. Plan B is offered. The curriculum is designed specifically to provide practical experience in nutrition in the treatment of illness and the maintenance of health and to deepen the student's foundation in the sciences fundamental to nutrition. It is intended primarily for those who wish to undertake careers in clinical nutrition in university hospitals and medical centers; for those who intend to teach in the field of clinical nutrition; and for those who plan careers as members of a research team in clinical nutrition and metabolism.

The program is interdisciplinary in nature. The faculty is drawn from the basic sciences as well as the clinical departments of medicine and surgery. The University Hospital and its related clinical facilities will be used for clinical instruction.

A minimum of 30 credit hours will be required to complete the degree. No language is required. It is expected that students entering this program shall have completed the necessary courses which are prerequisites for course work offered within the program.

I. Required Courses

		Crs
CNU 601	Clinical Nutrition.....(4)	
CNU 602	Current Topics in Clinical Nutrition.....(1)	
CNU 701	Advanced Clinical Nutrition.....(3)	
CNU 702	Advanced Clinical Nutrition Internship.....(4)	
CNU 780	Clinical Nutrition Research.....(1-5)	
CNU 781	Clinical Nutrition Seminar.....(1)	

CNU 782 Independent Study.....	(1)
Total	(15-19)

II. Suggested courses to complete the 30 hours' credit. (In consultation with the program director or adviser the student will select certain of the courses listed.)

II. Suggested Courses

BCH 401 Fundamentals of Biochemistry.....	(3)
PGY 412G Principles of Human Physiology.....	(4)
CNU 603 Nutritional Immunology.....	(2)
CNU 604 Lipid Metabolism.....	(2)
ASC-NFS 685 Mineral Metabolism.....	(2)
ASC 687 Vitamin Metabolism.....	(2)

Electives sufficient to complete 30 credits as required.

590 Gnotobiotic Methodology.....	(2)
601 Clinical Nutrition.....	(4)
602 Current Trends in Nutrition.....	(1)
603 Nutritional Immunology.....	(1-2)
604 Lipid Metabolism.....	(1-2)
701 Advanced Clinical Nutrition.....	(2)
702 Advanced Clinical Nutrition.....	(2)
780 Independent Study.....	(1)
781 Independent Study.....	(1)
781 Clinical Nutrition Seminar.....	(1)
782 Independent Study.....	(1)

Clinical Pastoral Counseling

Graduate studies in areas relevant to Clinical Pastoral Counseling are possible. Coordination is facilitated by faculty in the Department of Health Services, College of Allied Health Professions.

For further information, contact the Director of Clinical Pastoral Education, College of Allied Health Professions.

501 Perspectives in Religion and Health.....	(3)
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Communication

Graduate Faculty: Professors Robert Bostrom, Douglas Boyd, Lewis Donohew, Philip C. Palmgreen, Joseph Ripley and Ramona Rush. Associate Professors James L. Applegate, John Baseheart, Thomas R. Lindlof, Roy Moore, Beverly Sypher, Howard E. Sypher and Norman Van Tubergen.

Associate Members: Assistant Professors Joachim Knuf, Milton J. Shatzer, James B. Weaver.

Emeritus Professors: Robert Murphy and Bruce Westley.

The College of Communications offers programs leading to the Master of Arts (either Plan A or Plan B) and Doctor of Philosophy degrees. Emphasis is on the study of communication behavior at various levels, including intrapersonal processes, interpersonal and small group communication, communication in organizations, and communication at the mass or social system level. The program is designed to serve the needs of students whose goals may include

teaching and academic research, professional research, or communication careers in the media or other organizations. Students with no previous course work in a communication area may be required to take undergraduate work without graduate credit.

Master of Arts

All students will be required to take 12 core credit hours consisting of Proseminar in Communication (CJT 601), Communication Theory (CJT 651), and Communication Research Methods (CJT 665), plus Statistics 570B or its equivalent as determined by the Director of Graduate Studies.

Students may complete 30 credit hours of course work, including six credit hours of CJT 768 (Residence Credit for the Master's Degree), and a thesis (Plan A) or 30 hours of course work with no thesis (Plan B). Plan A students are required to complete an oral and/or written final examination, while Plan B students complete both a written and an oral examination, in the semester in which the degree is to be awarded.

At least 21 credit hours of the minimum requirements for the master's degree must be from offerings within the College of Communications (both Plan A and Plan B). Plan A students may include six hours of CJT 768 in the 21 hours, since the thesis involves work in an area of communication. Also, at least 21 credit hours of the minimum requirements must be in courses at the 600 or 700 levels (both Plan A and Plan B). Plan A students may include six hours of CJT 768 in the 21 hours. No more than 3 credit hours in Plan A and 6 credit hours in Plan B (of the minimum requirements) may be earned in directed study, directed reading, or internship courses (e.g., CJT 696, CJT 700, CJT 781, CJT 790).

Doctor of Philosophy

The Ph.D. program emphasizes communication as a social science. Graduates are prepared for university positions and careers in government, the media and other organizations as researchers, consultants and policy makers. Students must demonstrate general knowledge of communication, as well as competence in a core area of specialization. Current core communication areas include interpersonal; intrapersonal; organizational; mass communications; communication perspectives, including legal and historical aspects; communication technologies; international and intercultural communication; and political communication.

Students also must demonstrate a thorough grasp of research methods and statistics, and must take course work in a cognate area outside the College of Com-

munications. Students are required to demonstrate, in a manner satisfactory to The Graduate School, reading knowledge of one modern foreign language, ordinarily French, German, or Russian.

Each student works with a major professor and an advisory committee to plan course work and complete the dissertation. The committee also administers the qualifying examination and the final oral examination. The qualifying examination consists of a written and oral examination over general communication, the core area of specialization, research methods/statistics, and the cognate area.

Standards for admission to the doctoral program are similar to those of The Graduate School, including satisfactory scores on the verbal and quantitative portions of the Graduate Record Examination. For additional information about program requirements and opportunities for financial assistance write to the Director of Graduate Studies, College of Communications.

COM 519 International and Intercultural Communication.....	(3)
COM 525 Organizational Communication.....	(3)
COM 549 Social Processes and Effects of Mass Communication.....	(3)
COM 550 Introduction to Communications Research.....	(3)
COM 551 The Individual and the Communication Process.....	(3)
COM 552 Studies in Interpersonal Communication.....	(3)
COM 553 Mass Communication and Social Issues.....	(3)
COM 554 Seminar in Communications.....	(3)
COM 581 Communication Processes in Small Groups.....	(3)
COM 582 Persuasion.....	(3)
COM 583 Studies in Argumentation.....	(3)
COM 584 Teaching of Speech Communication.....	(3)
COM 601 Proseminar in Communication.....	(3)
COM 605 Introduction to Information Science.....	(3)
COM 607 Evaluating and Communicating Information.....	(3)
COM 608 Mass Communications and Society.....	(3)
COM 614 Information Storage and Retrieval Systems.....	(3)
COM 615 Information Systems Design.....	(3)
COM 631 Proseminar in Interpersonal Communication.....	(3)
COM 650 Signs and Sign Behavior.....	(3)
COM 651 Communications Theory.....	(3)
COM 665 Communications Research Methods.....	(3)
COM 681 Communications Historiography.....	(3)
COM 696 Internship in Communications.....	(3)
COM 700 Directed Reading in Communication.....	(1-3)
COM 701 Seminar in Communication Perspectives.....	(3)
COM 705 Seminar: Information Sciences.....	(3)
COM 721 Seminar in Intrapersonal Communication.....	(3)
COM 725 Seminar in Organizational Communications (Subtitle Required).....	(3)
COM 730 Seminar in Mass Media and Public Policy.....	(3)

COM 731	Seminar in Interpersonal Communication.....(3)
COM 740	Dissertation Research.....(3)
COM 741	Seminar in Multi-Actional Communication.....(3)
COM 749	Dissertation Research.....(0)
COM 765	Communication Research Design.....(3)
COM 767	Qualitative Methods in Communication Research.....(3)
COM 768	Residence Credit for the Master's Degree.....(1-6)
COM 769	Residence Credit for Doctor's Degree.....(0-12)
COM 780	Special Topics in Communication.....(3)
COM 781	Directed Study in Communication.....(1-6)
COM 790	Research Problems in Communication.....(1-6)
JOU 485G	Community Journalism.....(3)
JOU 501	News Reporting.....(3)
JOU 503	Copyreading and Editing.....(3)
JOU 507	Feature Writing.....(3)
JOU 509	Magazine Article Writing.....(3)
JOU 510	Publications Production.....(3)
JOU 511	Editorial Writing.....(3)
JOU 513	Supervision of High School Publications.....(1-3)
JOU 521	Telecommunications Regulations.....(3)
JOU 527	The Public Affairs Program.....(2)
JOU 531	Law of the Press.....(3)
JOU 532	Ethics of Journalism and Mass Communication.....(3)
JOU 535	History of Journalism.....(3)
JOU 537	Seminar in Public Opinion.....(3)
JOU 539	Reporting Public Affairs.....(3)
JOU 541	Public Relations.....(3)
JOU 543	Advertising Regulation.....(3)
JOU 545	Case Studies in Public Relations.....(3)
JOU 567	Advertising and Electronic Media.....(3)
JOU 579	Proseminar in Radio and Television.....(2)
JOU 581	Broadcast Advertising Message Preparation.....(3)
JOU 591	Advertising Campaigns.....(3)
JOU 597	Special Topics in Journalism (Subtitle Required).....(1-3)
JOU 598	Telecommunications Topical Seminar.....(2)
JOU 599	Advanced Writing for the Mass Media.....(3)
TEL 464G	Economics of Regulated Industries.....(3)
TEL 501	Telecommunications Regulations.....(3)
TEL 504	Telecommunications Management.....(3)
TEL 505	Advance Topics in Telecommunications Policy.....(3)
TEL 507	The Public Affairs Program.....(2)
TEL 508	Advanced Research Methods.....(3)
TEL 510	Advertising and Electronic Media.....(3)
TEL 511	Telecommunications Instructional Systems.....(3)
TEL 513	Social Effects of Telecommunications.....(3)
TEL 520	Economics of Information.....(3)
TEL 530	Pre-seminar in Telecommunications.....(3)
TEL 545	Entertainment Functions of the Mass Media.....(3)
TEL 599	Telecommunications Topical Seminar.....(2)

Community Health

Persons interested in graduate education in Community Health/Health Administra-

tion should contact the department directly.

500	Public Health Sanitation.....(3)
501	Public Health.....(3)
502	Organization and Supervision in Health Care Delivery.....(3)
510	Organization of the Long-Term Care Sector.....(3)
511	Independent Study in Community Health.....(1-3)
522	School and Community Health.....(2)
600	Epidemiology.....(3)
601	Overview of the Health Care Delivery System.....(3)
611	Social and Behavioral Aspects of Health Care.....(3)
621	Health Economics.....(3)
622	Health Program Planning and Evaluation.....(3)
631	Health Policy Development.....(3)
637	Health Finance.....(3)
775	Special Topics in Health Administration.....(2-3)
785	Independent Study in Health Administration.....(1-3)

Computer Science

Graduate Faculty: Professors Yuri Breitbart, Forbes Lewis, Wiktor Marek and A.R. Newbery. Associate Professors Raphael A. Finkert, Miroslaw Truszczynski and Grzegorz W. Wasilkowski.

Associate Members: Associate Professor Anthony Q. Baxter. Assistant Professors Tom Altman, Fuhua Cheng and Ardeshir Goshtasby.

Joint Appointments: Professors Kenneth K. Kubota and James Wells. Associate Professor Raymond H. Cox. Emeritus Professor: Henry Thacher, Jr.

The Department of Computer Science offers programs of study leading to the degrees of Master of Science (Plan A or Plan B) and Doctor of Philosophy. The prospective candidate for the master's degree should note that in addition to the general requirements stated in the first pages of this Bulletin, admission to the master's program is quite competitive. Knowledge of one foreign language in which there is a substantial computer literature is a requirement for the master's degree.

The Doctorate in Computer Science is a research degree granted primarily on the presentation of a substantial research achievement. In order to be admitted to candidacy for the degree, in addition to satisfying the requirements of The Graduate School, students must present evidence of proficiency in two foreign languages and pass with distinction the departmental comprehensive examination. At the discretion of the department, they may also be required to present evidence of successful completion of a major programming achievement.

The areas of research which are actively pursued within the department include: artificial intelligence, discrete computation mathematics, numerical methods, programming and operating systems, and theory of

computation. Courses in these and other areas are available to permit the student to pursue a course of study of sufficient breadth and depth to prepare him to perform independent research.

415G	Graph Theory.....(3)
416G	Principles of Operations Research I.....(3)
420G	Compilers for Algorithmic Languages.....(3)
450G	Fundamentals of Programming Languages.....(3)
460G	Immigration into Computer Science.....(3)
461G	Minicomputers.....(3)
470G	Systems Software.....(3)
505	Data Base Management Systems.....(3)
510	Discrete Computer Mathematics I.....(3)
522	Matrix Theory and Numerical Linear Algebra I.....(3)
532	Finite Precision Arithmetic.....(3)
537	Numerical Analysis.....(3)
538	Numerical Analysis II.....(3)
540	Systems Simulation.....(3)
541	Advanced Compiler Design I.....(3)
545	Computer Graphics.....(3)
550	Introduction to Coding Theory.....(3)
560	Artificial Intelligence.....(3)
570	Operating Systems Design.....(3)
575	Theoretical Aspects of Computing.....(3)
580	Algorithm Design.....(3)
585	Intermediate Topics in Computer Science.....(3)
587	Microcomputer Systems Design.....(3)
605	Advanced Information Processing.....(3)
612	Independent Work in Computer Science.....(1-3)
615	Computer Architecture and Microprogramming.....(3)
620	Numerical Approximation and Curve-Fitting.....(3)
622	Matrix Theory and Numerical Linear Algebra II.....(3)
631	Error Analysis and Certification.....(3)
635	Image Processing.....(3)
636	Computer Vision.....(3)
641	Advanced Compiler Design II.....(3)
650	Problem Seminar.....(3)
655	Design of Programming Languages.....(3)
660	Artificial Intelligence.....(3)
660	Topics in Artificial Intelligence (Subtitle Required).....(3)
670	Natural Language Processing.....(3)
675	Theory of Computation.....(3)
680	Seminar in Computer Science.....(2)
682	Switching Theory.....(3)
683	Finite-State Machines.....(3)
685	Special Topics in Computer Science.....(3)
687	Special Topics in Software.....(3)
689	Special Topics in Numerical Computing.....(3)
690	Operating Systems Theory.....(3)
768	Residence Credit for Master's Degree.....(1-6)

Crop Science

Graduate Faculty: Professors Glenn B. Collins, Paul L. Cornelius, Dennis B. Egli, A. J. Hiatt, Paul Legg, Charles G. Poneleit, Norman L. Taylor, Dennis M. Tekrony and Elizabeth Williams. Associate Professors Harold R. Burton, Michael Collins, Charles T. Dougherty, Mark T. Nielsen, Todd Pfeiffer, David A. VanSanford and William W. Witt. Adjunct Associate Professor Charles T. MacKown.

Associate Members: Assistant Professors Michael Barrett, Larry Grabau and David Hildebrand. Adjunct Assistant Professors Steven Crafts-Brandner and Georgia

C. Eizinga. Extension Professors Morris J. Bitzer, Andrew J. Powell and Jones H. Smiley.

Joint Appointments: Professors Lowell P. Bush, George M. Cheniac, Dean E. Knavel, Bart A. Thielges and George Wagner. Associate Professors Jack W. Buxton and John C. Snyder. Assistant Professors Joseph Chappell, Arthur C. Hunt, David B. Wagner and Leslie Weston. Adjunct Assistant Professor Michael E. Salvucci.

Emeritus Professors: Robert C. Buckner, W. G. Duncan, Joseph Freeman, G. W. Schneider, T. H. Taylor, William Templeton, and G. T. Webster.

The interdepartmental Crop Science graduate program offers graduate work leading to the Master of Science, Master of Science in Agriculture, and Doctor of Philosophy degrees with areas in plant breeding and genetics, crop physiology and management, turf science, cellular and molecular genetics, seed science and technology and weed science. Faculty are from the Departments of Agronomy, Forestry and Horticulture in the College of Agriculture. For the M.S. degree, 24 hours of course work plus an acceptable thesis are required (Plan A). In certain cases, the requirements may be satisfied by substituting 12 additional hours of course work for the thesis (Plan B). Work leading to advanced degrees must conform to the general rules and regulations of The Graduate School. A reading knowledge of one foreign language is required for the Ph.D. degree.

Individual programs are developed to include a strong course work component and a meaningful research experience. A strong undergraduate background in the agricultural and biological sciences is required for all degree candidates.

A Crop Science minor is offered and must be administered by a member of the Graduate Faculty and requires a minimum of 9 credit hours of graduate level plant science courses.

502	Ecology of Economic Plants.....	(3)
510	Ecology and Utilization of Grassland.....	(4)
515	Turf Management.....	(3)
556	Seed Technology.....	(2)
557	Seed Biology.....	(2)
560	Soil-Plant Relationships.....	(3)
562	Advanced Genetics.....	(3)
597	Special Topics in Agronomy (Subtitle Required).....	(1-3)
599	Special Problems in Agronomy.....	(1-4)
601	Special Topics in Molecular and Cellular Genetics.....	(1)
619	Cytogenetics.....	(4)
630	Experimental Techniques in Plant Physiology.....	(3)
654	Crop Physiology.....	(3)
658	Advanced Weed Science.....	(3)
664	Plant Breeding I.....	(3)
666	Advanced Plant Breeding.....	(3)
676	Quantitative Inheritance in Plant Populations.....	(3)
678	Statistical Genetics.....	(3)
697	Special Topics in Agronomy (Subtitle Required).....	(1-3)

732	Mineral Nutrition of Plants.....	(3)
734	Physiology of Growth and Development.....	(3)
736	Phylogeny of Cultivated Plants.....	(3)
749	Dissertation Research.....	(0)
768	Residence Credit for the Master's Degree.....	(1-12)
769	Residence Credit for the Doctor's Degree.....	(0-12)
770	Agronomy Seminar.....	(1)
799	Research in Agronomy.....	(1-4)

Curriculum and Instruction

Graduate Faculty: Professors Ronald Atwood, Virginia Atwood, Harry Barnard, Connie A. Bridge, Leland Smith and Angene Wilson. Associate Professors Gary J. Anglin, Frank Bickel, Linda S. Levstik, Ernest J. Middleton, Phil Nacke, Christine Pappas, J.T. Stevens, George Szekely, and Peter Winograd.

Associate Members: Associate Professor Jane M. Emanuel. Assistant Professors Ivan W. Banks, William S. Bush, George Newell, Lenora Finn Paradis, Lea Jean Perritt and Mary C. Shake.

Joint Appointments: Associate Professors Georgia C. Collins, Donald Hoffman and Bernard Young.

Emeritus Professors: Lyman Ginger and James Moore.

The Department of Curriculum and Instruction offers a wide range of graduate programs leading to the Master of Arts in Education, Master of Science in Education (Plan A or Plan B available), Specialist in Education, and Doctor of Education degrees. These programs are designed to prepare specialists for a variety of roles in curriculum and instruction including teaching, supervising, and coordinating subject matter areas at the elementary, junior high, senior high, and junior college levels. The doctoral programs prepare leaders for public schools, universities and other educational agencies. Specialization is available in several graduate areas.

In cooperation with the Department of Administration and Supervision, the department offers a program leading to the Doctor of Education (Ed.D) degree in Instruction and Administration.

Course work for the Ed.D. in Instruction and Administration will consist of a minimum of 42 graduate credits beyond the master's degree planned by the Major Professor and Advisory Committee based on the student's background, needs and goals. All course work plans will include work in the following:

- a) Instruction and administration
- b) support work in education,
- c) research tool courses (minimum of 9 semester hours required), and
- d) support work outside of education.

For more information regarding the nature and effective date of the proposed program check with the Director of Graduate Studies of the respective department.

MASTER OF ARTS IN EDUCATION (ELEMENTARY EDUCATION OPTION)

For a Master of Arts in Education, a minimum of 12 semester hours of graduate work shall be selected from at least three of the following areas of professional education. Consult the Director of Graduate Studies for specific recommendations within this broad framework. The program qualifies teachers for a Standard Certificate if they have completed the appropriate undergraduate curriculum.

- Area I. Research Methodology.
EDP 522 and EDP 656
 - Area II. The Psychology of Learning.
EDP 548, EDP 610, EDP 611, and EDP 658
 - Area III. Foundation in Education.
EPE 640, EPE 602, EPE 652, EPE 666, and EDC 650
 - Area IV. A seminar in instruction devoted to the Method and Materials of Teaching. A general or specific course in methods and materials may be taken to meet this requirement.
 - Area V. A General Study of Curriculum Development.
EDC 712 and EDC 732
 - Area VI. Advanced Study in Human Growth and Development.
EDP 600 and EDP 601
 - Area VII. Advanced Study in Reading (required unless waived on basis of previous advanced study in reading).
EDC 540, EDC 619, EDC 620, EDC 641 and EDC 642
- Other course requirements, including 12 semester hours outside of education, are met through courses chosen with the adviser's approval.

MASTER OF ARTS IN EDUCATION (EARLY CHILDHOOD EDUCATION)

This is a cooperative degree program offered through the Department of Curriculum and Instruction and Family Studies. The Master of Arts in Education is offered through Curriculum and Instruction; the Master of Science in Family Studies through Home Economics. Admission to either program requires submission of a departmental application, in addition to The Graduate School application. The program requires a minimum of 36 graduate hours, or 30 hours and a thesis. Course work will be selected from the following areas. Consult the Director of Graduate Studies for specific course recommendations within this framework. This program qualifies teachers for a standard certificate if they have completed the appropriate undergraduate curriculum.

Course Requirements

In addition to these required courses, a

minimum of one course from each of the following areas is required: Area I, Area II, Area III and Area VII.

- Area I. Human Development and Learning.
FAM 555, FAM 655, FAM 654, EDP 548, EDP 610, HPR 566, or NFS 591
- Area II. Ethnic and Cultural Diversity.
EDC 550, EDC 650, FAM 604, SOC 526, SOC/EPE 532, EPE 665
- Area III. Research.
FAM 790, EDP 656, EDP 557, EDG 663
- Area IV. Curriculum Development.
EDC 713, EDC 662, FAM 507, EDP 522, EDS 510, EDC 732, EDC 621
- Area V. Administration of Early Childhood Program.
FAM 552, FAM 605
- Area VI. Humanistic Education.
PSY 539, EDC 661, COM 581
- Area VII. Family.
FAM 554, FAM 652, FAM 653, FAM 573, FAM 510
- Area VIII. Professional Development.
SW 505, FAM 606, EDC 724

Other course requirements including 12 semester hours outside of education (for M.A. in Education candidates) or 18 hours in FAM (for M.S. in Education candidates) are met through courses chosen with the adviser's approval.

**MASTER OF ARTS
IN EDUCATION
(SECONDARY EDUCATION OPTION)**

For a Master of Arts in Education, a minimum of 12 semester hours of graduate work shall be selected from at least three of the following areas of professional education. Consult the Director of Graduate Studies for specific recommendations within the broad framework. The program qualifies teachers for a Standard Certificate if they have completed the four-year undergraduate curriculum.

- Area I. Research and Methodology.
EDP 522 and EDP 656
 - Area II. The Psychology of Learning.
EDP 548, EDP 610, EDP 611, and EDP 658
 - Area III. Foundations in Education.
EPE 640, EPE 602, EPE 652, EPE 666, EDC 650
 - Area IV. A seminar in instruction devoted to Methods and Materials of Teaching.
A general or specific methods and materials course may be taken to meet this requirement.
 - Area V. A General Study of Curriculum Development.
EDC 714, EDC 732, EDC 777, and EDC 607
 - Area VI. Advanced Study in Human Growth and Development.
EDP 600 and EDP 601
 - Area VII. Advanced Study in Reading.
EDC 540, EDC 643, EDC 646, EDC 619, and EDC 620
- Other course work, including 12 semester

hours outside of education, is chosen with the adviser's approval.

**MASTER OF SCIENCE
IN EDUCATION
(SECONDARY EDUCATION OPTION)**

The general requirements for the Master of Science in Education, secondary education area, are the same as those for the Master of Arts in Education. However, the Master of Science in Education may be granted only to those students whose work outside the College of Education includes at least 12 semester hours in mathematics and/or science.

**MASTER OF ARTS IN EDUCATION
AND MASTER OF SCIENCE
IN EDUCATION
(INITIAL CERTIFICATION OPTION—
SECONDARY EDUCATION)**

This program is designed for students having a bachelor's degree in selected subject areas. Students may meet state certification requirements while completing degree requirements. A minimum of twelve semester hours of graduate work must be completed outside the College of Education in the teaching specialty area. Dependent upon the student's background, one may need to complete undergraduate deficiencies to meet degree and certification requirements. Consult the Director of Graduate Studies for specific information regarding degree requirements.

**MASTER OF SCIENCE
IN EDUCATION
(CLINICAL AND
COLLEGE TEACHING OPTION)**

The clinical and college teaching area is a 36-semester hour program designed for individuals who are not seeking certification but wish to develop their instructional knowledge and curricular development skills in order to maximize the acquisition of knowledge and competencies of students outside K-12 school settings. Persons choosing this area are frequently preparing for instructional responsibilities in health-related clinical situations or junior colleges.

Nine of the 18 hours required in education must be taken in the Department of Curriculum and Instruction. At least 12 hours must be taken outside the College of Education. Specific programs are planned with the approval of the Director of Graduate Studies.

**MASTER OF ARTS
IN EDUCATION
(READING)**

Requirements for a Master of Arts in

Education with Reading as an area of concentration must meet the specifications for a Master of Arts in Education, Plan B. The requirements must also be in conformity with the general requirements for the Master of Arts in Education (Elementary) or the Master of Arts in Education (Secondary).

The curriculum shall include a minimum of 33 semester hours of preparation according to the following distribution:

- a. A minimum of 18 semester hours credit in graduate level reading courses to include EDC 619, EDC 620, EDC 642, EDC 641 or 643. An additional 6 hours to be selected with the approval of an adviser.
- b. Six to nine semester hours credit in the College of Education, selected to extend the humanistic, behavioral, multicultural and research components of the program, based on the student's educational background, with adviser approval.
- c. Six to nine semester hours credit selected from appropriate support areas outside the College of Education, with adviser approval.

Completion of the Master of Arts in Education with Reading as an area of concentration will fulfill the academic requirements for certification as a reading specialist. A minimum of three years of successful classroom teaching is an additional requirement for this certification.

500	Clinical and Laboratory Teaching.....	(3)
501	Teaching Internship.....	(3-12)
511	Special Topics in Early Childhood Education.....	(1-3)
513	Teaching English as a Second Language..	(3)
514	Test Materials and Methods.....	(3)
521	Materials and Methods in Teaching Mathematics in Secondary School.....	(3)
522	Materials and Methods in Teaching Social Studies in the Secondary School.....	(3)
524	Materials and Methods for Teaching Science in the Secondary School.....	(3)
525	Materials and Methods of Teaching English in the Secondary School.....	(3)
533	Teaching Reading in the Secondary School.....	(3)
534	Reading and Study Skills in English.....	(3)
538	Advanced Arts and Crafts in the Elementary School.....	(3)
540	Problems in Teaching Reading.....	(3)
542	Children's Literature.....	(3)
544	Utilization of Educational Media.....	(3)
545	Preparation of Instructional Materials....	(3)
547	Microcomputers in Instruction.....	(3)
549	Social Processes and Effects of Mass Communication.....	(3)
550	Teaching the Culturally Different.....	(3)
552	Modern Educational Problems.....	(3)
565	Modern Educational Problems. (General Curriculum).....	(3)
575	Modern Educational Problems. (Unclassified).....	(3)
576	Modern Educational Problems. (Unclassified).....	(3)
580	Introduction to Gifted Education.....	(3)
600	Workshop in Reading.....	(1-3)
602	Curricula and Programming for the Gifted.....	(3)

606	Instructional Television in the Classroom.....(3)
607	Basic Instructional Design.....(1-3)
608	Applications of Instructional Design.....(3)
610	Discipline and Classroom Management.....(3)
618	Advanced Study in the Teaching of Reading.....(3)
619	Assessment of Reading Growth and Development.....(3)
620	Design and Implementation of Reading Instruction.....(3)
621	Linguistic and Cognitive Foundations of Reading in Early Childhood.....(3)
641	Research and Theory in Teaching Reading in the Elementary School.....(3)
642	Research and Theory in Teaching Language Arts in the Elementary School.....(3)
643	Research and Theory in Teaching Reading in Secondary Schools.....(3)
646	Organizing Reading Programs.....(3)
661	Affective Curriculum Strategies.....(3)
662	Integrating Learning Experiences in Early Childhood Education.....(2)
670	Advanced Study in the Teachings of Elementary School Mathematics.....(3)
676	Practicum in Gifted Education.....(3)
710	Advanced Topics in Instructional Design.....(3)
712	The Elementary School.....(3)
713	Curriculum Trends in Early Childhood Education.....(3)
714	The Secondary School.....(3)
724	Organization and Supervision of Student Teaching.....(3)
730	Problems of the School Curriculum.....(3)
732	Principles of Curriculum Construction.....(3)
740	Practicum in Teaching Reading and Related Language Arts.....(3)
746	Motion Pictures in Education.....(3)
747	Seminar in Reading and Language.....(3)
748	Psychology of Reading and Language.....(3)
749	Dissertation Research.....(0)
757	College and Adult Reading.....(3)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
777	Seminar in Curriculum and Instruction (Subtitle Required).....(1-3)
781	Independent Study in Curriculum and Instruction.....(1-3)
791	Research Problems in Curriculum and Instruction.....(1-3)

Dentistry

Graduate Faculty: Professors Emmett Costich, Raymond Kopczyk, Jan Kraal, Harold Laswell, James Matheny, Jeffrey P. Okeson, Gerald Roth and Stanley Saxe. Associate Professors Herbert Abrams, E. Preston Hicks, Samuel J. Jasper, and Richard J. Mitchell.
Associate Member: Assistant Professor Jesse Burton Douglas.

The program leading to the Master of Science in Dentistry degree is designed to provide the graduate dentist with clinical proficiency in a specialty area, research experience in a basic biological discipline, and exposure to the fundamentals of teaching in the field of dentistry. At the present time, students pursuing specialty training in the

areas of orthodontics and periodontics are eligible for the Master of Science in Dentistry degree.

Only dental graduates of high academic standing will be accepted into this program, which requires two years of clinical training, integrated with additional basic science and research experience. The first year is largely devoted to basic scientific topics, clinical training, and theory. The second and later years will be a continuation of clinical training, with a high proportion of time devoted to basic science studies, research, and dental teaching techniques.

The program is interdisciplinary in scope and is taught by systems rather than the classic strict subject approach. The participating faculty is from all the clinical departments of the College of Dentistry, from the Medical Center Departments of Anatomy, Pediatrics, Psychiatry and Behavioral Science, and from University Hospital.

Specific requirements for the Master of Science in Dentistry degree are: (1) satisfactory completion of the clinical certificate program; (2) 30 hours graduate credit, at least half of which must be basic science (non-clinical) courses; (3) submission of an acceptable thesis based on an individual research project (Plan A) and (4) passage of a comprehensive oral examination and thesis defense. Foreign language credit is not required.

ORT 610	Cranio-Facial Form.....(3)
ORT 620	Oral-Pharyngeal Function, Part I.....(2)
ORT 621	Oral-Pharyngeal Function, Part II.....(2)
ORT 660	Orthodontic Diagnosis.....(1)
ORT 661	Orthodontic Seminar-Clinic.....(3)
ORT 662	Orthodontic Technique.....(3)
ORT 664	Biomechanics.....(1)
ORT 700	Orthodontic Seminar.....(1)
ORT 710	Management of Complex Orofacial Deformities.....(1)
ORT 750	Research in Orthodontics.....(1-5)
ORT 768	Residence Credit for Master's Degree.....(1-6)
CDS 550	Research Methodology and Instrumentation.....(2)
CDS 611	Child Growth and Development, Part I.....(2)
CDS 612	Child Growth and Development, Part II.....(2)
CDS 631	Principles of Dental Occlusion.....(2)
CDE 655	Health Care Organization.....(1)
OBI 650	Oral Biology for Postdoctoral Dental Students.....(4)
OPT 651	Graduate Oral Pathology.....(3)
OSG 651	Anatomical Relationships in Surgery.....(1)
PER 610	Introduction to Geriatric/Gerontologic Health Care.....(1)
PER 626	Advanced Concepts in General Dentistry.....(1)
PER 661	Modern Concepts in Periodontics.....(2)
PER 768	Residence Credit for the Master's Degree.....(1-6)

PER 770	Treatment Planning Seminar.....(2)
PER 772	Periodontal Biology and Pathology.....(2)
PER 774	Periodontics Surgical Seminar.....(1)
PER 776	Periodontal Therapy Seminar.....(1)
PER 790	Research in Periodontics.....(1-3)
PDO 631	Dental Care for the Chronically Ill and Handicapped Child.....(2)
CPC 501	Perspectives in Religion and Health.....(3)

Diplomacy and International Commerce

Graduate Faculty: Professors Vincent Davis and John D. Stempel.

Emeritus Professor: Amry Vandenbosch.

The Patterson School of Diplomacy and International Commerce offers an interdisciplinary master's degree and serves in an advisory capacity with respect to the Ph.D. programs in international studies within the four departments primarily related to the Patterson School. The primary departments are Business Administration, Economics, History and Political Science.

The M.A. degree program can be tailored with considerable flexibility to meet the career needs of any particular student. Plan A and Plan B are available. This program is especially useful for the student desiring a career in any of the non-academic fields in foreign affairs, such as international banking, international business, international journalism (foreign correspondent), or service with governmental agencies (such as the U.S. Department of State) or international organizations (such as the United Nations) in foreign affairs.

At least half of the 30 minimum hours for the M.A. degree must ordinarily be in one of the four primary departments. Each student is expected, in the absence of special circumstances, to take a methodology course such as accounting, statistics or computer science at the graduate level. Most students can expect to complete the 30 minimum hours for the M.A. degree in one full school year (12 hours in each of two semesters) plus a summer session, or plus the following (third) semester if more than the 30 minimum hours are desired.

To assure the interdisciplinary character of the degree, the M.A. candidate is expected to take 12 to 15 hours distributed in at least two departments outside the major departmental concentration. Courses acceptable to the program include those dealing with interstate and cultural relations, foreign policy, and national and regional development processes. Enough flexibility is allowed so that a student may concentrate the work in a specific geographical area such as

Latin America, Asia, Europe, etc., or prepare more broadly in certain topical or functional aspects of international affairs.

The student must pass a written and an oral examination covering work in three subfields of study, with these subfields to be defined for any particular student and in consultation with the student by the Patterson School Director of Graduate Studies.

The Patterson School M.A. candidate must meet the basic Graduate School requirement for a reading knowledge of a modern foreign language.

The M.A. degree offered by the Patterson School matches up well with other graduate and professional programs such as a law degree, for those students who might desire extended postgraduate career preparation. However, the Patterson School M.A. degree does not match up well with a doctoral degree. Students who contemplate obtaining a Ph.D. are advised to proceed directly toward that goal.

A number of non-service Patterson School fellowships are available from the income from the bequest of James K. Patterson, the first President of the University.

Application forms for admission and for fellowship assistance should be requested from the Dean of The Graduate School and returned to the Dean of The Graduate School.

It is useful if advance carbon copies or photocopies of all such application materials can be sent directly to the Director of the Patterson School (Patterson Office Tower, University of Kentucky). The Director of the Patterson School wishes all applicants to note that GRE scores and official transcripts from each college or university attended are required by The Graduate School as part of the application procedure. In addition, each applicant is required to submit a brief statement (two or three pages, at most) explaining the special interest in the Patterson School program in terms of career goals. Each applicant is also requested to have three academic letters of reference and three letters of character or employment reference to be mailed directly to the Director of the Patterson School.

768	Residence Credit for the Master's Degree.....	(1-6)
777	Research Problems in International Relations.....	(3)
795	Special Problems in Diplomacy and International Commerce.....	(3)

Economics

Graduate Faculty: Professors M.M. Ali, Glenn C. Blomquist, Virgil Christian, Richard Gift, Curtis Harvey, Charles Hultman, Joseph Krislov, G.S.

Laumas, Don Soule, William Stober and Robert Stroup. Associate Professors Mark Berger, Dan Black, James Fackler, John Garen, Richard Jensen, John Madden, David Ross, Frank Scott, and Michael Webb. Extension Professor Randolph McGee.

Associate Members: Assistant Professor Steven Holland.

Joint Appointment: Associate Professor Eugenia Toma.

Emeritus Professors: Carl Cabe, Cecil Carpenter, Carl C. Erwin, H.W. Hargreaves, James W. Martin, Walter Pearce and William Tolman.

MASTER OF SCIENCE

Objectives

The M.S. in Economics is primarily for students who wish to have flexibility in a program of advanced study in economics. This degree program provides minimal preparation for employment as an undergraduate teacher of economics and as a researcher for government, business, and other organizations. The program can be structured to prepare a student for further graduate work in economics, but it is also highly suitable for students with strong interdisciplinary interests. The program can be structured to prepare a student for further graduate work in economics and related fields. Plan B is offered.

Requirements

Recommended minimal undergraduate preparation: six hours of intermediate theory, six hours of statistics, and six hours of calculus. These can be taken in the program as additional work.

Requirements for the M.S. in economics are:

1. A minimum of 30 hours of graduate credit courses.
 - a. Fifteen hours must be in courses in the Department of Economics, and 12 of these hours must be in courses reserved exclusively for graduate students.
 - b. At least 15 hours of the total of 30 must be in courses reserved exclusively for graduate students.
 - c. The 30 hours must include ECO 660 or 760 and ECO 661 or 761, Economic Theory.
2. Success in a final examination.
3. Minimal average of grade B in all courses attempted for graduate credit after being admitted to Graduate School. Students obtaining six quality points below a B average will be dropped by the department.

MASTER OF ARTS

Objectives

The Master of Arts (M.A.) in Economics is the first stage of the Ph.D. program. The M.A. in Economics provides preparation for employment in colleges, and in government,

business and other organizations. The program is designed to provide advanced study in:

1. Economic theory.
2. Quantitative techniques and research skills, and
3. A specialization within economics.

Recommended minimal undergraduate preparation—six hours of intermediate level economic theory and six hours of differential and integral calculus.

Requirements

1. A minimum of 30 hours of graduate credit courses, including:
 - ECO 760 Neoclassical Microeconomic Theory
 - ECO 762 General Equilibrium Analysis and Welfare Economics
 - ECO 761 Advanced Macroeconomic Theory
 - ECO 763 Seminar in Macroeconomic Theory
 - STA 424 Probability and Distribution Theory
 - ECO 691 Introduction to Econometrics I
 - ECO 692 Introduction to Econometrics II.
 Two courses in an elective area of the Ph.D. Program
2. Successful examination in one modern foreign language.
3. Minimal average of Grade B in all courses attempted for graduate credit after being admitted to The Graduate School. Students obtaining six quality points below a B average will be dropped by the department.
4. Success in a final examination.

THE PH.D. DEGREE

Objectives

The Ph.D. program is designed to enable the graduate to contribute to the advancement of economics. The program is also aimed at producing graduates who are qualified to teach, as well as engage in industrial and governmental research and consulting.

To attain these objectives, the program is designed to provide the student with the appropriate knowledge, understanding, skills and abilities, including:

1. An understanding of economic theory.
2. Skill in the use of quantitative techniques, specifically mathematics and statistics.
3. Specialization in a limited number of areas.
4. A knowledge of the broad social and political background of the economic environment.
5. Experience in the development of research projects throughout their entire program.
6. Research and writing skills that would lead to the publication of original research.

7. Competence in communicating economic knowledge to broad and diverse audiences.
8. Recommended minimal undergraduate preparation: six hours of intermediate economic theory, six hours of statistics, and six hours of calculus.

Requirements

Work for the degree of Doctor of Philosophy in Economics must conform to the general requirements of The Graduate School. The requirements for the degree are:

1. Economic Theory. The student must demonstrate competence in economic theory as demonstrated by passing a departmental written examination in economic theory. This examination will be given twice a year, at the beginning of the fall and spring semesters. Students failing the examination will be given a second attempt; those failing on the second attempt will be dropped from the program.
Minimal preparation for the written examination in economic theory can be achieved by taking the following core courses:
ECO 660 Advanced Microeconomic Theory
ECO 661 Macroeconomic Theory
ECO 761 Advanced Macroeconomic Theory
Performance in these courses may be taken into account in evaluating the written examination in economic theory in that exceptional performance in the course may compensate for marginal performance in the examination.
In addition the student must satisfactorily complete ECO 762 and ECO 763.
2. Statistics/Econometrics. The student must demonstrate competence in the area of statistics and econometrics. This competence may be demonstrated by satisfactory performance in the following courses:
STA 424 Probability and Distribution Theory
ECO 691 Introduction to Econometrics I
ECO 692 Introduction to Econometrics II
or by passing a special examination.
3. Elective Areas. All Ph.D. students must choose two fields of study approved by the student's Advisory Committee. These fields include, but are not limited to, the following: econometrics, international economics, monetary economics, labor economics, economic development and public, urban and regional economics. What constitutes minimum course preparation in each field shall be determined by the student's Advisory Committee.
The student may also take elective areas in other disciplines, including Agricultural Economics, Finance, Marketing, Management, and Mathematics, or in any discipline approved by his/her advisory committee.
4. Supporting Work. At least 15 hours of supporting course work must be selected. These courses must be approved by the student's Advisory Committee. This supporting work will provide an opportunity for mastery of

- the foundations of economics, and will ordinarily include ECO 662-Research Methods and Procedures in Economics and ECO 665-History of Economic Thought I.
5. Foreign language. The candidate must satisfy The Graduate School language requirement for one modern foreign language.
 6. Grades. Minimal average of grade B in all courses attempted for graduate credit after being admitted to The Graduate School. Students obtaining six quality points below a B average will automatically be dropped by the department.
 7. Qualifying Examinations.
 - a. Written examinations: Written examinations must be taken in the student's field, as part of the requirements for candidacy for the Ph.D. degree. These examinations are given twice a year, at the beginning of the fall and spring semesters, and are scheduled by the student's Advisory Committee. The written examinations will be prepared and graded by faculty members who are specialists in the fields.
 - b. Oral Examinations: After passing the written qualifying examinations, the student will be given an oral examination by the Advisory Committee. This oral examination will be concerned with the student's competence in the fields.
 8. Dissertation Proposal. In the semester after the candidate passes the qualifying examinations, ECO 797 must be taken for 3 credit hours. This course will be directed by the chairman of the Advisory Committee and will consist of independent study and reading in one of the candidate's fields. As part of the requirements for this course, the student will write a dissertation proposal and present it at a faculty seminar.
 9. Internship. The department will require of all candidates an internship. This internship will usually consist of teaching (3-6 semester hours), though upon approval of the Director of Graduate Studies, the student may select some other activity appropriate to his professional expectations.
 10. The Ph.D. Dissertation. The dissertation will be based on original research on a significant topic. The dissertation will be defended in an oral examination.

461G	Market Structure and Anti-trust Policy.....	(3)
463G	Analysis of Business Conditions.....	(3)
464G	Economics of Regulated Industries.....	(3)
465G	Comparative Economic Systems.....	(3)
467G	American Economic History Economist View.....	(3)
469G	History of Economic Thought.....	(3)
470G	International Economic Policy.....	(3)
471G	International Economics.....	(3)
473G	Economic Development.....	(3)
475G	The Latin America Economics.....	(3)
477G	Labor Economics.....	(3)
479G	Public Finance.....	(3)
481G	Collective Bargaining.....	(3)
483G	Regional Economics.....	(3)

485G	Monetary Economics.....	(3)
487G	Intermediate Macroeconomic Theory.....	(3)
488G	Intermediate Microeconomic Theory.....	(3)
492G	Economic Modeling and Data Analysis.....	(3)
493G	Social and Cultural Determinants of Economic Growth and Development.....	(3)
494G	Economics of Energy Production and Distribution.....	(3)
590	Introduction to Quantitative Economics I.....	(3)
610	Managerial Economics.....	(3)
611	Business Conditions Analysis.....	(3)
626	Time Series Analysis.....	(3)
636	Health Economics.....	(3)
652	Public Policy II: Economic Analysis.....	(3)
660	Advanced Microeconomic Theory.....	(3)
661	Macroeconomic Theory.....	(3)
662	Research Methods and Procedures in Economics.....	(3)
665	History of Economic Thought I.....	(3)
666	History of Economic Thought II.....	(3)
670	Economics of International Financial Institutions.....	(3)
671	International Economics Seminar I.....	(3)
673	Seminar in Economic Development I.....	(3)
674	Agriculture and Economic Development.....	(3)
676	Labor Markets and Wage Determination.....	(3)
679	Seminar in Public Economics I.....	(3)
683	Economics of Growth and Development in Regions and Urban Areas.....	(3)
684	Environmental Economics, Regulation and Policy.....	(3)
686	Monetary Economics: Theory.....	(3)
687	Monetary Economics: Policy.....	(3)
688	Optimization and Economic Theory.....	(3)
691	Introduction to Econometrics I.....	(3)
692	Introduction to Econometrics II.....	(3)
749	Dissertation Research.....	(0)
760	Neoclassical Microeconomic Theory.....	(3)
761	Advanced Macroeconomic Theory.....	(3)
762	General Equilibrium Analysis and Welfare Economics.....	(3)
763	Seminar in Macroeconomic Theory.....	(3)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
771	International Economics Seminar II.....	(3)
773	Seminar in Economic Development II.....	(3)
776	Economics of Trade Unionism and Labor Law.....	(3)
779	Seminar in Public Economics II.....	(3)
786	Seminar in Monetary Theory and Policy.....	(3)
788	Mathematical Economics.....	(3)
791	Problems in Econometrics.....	(3)
792	Econometrics I.....	(3)
793	Econometrics II.....	(3)
796	Seminar.....	(1-6)
797	Research Problems in Economics.....	(1-6)

Education and Counseling Psychology

Graduate Faculty: Professors James Barclay, Henry Cole, Gordon Liddle, Emanuel Mason, Timothy Smith, William Stilwell and Judith Worell. Associate Professors Dwight Auvenshine, Fred Danner, Stephen DeMers, Pamela Remer and Rory Remer.

Associate Members: Professor Lane J. Veltkamp. Associate Professor Raymond Wilkie. Assistant Professor Polly Peterson. Adjunct Assistant Professor Michael Nichols.

Joint Appointments: Professor Lisa Barclay, Associate Professors Charlotte R. Clark and Ralph M. Crystal, Assistant Professor Reginal Alston.

Emeritus Professor: Harriet Rose.

The Department of Educational and Counseling Psychology offers programs leading to the following degrees: Master of Arts in Education, Master of Science in Education (Plans A and B available), the Specialist in Education (Ed.S.), the Doctor of Education (Ed.D.), and the Doctor of Philosophy (Ph.D.). Students must apply to both The Graduate School and to the department. Doctoral applications must be completed by January 15 for summer/fall beginning. All other degree applications are considered shortly after March 1.

Within the degree programs there are a number of specializations possible (e.g., counseling psychology, educational psychology and school psychology). Specializations are designed to provide students with both a background in behavioral and humanistic components of human learning and behavior, and competencies to practice the skills designated for these programs. Admission to candidacy in any of these programs includes not only demonstrated skills in the academic area, but a judgment by the faculty of the area program that the candidate demonstrates the personal and social characteristics as well as the professional commitment and ethical standards requisite for providing the skills associated with the program and the advanced degree.

For further information on specific program guidelines, contact the Director of Graduate Studies in the Department of Educational and Counseling Psychology.

**MASTER OF ARTS
IN EDUCATION DEGREE
(GUIDANCE AND COUNSELING)**

Two areas of concentration are open to candidates interested in this degree program. They are: concentration in elementary guidance and counseling, and concentration in secondary guidance and counseling. The programs in elementary and secondary guidance and counseling are designed to prepare individuals with a teaching certificate for guidance and counseling functions in public schools.

Ordinarily, applicants for these programs will have a regular teaching certificate at the elementary or secondary level, and one year of teaching experience. Applicants lacking these qualifications who wish to obtain the degree and be certified for school work must complete the teacher education program, earn appropriate certification, and complete one year of teaching at the appropriate

school level. The curriculum for these programs matches the state guidelines in the areas of elementary and secondary counseling. These programs provide learning experiences in each of the required competency areas. The program prerequisites include psychological tests and abnormal psychology. The programs vary from 36 to 39 graduate hours.

**MASTER OF SCIENCE
IN EDUCATION DEGREE**

The Master of Science in Education degree is offered by the department for individuals who will not meet state certification requirements in counseling or school psychology immediately upon completion. The work completed for this degree is applicable toward certification in either counseling or school psychology, but does not fulfill state certification requirements. Individuals who are interested in specializing in educational psychology, human development, measurement, or research in education may obtain this degree. The educational psychology program, planned in consultation with an adviser, is flexible and tailored to individual needs. It consists of 36 hours of graduate work without a thesis or 30 hours with a thesis. The counseling program prerequisites include psychological testing and abnormal psychology. There is also a 60-hour program including the Master of Science in Education degree program plus a full-time one-semester internship and additional course work. This program leads to permission to sit for the State Board of Psychology Certification Examination in Counseling Psychology. The requirements for the State Board of Education certification in School Psychology include the work for the Master of Science in Education Degree plus the additional Educational Specialist degree requirements.

**DOCTOR OF EDUCATION
DEGREE**

The Doctor of Education degree is offered in the areas of educational and of school psychology. Programs in this department follow the general guidelines of the College of Education program as specified earlier. (See Graduate School section of Bulletin.)

**DOCTOR OF PHILOSOPHY
DEGREE**

The Ph.D. program is offered in the specialty areas of counseling psychology, educational psychology and school psychology under one departmental program. The Counseling Psychology Ph.D. program

is fully accredited by the American Psychological Association, while the School Psychology (Ph.D. or Ed.D.) program is provisionally accredited by APA. A full-time, supervised one-year internship is required for all areas.

There are various concentrations possible within the Ph.D. program. Representative of these are: (1) learning, cognition, and curriculum design; (2) human development and social processes; (3) counseling psychology; (4) measurement, evaluation and research design; and (5) school psychology.

(See The Graduate School section of the Bulletin.)

518	Mental Hygiene.....	(3)
520	The Secondary School Pupil.....	(3)
522	Educational Tests and Measurements.....	(3)
548	Educational Psychology.....	(3)
557	Educational Statistics.....	(3)
570	Introduction to Psychological Services in Schools.....	(3)
580	Introduction to Gifted Education.....	(3)
600	Life Span Human Development and Behavior.....	(3)
601	Human Social Development.....	(3)
603	Human Cognitive Development.....	(3)
604	Development of Psychological Sex Roles.....	(3)
605	Introduction to Counseling.....	(3)
606	Professional Issues in Counseling Psychology.....	(3)
610	Theories of Learning in Education.....	(3)
611	Human Cognitive Learning.....	(3)
612	Development of Creativity and Critical Thinking.....	(3)
620	Topics and Methods of Evaluation.....	(3)
621	Advanced Topics and Methods of Evaluation.....	(3)
640	Individual Assessment of Cognitive Functioning.....	(3)
641	Psychological Measuring Instruments.....	(3)
649	Group Counseling.....	(3)
650	Diagnosis and Counseling in Counseling Psychology.....	(3)
652	Theories of Counseling.....	(3)
653	Psychological Appraisal of Children and Youth.....	(3)
656	Methodology of Educational Research.....	(3)
658	Problems in Educational Psychology.....	(1-3)
659	Advanced Educational Measurement.....	(3)
660	Research Design and Analysis in Education.....	(3)
661	Techniques of Counseling.....	(3)
665	Practicum in Counseling Psychology....	(3-6)
666	Psychology of Career Counseling.....	(3)
669	Identifying and Providing for Individual Student Needs.....	(3)
669	Diagnostic Classification in School Psychology.....	(3)
670	Psychoeducational Strategies of Intervention.....	(3)
671	Seminar in Psychoeducational Consultation in Schools.....	(3)
675	Practicum in School Psychology.....	(3-6)
676	Practicum in Gifted Education.....	(3)
677	Advanced Studies in Community Mental Health.....	(3)
680	Parent and Child Counseling.....	(3)
683	Topics in Counseling Psychology.....	(1-3)

685	Issues and Techniques in the Counseling of Women.....(3)
686	Theory and Methods in Marriage and Family Counseling.....(3)
690	Advanced Studies in Psychological Assessment.....(3-6)
701	Behavioral Counseling.....(3)
702	Career Development: Research, Theories and Practices.....(2-3)
703	Seminar in Clinical Supervision.....(1-3)
707	Multivariate Analysis in Educational Research.....(3)
708	Internship in Educational Psychology and Counseling.....(3-9)
748	Psychology of Reading and Language.....(3)
749	Dissertation Research.....(0)
762	Organization and Operation of Pupil Services.....(3)
763	Research and Evaluation in Guidance.....(3)
765	Independent Study in Counseling Psychology.....(1-4)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
777	Seminar in Counseling Psychology.....(1-3)
778	Seminar in Educational Psychology.....(3)
782	Independent Study in Educational Psychology.....(1-4)

Educational Policy Studies and Evaluation

Full Faculty: Professors Leonard L. Baird, David E. Denton, Charles F. Elton, Thomas R. Guskey and Edward W. Kifer. Associate Professors Richard M. Angelo, Clinton Collins, Alan J. Deyoung, Richard T. LaBrecque, and Edgar L. Sagan.

Associate Members: Assistant Professor Beth Leah Goldstein. Adjunct Professor Donald Gehring. Adjunct Associate Professor Jon S. Hesselden.

The Department of Educational Policy Studies and Evaluation provides a unique opportunity for students who wish to develop the knowledge, judgment, and research skill required to address educational issues with flexibility and imagination. Although methodological finesse is prized within the department, degree programs do not emphasize 'methods' per se. The premium is placed on understanding questions of policy within the broader, often overlapping contexts in which they arise. Every effort is made to face the issues in ways which credit rather than ignore those contexts and their subtlety.

There are four broad areas of concentration. Higher Education focuses upon research concerning higher education policies, programs, and services. History and Philosophy of Education treats educational issues, problems, ideas, and institutions, using the tools of historical inquiry and philosophical analysis. The Socio-Cultural Study of Education provides sociological, anthropological, and comparative/international perspectives. Evaluation focuses upon the

relationships among ethics and education, policy analysis, and the development of evaluation systems for educational policies and programs.

The department's faculty represents a wide spectrum of intellectual orientations, professional commitments, and experience. No less importantly, an uncommon degree of respect for both the difficulties and the necessities of interdisciplinary conversation prevails. These factors, together with substantial flexibility in program planning at the course work stage (which includes opportunities for independent study, affiliations with faculty from other departments in the College and the University, as well as extramural internships), help to create an environment congenial to students with a variety of backgrounds and future goals. Some of the department's graduates pursue traditional academic careers as faculty members or administrators. Others serve as policy analysts or evaluation specialists in school systems, state departments of education, or in other arenas outside the university.

DEGREE PROGRAMS

Master of Science in Education (MS in Education)

The master's degree is available for those who wish to explore topics in educational policy and evaluation for the first time, or to enhance what understanding they may already possess through direct experience as a teacher or as a member of an administrative staff. For some it serves as a terminal degree; others use it to lay the foundation for doctoral study.

Admission requires a minimum grade point average of 2.5 in all undergraduate course work, a 3.0 GPA for any previous graduate work, as well as satisfactory completion of the Graduate Record Examination. A total of 31 credit hours are required to complete the degree—full-time study for one academic year or its equivalent. No less than 19 hours of the total required must be taken within Educational Policy Studies. Planning in conjunction with an advisory committee, students choose a suitable array of courses from among the department's four areas of concentration, and then round out their programs with some appropriate support work from other departments within the College or the University.

Doctor of Education (Ed.D.)

The Ed.D. program in Educational Policy Studies and Evaluation provides advanced study for those who seek careers in the administration or evaluation of educational

programs in schools, colleges, or other institutional settings. The program is also ideally suited for those who wish to develop the scholarly competence needed to serve as faculty members in colleges of education.

Admission to the program requires a master's degree (or thirty graduate credits applicable to an appropriate master's degree) and satisfactory completion of the Graduate Record Examination. Course work is planned by the student's advisory committee based on their assessment of his or her background and goals. All programs include course work chosen from the department's four general areas of concentration as well as support work in related fields within or outside the College of Education. Although some students' programs may require competency in a foreign language, there is no general foreign language requirement.

Doctor of Philosophy (Ph.D.) Studies in Higher Education

The University requires candidates for the Ph.D. to demonstrate competency in a foreign language. Apart from this institution-wide requirement, the degree of Doctor of Philosophy represents the same level of attainment as the Doctor of Education. Graduate students are held to a uniformly high standard of intellectual accomplishment at both the course work stage and the dissertation, no matter what degree option they may pursue. Unlike the Ed.D. program, however, where students are free to choose an area of concentration, the department's Ph.D. requires intensive research on some aspect of higher education. The student works through a mandatory core of courses and then selects an area of concentration in either the history and philosophy of higher education, or research and evaluation in higher education. The requirements for admission are a minimum of 24 hours of graduate work (a master's degree in a discipline outside of Education is preferred), satisfactory scores on the Graduate Record Examination, and successful interviews with members of an admissions committee.

Joint Doctoral Program

The department participates in the joint doctoral program with other regional universities. These programs permit qualified applicants to complete approximately one year of graduate study beyond the master's degree at the regional institution. The remainder of the academic program must be completed at the University of Kentucky. The work of each student is directed by a joint faculty committee from the two institutions.

532 Race and Ethnic Relations.....(3)

533	Introduction to the Philosophic Study of Education.....(3)
555	Comparative Education.....(3)
601	Proseminar.....(3)
602	Social Policy Issues and Education.....(3)
603	Educational Policy Analysis: An Introduction.....(3)
620	Topics and Methods of Evaluation.....(3)
621	Advanced Topics and Methods of Evaluation.....(3)
623	Action Research.....(3)
628	Ethics and Educational Decision-Making.....(3)
629	Futuristics and Educational Policy.....(3)
640	Philosophy of Education.....(3)
642	Knowledge, Ideology and Schooling.....(3)
643	Values, Moral Education and Schooling.....(3)
646	Analysis of Thinking.....(3)
650	History of Western Education.....(3)
652	History of Educational Thought.....(3)
653	History of Higher Education.....(3)
661	Sociology of Education.....(3)
662	Analysis of Educational Change.....(3)
663	Field Studies in Educational Institutions.....(3)
665	Education and Culture.....(3)
666	Multi-Cultural & International Education.....(3)
670	Policy Issues in Higher Education.....(3)
672	College Teaching and Learning.....(3)
674	Theories of Student Development.....(3)
676	Organization and Administration of Higher Education.....(3)
678	Economics of Higher Education.....(3)
680	Politics of Higher Education.....(3)
749	Dissertation Research.....(3)
750	Problems in Sociology of Education.....(3)
768	Residence Credit for the Master's Degree.....(3)
773	Seminar in Educational Policy Studies and Evaluation.....(1-3)
778	Seminar in History of Education in Kentucky.....(3)
785	Independent Studies in Education Policy and Evaluation.....(3)
790	Internship in Educational Policy Studies and Evaluation.....(6)
799	Research Problems in Higher Education.....(3)

Electrical Engineering

Graduate Faculty: Professors Eugene Bradley, Prasad Kadaba, Tsu-Tiar Lee, Benjamin J. Leon, Syed Nasar, Clayton Paul, Earl Steele and Frederick Trutt. Associate Professors Jimmie J. Cathey, Raymond Distler, and James R. Heath.

Associate Members: Assistant Professors Anders H. Anderson, Tae-Sang Chung, William R. Grise, Hassan A. Hejase, Krishna Naishadham, Sam S. Pyo and Bruce L. Walcott.

Joint Appointment: Associate Professor Pramode K. Bhagat.

The Department of Electrical Engineering offers advanced studies leading to either a Master of Science in Electrical Engineering or a Doctor of Philosophy in Electrical Engineering. A minimum grade point average of 3.0/4.0 on all undergraduate work is

required for admission to the graduate program. A minimum GRE general test score of 1000 (combination of verbal and quantitative sections) must be obtained. An undergraduate degree in electrical engineering is preferred. Those applicants without a BSEE from an ABET accredited EE program should develop competence and demonstrate ability in the fundamentals of electrical engineering. Such students before being admitted to full graduate standing within the department must either take (or have taken an equivalent of) a set of prescribed electrical engineering remedial courses. A minimum grade of C must be made in these courses.

For the MSEE degree, both the thesis and non-thesis options are available. The thesis option requires 24 hours of acceptable graduate level work plus the satisfying of the usual requirements for the thesis. The non-thesis option, Plan B, requires 30 hours of acceptable graduate work plus an additional three hours of EE783, the special problems project. All students in their first semester of regular graduate work must select an academic adviser who will assist the student in formulating a graduate plan of study leading to their particular degree. This plan, which must receive the approval of the Director of Graduate Studies, must contain specific courses and a proposed thesis area or specialized project topic.

In order to assure a minimum breadth and level of understanding at the graduate level, all EE graduate students must take three of five specified courses from the major areas of electrical engineering. These courses are: EE611 — Stochastic Systems, EE621 — Electromagnetic Systems, EE640 — Stochastic Systems, EE661 — Solid State Electronics, EE685 — Digital Computer Structure. Although no formal course requirements exist for the Ph.D. program, students must satisfy the above mentioned core course requirements as well as the selection of an adviser and the formulation of the graduate plan of study.

The Department of Electrical Engineering has active research programs in the following areas: electric machines and drives, power electronics, computer engineering, power systems, robotics, control systems, electromagnetic compatibility, electromagnetic field theory, microelectronics, analog and digital signal processing, communication systems, circuit theory, quantum electronics, laser Raman spectroscopy, and biomedical engineering. Departmental laboratories are well-equipped for students' research. In addition, the Center for Robotics and Manufacturing Systems at the University of Kentucky pro-

vides additional research opportunities in the area of robotics.

402G	Electronic Instrumentation and Measurements.....(3)
403G	Advanced Electrical Engineering Laboratory I.....(2)
415G	Electromechanics I.....(3)
416G	Electrical Engineering Laboratory III.....(2)
420G	Electrical Engineering Analysis I.....(3)
461G	Introduction to Electronics.....(3)
462G	Electrical Engineering Laboratory II.....(2)
467G	Electric and Magnetic Fields.....(3)
468G	Fields and Waves.....(3)
471G	Linear Feedback Control Systems.....(3)
480G	Logical Design.....(3)
511	Introduction to Communication Systems.....(3)
512	Digital Communication Systems.....(3)
517	Advanced Electromechanics.....(3)
522	Antenna Design.....(3)
523	Microwave Circuit Design.....(3)
527	Electromagnetic Compatibility.....(3)
530	Robotics.....(3)
537	Electric Power Systems I.....(3)
538	Electric Power Systems II.....(3)
560	Semiconductor Device Design.....(3)
561	Electric and Magnetic Properties of Materials.....(3)
562	Electronic Circuits II.....(3)
562	Analog Electronic Circuits.....(3)
564	Digital Electronic Circuits.....(3)
567	Introduction to Lasers and Masers.....(3)
581	Advanced Logical Design.....(3)
583	Microprocessors.....(3)
584	Computer Aided Design.....(3)
587	Microcomputer Systems Design.....(3)
595	Independent Problems.....(1-3)
599	Topics in Electrical Engineering.....(2-3)
601	Electromagnetic Energy Conversion I.....(3)
602	Electromagnetic Energy Conversion II.....(3)
603	Power Electronics.....(3)
611	Linear Systems Analysis.....(3)
613	Optimal Control Theory.....(3)
614	Sampled-Data Control Systems.....(3)
619	Problems Seminar in Operations Research.....(3)
622	Advanced Electrodynamics.....(3)
623	Field Theory of Guided Waves.....(3)
627	Multiconductor Transmission Lines.....(3)
629	Research Topics in Electromagnetics.....(3)
630	Digital Signal Processing.....(3)
635	Image Processing.....(3)
639	Advanced Topics in Signal Processing and Communications.....(3)
640	Continuous Stochastic Processes.....(3)
642	Signal Detection, Estimation, and Classification.....(3)
650	Electro-Optical Properties of Materials.....(3)
660	Electronic Device Design.....(3)
661	Solid-State Electronics.....(3)
662	Mos Device and Modeling.....(3)
663	Microwave Properties of Materials.....(3)
664	Saw Device Design, Modeling and Applications.....(3)
665	Integrated Circuits.....(3)
666	Advanced Topics in Solid State Electronics.....(3)
670	Quantum Electronics.....(3)
672	Molecular Properties in Electronic Devices.....(3)
681	Digital Processors.....(3)
682	Switching Theory.....(3)
683	Finite-State Machines.....(3)
685	Computer Design and Architecture.....(3)

686	Advanced Computer Architecture Design.....(3)
749	Dissertation Research.....(0)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
771	Seminar.....(0)
783	Special Problems in Electrical Engineering.....(1-3)
EGR 537	Numerical Analysis.....(3)
EGR 599	Topics in Engineering (Subtitle Required).....(1-3)
EGR 621	Computational Methods in Engineering.....(3)
EGR 622	Advanced Computational Methods in Engineering.....(3)
EGR 780	Topics in Engineering (Subtitle Required).....(1-3)

Engineering Mechanics

Graduate Faculty: Professors Millard F. Beatty, Ray M. Bowen, Louis Brock, Oscar W. Dillon, Jr., Donald C. Leigh, David J. Shippy, and Theodore T. Tauchert. Associate Professor Wei Lu.

Joint Appointment: Professor Graeme Fairweather.

The Department of Engineering Mechanics provides programs for study and research leading to the Master of Science in Engineering Mechanics and the Doctor of Philosophy. To be admitted to the master's degree program, a student normally must have at least an overall grade-point average of 3.0 and Graduate Record Examination scores of 700 (Quantitative) and 500 (Analytical).

The master's degree requires 24 credit hours of course work and a thesis (Plan A), or in some circumstances with departmental approval, 30 hours of course work and a research paper instead of a thesis (Plan B). In addition to the general information on the Ph.D. degree at the front of this Bulletin, note that the department requires a reading knowledge of one foreign language.

Most engineering disciplines exist to serve society directly. Engineering Mechanics, on the other hand, exists to serve all of these disciplines by concerning itself with the fundamental laws, mathematical formulation, and basic experimental methods common to all those phases of engineering which involve mechanics. Students enter the graduate program in Engineering Mechanics from all branches of engineering and also from mathematics and physics.

Areas of concentration for study are continuum mechanics, dynamical analysis, computational stress analysis, mechanical behavior of solids, experimental methods in solid mechanics. Typical areas in which research has been carried out in the department include infinitesimal and finite elasticity, plasticity, wave propagation, porous-media models, fracture mechanics, boundary-integral-equation methods, pres-

sure-vessel analysis, and composite materials. Investigations in these areas have included theoretical, experimental and numerical methods.

For further information contact the Director of Graduate Studies.

503	Introduction to Continuum Mechanics.....(3)
505	Viscoelasticity.....(3)
506	Mechanics of Composite Materials.....(3)
510	Dynamics and Design of Robotic Manipulators.....(3)
513	Mechanical Vibrations.....(3)
527	Applied Mathematics in the Natural Sciences I.....(3)
531	Advanced Strength of Materials.....(3)
532	Experimental Stress Analysis.....(3)
533	Aircraft and Missile Structural Analysis.....(3)
544	Introduction to Nondestructive Testing.....(3)
545	Advanced Kinematics.....(3)
585	Fourier Series and Boundary Value Problems.....(3)
599	Topics in Engineering Mechanics (Subtitle Required).....(1-3)
603	Mechanics of Plastic Solids I.....(3)
613	Nonlinear Oscillations.....(3)
628	Applied Mathematics in the Natural Sciences II.....(3)
645	Advanced Dynamics I.....(3)
646	Advanced Dynamics II.....(3)
651	Mechanics of Elastic Solids I.....(3)
652	Mechanics of Elastic Solids II.....(3)
653	Methods of Applied Differential Equations.....(3)
661	Nonlinear Continuum Mechanics I.....(3)
662	Nonlinear Continuum Mechanics II.....(3)
749	Dissertation Research.....(0)
760	Research Project in Engineering Mechanics.....(0)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
780	Special Problems in Engineering Mechanics.....(3)
EGR 537	Numerical Analysis.....(3)
EGR 599	Topics in Engineering (Subtitle Required).....(1-3)
EGR 621	Computational Methods in Engineering (3)
EGR 622	Advanced Computational Methods IN Engineering.....(3)
EGR 780	Topics in Engineering (Subtitle Required).....(1-3)

English

Graduate Faculty: Professors Wendell Berry, Joseph Bryant, John Cawelti, John L. Clubbe, Oscar Ronald Dathorne, Guy Davenport, James Baker Hall, Joan Hartwig, Kevin Kiernan, Stephen Manning, Jerome Meckier, Donald Ringe and John Shawcross. Associate Professors R. Gerald Alvey, Thomas Blues, William Campbell, Lee Elioseff, Percival Everett, Walter Foreman, Joseph Gardner, William Gordon, John L. Greenway, Armando Prats, Ellen B. Rosenman, Gregory T. Stump, Larry Swingle, Gregory A. Waller, Steven Weisenburger, and Arthur Wrobel.

Associate Members: Associate Professor David Durant. Assistant Professors Patrick C. Hogan, Lance Olsen, Janine Scancarelli and Patricia Troxol.

Emeritus Professors: Arthur Cooke, John Cutler, Thomas Stroup and William Ward.

The Department of English offers programs leading to the M.A. and to the Ph.D. degrees. The master's degree may be obtained either by Plan A or Plan B, as defined in this Bulletin. With the consent of the Dean of The Graduate School and the Director of Graduate Studies in English, students may undertake a program leading to the master's degree provided that they have

(1) completed the equivalent of a University of Kentucky undergraduate major in English and,

(2) fulfilled the admission requirements of The Graduate School. Applicants who fail to meet the first qualification may be admitted with the understanding that their program must include some advanced undergraduate work in English in addition to the courses normally required for the M.A. A reading knowledge of one foreign language is required for the master's degree.

Students will be evaluated on their merits before they are officially admitted to the doctoral program by the English graduate faculty. Students who received their master's degree from the University of Kentucky will be judged on their course grades, on the recommendations of their instructors, and their Graduate Record Examination scores on both the Aptitude and Advanced Literature tests. Students who have received their master's degree elsewhere will be evaluated on their course grades after the equivalent of one semester's full time graduate work at the University of Kentucky, instructor's recommendations, and GRE scores on both the Aptitude and Advanced Literature tests.

There is no specific requirement in a minor area, but such work may be required by a student's Advisory Committee if it appears to be essential to the major research or concentration interest. Ph.D. candidates normally offer German and French for their language requirement, but substitutions may be authorized according to the procedure described in this Bulletin.

A detailed statement of departmental requirements for both the M.A. and Ph.D. is available on request.

414G	Introduction to Modern English Linguistics.....(3)
420G	Studies in Medieval English Literature.....(3)
421G	Chaucer.....(3)
422G	English Renaissance: 1500-1600.....(3)
423G	English Renaissance: 1600-1660.....(3)
425G	Shakespeare Survey.....(3)
426G	Shakespeare Studies (Subtitle Required).....(3)
428G	Milton.....(3)
430G	The Restoration and Early 18th Century: 1660-1730.....(3)
431G	The Later 18th Century: 1730-1780.....(3)
435G	The Romantic Movement: 1780-1815.....(3)
436G	The Romantic Movement: 1815-1830.....(3)

438G	Victorian Period: 1830-1860.....(3)
439G	Victorian Period: 1860-1900.....(3)
440G	The Eighteenth Century English Novel.....(3)
441G	The Nineteenth Century English Novel.....(3)
442G	The Twentieth Century English Novel.....(3)
446G	Twentieth Century British Literature.....(3)
448G	English Drama: (Subtitle Required).....(3)
451G	Studies in American Literature before 1860: (Subtitle Required).....(3)
452G	Studies in American Literature: 1860-1920.....(3)
453G	Studies in American Literature Since 1900.....(3)
454G	American Novel Before 1900.....(3)
455G	Modern American Novel.....(3)
466G	Modern Drama.....(3)
472G	Special Topics in Folklore: (Subtitle Required).....(3)
473G	Survey of World Folklore.....(3)
475G	British and American Ballad and Folksong.....(3)
476G	Folklife and Material Folk Culture.....(3)
477G	Regional, Occupational, and Ethnic Folklore of the United States.....(3)
478G	Appalachian Folklore.....(3)
479G	The Folktale.....(3)
480G	Special Studies in Film.....(3)
507	Advanced Workshop in Imaginative Writing (Subtitle Required).....(3)
509	Composition for Teachers.....(3)
510	American English.....(3)
512	Modern English Grammar.....(3)
513	Teaching English as a Second Language.....(3)
514	Test Materials and Methods.....(3)
515	Phonological Analysis.....(3)
516	Grammatical Analysis.....(3)
519	Introduction to Old English.....(3)
560	Comparative Literature: Grecian and Roman.....(3)
561	Comparative Literature: Medieval and Renaissance.....(3)
562	Comparative Literature: Seventeenth Through Nineteenth Century.....(3)
563	Comparative Literature: Twentieth Century.....(3)
568	History of Literary Criticism I.....(3)
569	History of Literary Criticism II.....(3)
570	Selected Topics for Advanced Studies in Literature (Subtitle Required).....(3)
572	Studies in English for Teachers (Subtitle Required).....(3)
579	Oral Narration in Folk Cultures.....(3)
581	Aesthetics of Film.....(3)
600	Bibliography and Methods of Research.....(3)
607	Graduate Writing Workshop (Subtitle Required).....(3)
618	History of the English Language.....(3)
619	Beowulf.....(3)
620	Studies in Middle English Literature.....(3)
621	Studies in Chaucer.....(3)
622	Studies in English Literature: 1500-1600.....(3)
623	Studies in English Literature: 1600-1660.....(3)
625	Studies in Renaissance Drama Exclusive of Shakespeare.....(3)
626	Studies in Shakespeare.....(3)
628	Studies in Milton.....(3)
630	Studies in English Literature: 1660-1720.....(3)

631	Studies in English Literature: 1720-1780.....(3)
635	Studies in Literature: 1780-1815.....(3)
636	Studies in Literature: 1815-1830.....(3)
638	Studies in English Literature: 1830-1860.....(3)
639	Studies in English Literature: 1860-1900.....(3)
640	Studies in the 19th Century British Novel.....(3)
642	Studies in Modern British Literature.....(3)
643	Studies in Modern British and American Poetry.....(3)
651	Studies in American Literature Before 1860.....(3)
652	Studies in American Literature: 1860-1900.....(3)
653	Studies in American Literature since 1900.....(3)
656	Black American Literature.....(3)
660	Modern Critical Theory.....(3)
673	Studies in Folklore.....(3)
681	Studies in Film.....(3)
682	Studies in Fiction.....(3)
683	Studies in Drama.....(3)
684	Studies in Poetry.....(3)
700	Tutorial for Ph.D. Candidates.....(3)
720	Seminar in Medieval Literature.....(3)
722	Seminar in 16th Century Literature.....(3)
723	Seminar in 17th Century Literature.....(3)
726	Seminar in Shakespeare.....(3)
730	Seminar in 18th Century Literature.....(3)
735	Seminar in Romantic Literature.....(3)
738	Seminar in Victorian Literature.....(3)
740	Seminar in 20th Century British Literature.....(3)
749	Dissertation Research.....(0)
750	Seminar in Colonial Literature.....(3)
751	Seminar in American Literature: 1800-1860.....(3)
752	Seminar in American Literature: 1860-1900.....(3)
753	Seminar in American Literature since 1900.....(3)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
771	Seminar in Special Topics.....(3)
780	Directed Studies.....(1-3)
781	Seminar in Film (Subtitle Required).....(3)

Entomology

Graduate Faculty: Professors Douglas Dahlman, Paul Freytag, Fred Knapp, Gerald Nordin, Bobby Pass, Juan Rodriguez, and Kenneth V. Yeagan. Associate Professors Grayson Brown and Daniel A. Potter.

Associate Member: Assistant Professor Davy Jones.
Emeritus Professor: Richard Thurston.

The Department of Entomology offers graduate work leading to the Master of Science, Master of Science in Agriculture, and the Doctor of Philosophy degrees. Individual graduate programs are planned by the student in consultation with his adviser and the Director of Graduate Studies. Study and research are available in various areas

of entomology including applied entomology, behavior, biological control, host plant resistance, insect biology and ecology, molecular biology, pathology, immature insects, medical and veterinary entomology, biochemistry, physiology, taxonomy, and acarology. Plan A is offered for the master's degree. A reading knowledge of one modern foreign language is required for the Ph.D. degree.

530	Insect Pest Management.....(3)
561	Medical Entomology.....(4)
562	External Morphology of Insects.....(4)
563	Parasitology.....(4)
564	Insect Taxonomy.....(4)
568	Insect Behavior.....(3)
606	Insecticide Chemistry and Toxicology.....(3)
608	Behavioral Ecology.....(3)
609	Community and Ecosystem Ecology.....(3)
610	Organismal and Population Ecology.....(3)
626	Insect Pathology.....(3)
635	Insect Physiology and Internal Morphology.....(4)
645	Theory and Practice of Extension Entomology.....(3)
660	Immature Insects.....(3)
665	Insect Ecology and Behavior.....(3)
670	Experimental Methods in Entomology-Field.....(2)
671	Experimental Methods in Entomology-Laboratory.....(2)
680	Biological Control of Insects.....(3)
695	Special Topics in Entomology (Subtitle Required).....(3)
749	Dissertation Research.....(0)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
770	Entomological Seminar.....(1)
780	Special Problems in Entomology and Acarology.....(2-3)
790	Research in Entomology and Acarology.....(1-6)

Family Studies

Graduate Faculty: Professors Lisa Barclay, John Crosby, Peggy Meszaros and Melvin O. Weeks. Associate Professors Darla Botkin, Gregory Brock, Mary E. Edmondson, Raymond Forgue and David Payne.
Associate Members: Associate Professor Ruth Crum. Assistant Professors Karen Perch and Kimberley F. Townley. Extension Associate Professors Robert Harris Flashman and Samuel Quick.

The Department of Family Studies offers the Master of Science in Family Studies.

There are four areas of concentration: early childhood education; family economics and management; family development; and individual development within the family; (within the latter two areas of concentration the student may focus on educational prerequisites for marriage and family therapy).

The Master of Science in Family Studies requires 36 credit hours. At least two-thirds of the minimum requirements must be in regular courses, and at least half of the

minimum requirements must be in courses numbered on the 600 or 700 level. A minimum of 18 hours must be within the department. Plan A requires 36 hours, six of which are thesis credit hours; Plan B requires 36 class hours. Plan A is encouraged for students who may wish to emphasize theory and research and/or who plan to enter another advanced degree program. Electives within each area of concentration are available in the social sciences and in other supporting disciplines.

503	Family Housing Issues.....	(3)
507	Assessment of Young Children.....	(2)
509	The U.S. Family in Historical Perspective.....	(3)
510	Socialization in the Family.....	(3)
550	Child Development and Family Life in Appalachia.....	(3)
551	Woman in Contemporary Society.....	(3)
552	Organization and Administration of Early Childhood Education Programs.....	(3)
553	The Child in His/Her Family.....	(3)
554	Working with Parents.....	(3)
555	Fostering Cognitive Development in Children.....	(3)
557	Infant Development.....	(3)
558	Advanced Child Development.....	(3)
561	Management for Families with Limited Resources.....	(3)
562	Management for Multi-Roles.....	(3)
563	Families, Legislation and Public Policy.....	(3)
573	Family Life Education.....	(3)
585	Aging and Environment.....	(3)
586	Field Experience in Family Economics and Management.....	(1-6)
595	Special Problems in Individual and Family Development.....	(1-3)
596	Special Problems in Family Economics and Management.....	(1-3)
599	Field Experiences.....	(3)
602	Consumer Economics.....	(3)
603	Theory and Research in Family Economics and Management.....	(3)
604	Culturally Different Children and Families.....	(3)
605	Practicum in Directing Early Childhood Programs.....	(4)
624	Perspectives on Human Sexuality.....	(3)
652	Readings in Family Relations.....	(3)
653	Family Theory and Dynamics.....	(3)
654	Life Span Human Development and Behavior.....	(3)
655	Theory and Dynamics of Human Development.....	(3)
656	Adult Development in the Family.....	(3)
657	Family Systems Theory.....	(3)
658	Adolescent Development.....	(3)
662	Social and Economic Decision Making in the Family.....	(3)
668	Allocation of Family Resources.....	(3)
684	Family Management Analysis.....	(3)
686	Theory and Methods in Marriage and Family Counseling.....	(3)
687	Treatment Modalities in Marriage and Family Therapy.....	(3)
688	Family Stress and Therapeutic Intervention.....	(3)
689	Perspectives on Divorce and Remarriage.....	(3)
768	Residence Credit for the Masters Degree.....	(1-6)

773	Seminar in Family Economics and Management.....	(3)
775	Seminar in Human Development and Family Relations.....	(3)
785	Advanced Problems in Individual and Family Development.....	(1-3)
786	Advanced Problems in Family Economics and Management.....	(1-3)
787	Supervised Experience in the Practice of Marriage and Family Therapy.....	(3)
790	Familial and Developmental Research Methods.....	(3)

Forestry

Graduate Faculty: Professor Bart Thielges, Associate Professors Sun J. Chang, George Coltharp, Calvin Liu, Robert Muller, and James R. Olson.

Associate Members: Associate Professor Donald Graves, Assistant Professors Paul J. Kalisz, Thomas W. Kimmerer, James M. Ringe and David Wagner. Extension Associate Professor Deborah B. Hill.

Joint Appointments: Professor Louis Shani.

The department offers graduate work leading to the Master of Science in Forestry and Master of Science in Agriculture (Forestry area of specialization). Degrees are awarded under Plan A only, which requires a minimum of 24 semester hours of graduate course work plus an acceptable thesis. The prospective student must have an undergraduate degree in forestry or be prepared to take a core of forestry courses in addition to a full master's program.

The study and research program may be directed to any one of the following areas; wood science, forest soils, forest hydrology and water quality, forest ecology, tree physiology, forest wildlife, forest biometrics, forest economics and silviculture.

Students interested in pursuing further graduate studies (Ph.D.) in the forestry area may enter one of several interdepartmental programs such as plant physiology, crop science, soil science and agricultural economics.

Additional information concerning the graduate program in forestry may be obtained by contacting the Director of Graduate Studies.

460G	Forest Watershed Management.....	(3)
511	Forest Regeneration.....	(3)
512	Forest Tree Physiology.....	(3)
564	Forest Soils.....	(3)
599	Independent Work in Forestry.....	(1-3)
601	Research Methods in Forestry.....	(3)
605	Wood Quality.....	(3)
608	Behavioral Ecology.....	(3)
609	Community and Ecosystem Ecology.....	(3)
610	Population Ecology.....	(3)
611	Forest Genetics.....	(3)
612	Forest Ecosystem Analysis.....	(3)
620	Special Topics in Forestry (Subtitle Required).....	(3)
628	Mechanics of Wood and Fiber Composites.....	(3)

629	Advanced Wood Physics.....	(3)
630	Wildlife Habitat Analysis.....	(3)
645	Forest Inventory Systems.....	(3)
650	Silviculture of Eastern Deciduous Forests.....	(2-3)
662	Quantitative Methods in Renewable Resource Management.....	(3)
670	Wildland Water Quality.....	(3)
768	Residence Credit for Master's Degree.....	(1-6)
770	Forestry Seminar.....	(1)
781	Special Problems in Forestry.....	(1-3)
791	Research in Forestry.....	(1-3)

French Language and Literature

Graduate Faculty: Professors Jean Charron, Phillip Duncan, Raymond La Charite, Virginia La Charite, and Rupert Pickens. Associate Professor John Rea. **Emeritus Professors:** Clark L. Keating and Theodore H. Mueller.

The Department of French Language and Literature offers a graduate program leading to the M.A. degree in French language and literature. The department offers the M.A. degree according to Plan B only. The students select a program from a variety of courses listed below in French literature, language, civilization, cinema and literature and the arts. They are then examined over their program. The master's examination for each candidate is prepared and evaluated by a committee of three members of the French graduate faculty which will consider the candidate's course program in preparing the examination.

Candidates must also demonstrate a reading knowledge of another foreign language. The M.A. examination will be given every March and July. Applications for the examination should be made to the Director of Graduate Studies no later than 14 days prior to the date of examination.

For further information concerning the M.A. program in French, consult the Director of Graduate Studies.

All courses listed below are offered on a rotating basis and not less frequently than every eighth semester.

423G	French Literature in Translation: Twentieth Century.....	(3)
436G	A Survey of French Literature of the Middle Ages and Renaissance.....	(3)
438G	A Survey of French Literature of the 17th and 18th Centuries.....	(3)
439G	A Survey of French Literature of the Nineteenth Century.....	(3)
440G	A Survey of French Literature of the Twentieth Century.....	(3)
460G	Masterpieces of the French Novel.....	(3)
461G	Masterpieces of French Drama.....	(3)
462G	Masterpieces of French Poetry.....	(3)
500	Introduction to French Film.....	(3)
501	French Literature and the Arts: The Middle Ages.....	(3)

502	French Literature and the Arts: La Belle Epoque.....(3)
503	French Literature and the Arts: Surrealism.....(3)
504	Topics in French Literature and Culture (Subtitle Required).....(3)
507	Interpretation and Style.....(3)
510	Linguistic Structure of Modern French.....(3)
516	Introduction to Early French.....(3)
550	France Today.....(3)
553	The Teaching of Modern Foreign Languages.....(3)
600	Special Topics in French Film.....(3)
601	Poetic Vision (Subtitle Required).....(3)
602	Narrative Tradition (Subtitle Required).....(3)
603	The Development of the French Language.....(3)
604	The Tragic Mode (Subtitle Required).....(3)
605	Comic Fiction (Subtitle Required).....(3)
606	Literature of the Middle Ages.....(3)
608	Renaissance Storytellers.....(3)
609	Classic Theater.....(3)
615	The Age of Voltaire.....(3)
617	Romanticism.....(3)
620	The New Avant-Garde: Literary Trends Since World War II.....(3)
621	Contemporary French Theatre (Subtitle Required).....(3)
650	Cultural History of the French People.....(3)
768	Residence Credit for Master's Degree.....(1-6)
769	Residence Credit for Doctor's Degree.....(0-12)
780	Special Studies in French.....(3)

Geography

Graduate Faculty: Professors Stanley Brunn, P.P. Karan, Thomas Leinbach, Karl Raitz, Graham Rowles, Gary Shannon and Richard Ulack. Associate Professors W.A. Bladen and William A. Withington.

Associate Member: Assistant Professors Carl G. Amrhein and John Paul Jones.

Emeritus Professor: Thomas Field.

The Department of Geography offers both M.A. (Plan A and Plan B) and Ph.D. programs. The professional training in the doctoral and master's programs provides research-oriented and applied analytical skills relevant to present and anticipated future needs for geographers. The research training and skills of individual graduate students are developed in research seminars and course work in several areas including:

Cultural: historical, landscapes, ethnicity.

Economic and Urban: transportation, industrial, labor migration, city growth and decline.

Environment and Resources: agricultural, land use, rural.

Geographic Techniques: quantitative cartography, remote sensing, information systems, field, qualitative.

Planning and Policy: local, regional, international development.

Social and Political: medical, population, the nation-state, ethnicity, hazards.

Third World: Middle East, South Asia, Southeast Asia, Caribbean.

The faculty includes members who have a major regional research interest, including extensive field experience, in the following areas: Southeast and South Asia, including adjacent Himalayan or highland Asia; and North America, including the Southeast and Appalachia.

Applicants for the Ph.D. in geography must conform to the general requirements of The Graduate School as set forth in the first part of this Bulletin. Course work required in the Ph.D. program consists of (1) core courses (GEO 700, 702, 707) in the theory and methodology of geography; (2) seminars, independent study and directed research in one of the research focuses noted above or in cognate disciplines; (3) successful examination in one modern foreign language; and (4) a dissertation based on original research. A program designed to meet the professional academic goals of each doctoral candidate is outlined in consultation with the Director of Graduate Studies and the candidate's Advisory Committee.

Applicants for the M.A. degree in geography follow a broadly based program which consists of: 1) required courses (GEO 600, 702, and 710); 2) elective courses in geography and cognate disciplines according to the student's academic goals and career objectives; and 3) the completion of a master's thesis.

At the student's option and with the approval of the Director of Graduate Studies, a non-thesis degree (Plan B requiring six additional credits) is permitted. The M.A. student may not take more than six hours of course work below the 600 level. The program is tailored to meet each student's particular needs and requirements, and numerous interdisciplinary topics may be chosen for study.

All graduate students are expected to demonstrate competence in basic research skills and tools, in critical analysis, scientific writing, and accurate verbalization as part of the degree requirement. During initial phases of graduate work, a strong emphasis is placed upon acquiring competence in the fields of bibliographic techniques, quantitative analysis, and the application of field and quantitative techniques to geographic problems.

405G	Cartographic Production and Design.....(3)
410G	Planning Theory.....(3)
420G	Urban and Regional Planning.....(3)
430G	Urban Land Use Planning.....(3)
450G	Planning Research Methods and Writing.....(3)
475G	Medical Geography.....(3)
485G	Social Geography.....(3)

490G	American Landscapes.....(3)
505	Practicum in Cartography.....(3)
506	Introduction to Computer Cartography.....(3)
507	Remote Sensing for Geographers and Planners.....(3)
508	Geographic Interpretation of Aerial Photography.....(3)
524	Geography of Latin America.....(3)
526	Geography of Europe.....(3)
529	Geography of East Europe, Soviet Union and China.....(3)
530	Geography of South Asia.....(3)
532	Geography of Southeast Asia.....(3)
536	Geography of Africa.....(3)
540	Urban Geography.....(3)
542	Political Geography.....(3)
544	Population Geography.....(3)
545	Transportation Geography.....(3)
546	Spatial Development and Policy.....(3)
547	Geography of Information and Communication.....(3)
550	Geography of Energy and Natural Resources.....(3)
555	Industrial Location.....(3)
560	Independent Work in Geography.....(3)
565	Topics in Geography.....(3)
585	Aging and Environment.....(3)
600	Analytic Methods in Geography.....(3)
601	Field Methods in Geography.....(3)
630	Regional Study of Special Areas.....(3)
640	Transportation Analysis.....(3)
643	Urban Transportation Planning.....(3)
655	Special Study of Systematic Geography.....(3)
695	Social Ecology.....(3)
700	Advanced Analytical Methods in Geography.....(3)
702	Concepts in Geography.....(3)
707	Seminar in Development of Geographic Thought.....(3)
710	Research Methods and Methodology in Geography.....(3)
716	Topical Seminar in Cultural Geography (Subtitle Required).....(3)
717	Topical Seminar in Economic and Urban Geography (Subtitle Required).....(3)
718	Topical Seminar in Geography of Environment and Resources (Subtitle Required).....(3)
719	Topical Seminar in Geography of Planning and Policy (Subtitle Required).....(3)
721	Topical Seminar in Geographic Techniques (Subtitle Required).....(3)
722	Topical Seminar in Social and Political Geography (Subtitle Required).....(3)
723	Topical Seminar in Geography of the Third World (Subtitle Required).....(3)
730	Seminar in Regional Geography.....(3)
740	Internship in Applied Geography.....(3)
749	Dissertation Research.....(0)
768	Residence Credit for the Master's Degree.....(3)
769	Residence Credit for the Doctor's Degree.....(3)
771	Seminar in Special Topics in Geography.....(3)
772	Special Research Problems in Geography.....(3)

Geology

Graduate Faculty: Professors W.H. Blackburn, Frank

R. Ettensohn, J.C. Ferm, Frank E. Huggins, N. Rast, Lyle Sendlein and J. Thraillkill. Associate Professors Bruce R. Moore and Ronald Street.

Associate Members: Assistant Professors James Gregory McHone, Stephen O. Moshier, Kieran O'Hara, Susan M. Rimmer and Rene Rodriguez. Adjunct Assistant Professors James C. Cobb, James Dinger and James C. Hower.

Joint Appointment: Professor Richard I. Barnhisel.

Emeritus Professors: W.R. Brown, William Dennen, I.S. Fisher, William C. MacQuown, Arthur McFarlan and Vincent Nelson.

The Department of Geological Sciences offers graduate work leading to the M.S. and to the Ph.D. degrees. The department of Geological Sciences offers a Plan A M.S. (thesis option) and the Ph.D. in all disciplines represented by Departmental faculty. A non-thesis Plan B M.S. is also offered in the field of hydrogeology. The credentials of each applicant are considered individually and applicants from other scientific disciplines are encouraged to apply. Applicants with backgrounds not in the geological sciences will be required to attain proficiency through course work in pertinent subjects. All applicants should have demonstrated competence at the undergraduate level and a grounding in the basic sciences equivalent to that of B.S. graduates of this department. Deficiencies in geosciences, allied sciences and mathematics must be removed by such course work as the departmental committee on graduate studies may specify. In most cases, candidates for the M.S. degree must submit a thesis that demonstrates ability to conduct sound research. A non-thesis option is also available for M.S. students in the field of hydrogeology. Candidates for the Ph.D. must submit a dissertation based on original and significant research, demonstrate reading ability in one foreign language common to the scientific literature, and be the sole or senior author of a research article accepted for publication in a refereed journal.

The principal areas of study offered are carbonate petrology, coal geology, earthquake and exploration seismology, geochemistry, hydrogeology, igneous and metamorphic petrology, paleontology, organic petrology, sedimentology, stratigraphy, structural geology and tectonics.

Resources for the conduct of advanced studies include reference collections; an excellent library; sample preparation and field equipment; portable diamond-drilling apparatus; and field vehicles. The geochemical and mineralogical laboratories include equipment for x-ray fluorescence and diffraction, Mossbauer spectrometry; spectrophotometry; spectrofluorometry; gamma-ray spectrometry; fluid inclusion investigations; and laser emission spectrography.

Research apparatus for remote sensing; petrographic microscopy; organic petrography, including quantitative spectral fluorescence analysis; cathodoluminescence; and specialized equipment for sedimentologic and paleontologic studies are available within the department. Geophysical facilities include the eight-station Kentucky Digital Seismic Network with a borehole digital strong-motion accelerometer, a 24-channel seismic reflection/refraction unit with energy sources, a resistivity unit, a gravimeter, and magnetometers.

Additional extra-departmental facilities for mainframe computing, neutron activation, electron microscopy, and clay mineralogy are available.

420G	Structural Geology.....	(3)
450G	Stratigraphy and Sedimentation.....	(3)
510	Ore Deposits.....	(3)
511	Petroleum Geology.....	(3)
513	Remote Sensing and Aerial Photography.....	(3)
515	General Coal Geology.....	(3)
530	Low Temperature Geochemistry.....	(3)
531	Igneous and Metamorphic Geochemistry.....	(3)
540	Advanced General Geology.....	(3)
552	Sedimentary Petrology.....	(3)
560	Optical Mineralogy.....	(3)
571	Application of Potential Methods in Applied Geophysics.....	(3)
572	Seismology and Seismic Exploration.....	(3)
602	Paleoecology.....	(3)
603	Micropaleontology.....	(3)
612	Mineral Deposits.....	(3)
615	Coal Mining and Exploration Geology.....	(3)
617	Coal Petrology.....	(3)
620	Tectonics.....	(3)
624	Mesoscopic Structures.....	(3)
628	Basin Analysis Seminar.....	(3)
640	Analytic Methods in Geology.....	(3)
650	Terrigenous Depositional Systems.....	(3)
652	Paleozoic Stratigraphy.....	(3)
653	Mesozoic and Cenozoic Stratigraphy.....	(3)
654	Petrology of Carbonate Rocks.....	(3)
654	Carbonate Petrology.....	(3)
655	Hydrogeology.....	(3)
660	Petrography.....	(3)
662	X-Ray Mineralogy.....	(3)
663	Metamorphic Petrology.....	(3)
664	Igneous Petrology.....	(3)
670	Selected Topics in Geophysics.....	(3)
671	Earthquake Seismology.....	(3)
681	Mineralogical and Chemical Analysis of Soils.....	(4)
685	Hydrogeology.....	(3)
703	Paleoecology Seminar.....	(1-3)
715	Coal Geology Seminar.....	(2)
720	Graduate Tectonics Seminar.....	(3)
725	Coal Geology Seminar.....	(2)
741	Clay Mineralogy.....	(3)
749	Dissertation Research.....	(0)
750	Kentucky Sedimentology Seminar.....	(1-3)
757	Research in Hydrogeology and Low-Temperature Geochemistry.....	(3)
760	Topics in Igneous and Metamorphic Petrology.....	(2)
768	Residence Credit for Master's Degree.....	(1-6)

769	Residence Credit for Doctor's Degree.....	(0-12)
782	Individual Work in Geology.....	(1-3)
787	Research in Hydrogeology and Low-Temperature Geochemistry.....	(3)

Germanic Languages and Literatures

Graduate Faculty: Professors Gerald J. Janeczek and Brend Kratz. Associate Professors Theodore Fiedler and Phillip S. McKnight.

Associate Members: Assistant Professors Jeannine Blackwell and Linda Worley.

Emeritus Professors: J. Wesley Thomas and Paul Whitaker.

The general goal of graduate work in German is to provide students with a critical understanding of German culture, its language and literature and its relationship to western civilization as a whole. Specific courses are designed to acquaint students with the aims and methods of research in the fields of language pedagogy, literary and cultural history, literary theory, and historical linguistics. Students working as teaching assistants under faculty supervision have ample opportunity to develop effective teaching skills in a controlled setting.

The department offers graduate programs leading to the M.A. (Plan A or B) and Ph.D. degrees in German. At the present time only applications for the master's degree are being considered. Competence in another foreign language, normally French, in addition to German is required for graduate degrees.

Admission requirements include an acceptable undergraduate major in German and a satisfactory score on the Graduate Record Examination. Applicants lacking more comprehensive knowledge of German language and literature may be admitted with the understanding that their program must include some advanced undergraduate work in addition to those courses normally required for the M.A.

Individual programs of study are planned with consideration of the student's competencies and interests. Thus, the department endeavors to be flexible and in teacher preparation, for example, to accommodate particular emphasis appropriate for prospective instruction in elementary and secondary schools or two or four-year colleges.

Areas of specialization of the graduate faculty of the department afford flexible coverage in breadth and depth, with particular strength in medieval studies, literature from the Enlightenment to the present, literary theory, women's studies, language pedagogy, and intellectual history. The department serves as the editorial cen-

ter for the international journal, *Colloquia Germanica*. Graduate students are encouraged to participate in the editorial work. The University has substantial holdings in all areas of German language, linguistics and literature and in supporting fields.

415G	Major German Authors (Subtitle Required).....(3)
416G	Genres of German Literature.....(3)
420G	Special Studies in German Literary and Cultural History (Subtitle Required).....(3)
507	Advanced German Composition and Conversation.....(3)
510	Medieval Scandinavian Literature in Translation.....(3)
511	Scandinavian Literature in Translation: Holberg to Lagerkvist.....(3)
512	Introduction to Graduate Studies.....(3)
515	Studies in German Literary History.....(3)
517	Studies in German Cultural History.....(3)
520	Special Topics Seminar.....(3)
531	Structure of the German Language.....(3)
532	History of the German Language.....(3)
533	Introduction to Middle High German.....(3)
534	Life and Works of Goethe.....(3)
553	The Teaching of German.....(3)
610	Old Icelandic.....(3)
612	Studies in Literary Theory.....(3)
615	Studies in Major Authors.....(3)
616	Studies in Genre.....(3)
620	Studies in the Middle Ages.....(3)
623	Studies in the 15th and 16th Centuries.....(3)
624	Studies in the 17th Century.....(3)
625	Studies in the 18th Century.....(3)
629	Studies in the 19th Century.....(3)
630	Studies in the 20th Century.....(3)
633	Old High German.....(3)
635	Gothic.....(3)
720	Special Topics in the Middle Ages.....(3)
723	Special Topics in the 15th/16th Centuries.....(3)
724	Special Topics in the 17th Century.....(3)
725	Special Topics in the 18th Century.....(3)
729	Special Topics in the 19th Century.....(3)
730	Special Topics in the 20th Century.....(3)
768	Residence Credit for Master's Degree...(1-6)
769	Residence Credit for Doctor's Degree...(0-12)
781	Special Studies in German.....(3)
790	Germanic Seminar.....(3)

Health, Physical Education and Recreation

Graduate Faculty: Professors Dean Currier, Joseph Gruber, and Pentti Teraslinna. Associate Professors Robert Bulbulian, Sharon Hunt, Melody P. Noland, Richard S. Riggs, Robert Shapiro, Dennis Vinton and Andrew Weiner.

Associate Members: Associate Professor John Hall. Assistant Professors Scott Minor, Arthur J. Nitz and Joseph Threlkeld.

Emeritus Professors: Ernest Jokl, Earl Kauffman and Alfred Reece.

The Department of Health, Physical Education and Recreation offers graduate work leading to the Master of Science degree with an area of concentration in health

education, or physical education or recreation. Within these areas students may sub-specialize in school health; physical education teaching and coaching; exercise physiology, sport psychology, biomechanics, physical therapy, therapeutic recreation or recreation administration. Additionally, the department offers work leading to an Ed.D. degree in physical education. Specialty areas similar to those available in the master's program may be developed in the Ed.D. Specifics of this program area are available from the Director of Graduate Studies.

The master's program in health, physical education and recreation is designed to provide a high-quality graduate program for the following two types of students: (1) active, motivated individuals who desire advanced study to enhance their professional adequacy, and (2) discipline-oriented students completing a master's as an intermediate step toward doctoral work. The objective of the program is to prepare the student to: (1) effectively locate, analyze, and use significant elements of the professional literature and research materials, (2) permit an in-depth study of a specialized content area within the field, and (3) acquire a knowledge of sound research procedures.

The program needed to accomplish this objective involves a combination of departmental course offerings, supporting electives, and a required core of statistics and research methods. Inasmuch as the fields of health, physical education, and recreation draw their principles from a variety of disciplines, it is appropriate that certain electives be chosen from the supportive areas of the biological and physical sciences and the behavioral and social sciences. Master's candidates with the approval of the department may select either a thesis (Plan A) or a non-thesis option (Plan B).

Applicants are expected to have a minimum of 21 undergraduate hours in their respective fields. The prerequisites for graduate study follow.

Prerequisites for Graduate Study in Physical Education

Students entering the graduate program in physical education must have a completed degree in physical education (or equivalent) with course work in anatomy, exercise physiology, biomechanics/kinesiology, and measurement. Students with degrees from other disciplines may be admitted if they possess an adequate background in the above mentioned areas. The student is also expected to have demonstrated competencies in 4 selected physical activities. Applicants lacking any appropriate prerequisites or competencies will be expected to

satisfy them in a timely manner via directed readings, competency examinations, independent studies, or prescribed course work. The prerequisite work is in addition to the normal 30-hour master's program. Additional prerequisites and competencies for specific areas of subspecialization in physical education can be obtained from the Director of Graduate Studies.

Biomechanics

Math 113—Calculus I
Math 114—Calculus II
Physics 201—General Elementary Physics
Computer Science 221—First course in Computer Science for Engineers

Teaching/Coaching

Administration in Physical Education
Adapted Physical Education
First Aid/Athletic Training
Child Growth and Motor Development
PE in Secondary Schools*
Dance in Elementary School*
Ten (10) Activity Classes
Student Teaching in P.E./Similar clinical experience
*Additional requirements for students specializing in Elementary Physical Education

Exercise Physiology/Adult Fitness

Anatomy (ANA 511 or equivalent)
Physiology (PGY 412g or equivalent)
Exercise Physiology (HPR 420g or equiv.)
Biochemistry (BCH 401g or equivalent)
Tests & Measurements (HPR 445 or equiv.)

Sport Psychology

Introduction to Psychology*
Educational Psychology
Social Psychology
Abnormal Psychology
Developmental Psychology
Experimental Psychology
Counseling Psychology
Cognitive Psychology
*Must satisfy three areas in addition to Introductory Psychology

Physical Therapy

2 years Experience as a Physical Therapist*
Kentucky eligibility for P.T. license
Anatomy & Physiology
Physiology of Exercise
Tests & Measurements in P.E.
Treatment of Athletic Injuries
Electives in P.E., Health Ed., Physical Therapy, Biological Sciences
*Applies to full time students only.

Prerequisites for Graduate Studies in Recreation and Leisure Studies

Students seeking admission to the Master of Science Degree Program in Recreation and Leisure Studies are expected to have a minimum of 21 undergraduate hours to be selected from the following courses:

Introduction to Community Recreation	3 hrs.
Recreation Program Planning & Leadership	3 hrs.
Administration & Organization of Recreation	3 hrs.

Therapeutic Recreation Course Work	(Any 1 of 3 courses)	
OR		
Principles of Outdoor Recreation		3 hrs.
Supervised Field Study in Recreation		2 hrs.
Laboratory courses in the areas of: sports, music, art, theater, camping or dance		3 hrs.
Electives—courses supporting area of specialization		4 hrs.
TOTAL		21 hrs.

Applicants lacking these prerequisites will be expected to work with their adviser to satisfy them via directed readings, competency examinations, or prescribed course work. The prerequisite work is in addition to the normal 30-hour master's program.

Prerequisites for Graduate Study in Health Education

Anatomy and Physiology	3-6 hrs.
Problems and Issues in School Health Education or Personal Health	2-3 hrs.
School Health Education	3 hrs.
First Aid and Emergency Care	2 hrs.
Methods in Health Education	2-3 hrs.
Special Topics in Health Education (depends on number of hours completed from courses listed above)	4-9 hrs.
TOTAL	21 hrs.

Recommended Courses to be completed under Special Topics:

- Sex Education
- Drug Education
- Nutrition
- Community Health
- Death Education
- Aging Education

Others may be accepted at the discretion of the adviser.

Applicants lacking these prerequisites will be expected to work with their adviser to satisfy them via directed readings, competency examinations, or prescribed course work. The prerequisite work is in addition to the normal 30-hour master's program.

Students who have a strong background in related biological or behavioral science fields may be considered for admission providing they agree to satisfy prerequisites established in each field. Applicants lacking these prerequisites will be expected to satisfy them via directed readings, competency examinations, or prescribed course work. This is in addition to the normal 30-hour master's program.

General Requirements

Regardless of whether the student concentrates in the physical education areas, health education, therapeutic recreation, or recreation administration, all candidates are required to complete the following.

PLAN A (Thesis Option)

EDP 557 Educational Statistics	3-4
or	
STA 570 Basic Statistical Analysis	

HPR 644 Research Techniques Applied to Health, Physical Education and Recreation	3
Supporting Electives	6
HPR Area of Concentration	12
HPR Residence Credit for the Master's Degree(768)	6
Total	30-31

or PLAN B (Non-Thesis Option)

EDP 557 Educational Statistics	3-4
or	
STA 570 Basic Statistical Analysis	3-4
HPR 644 Research Techniques Applied to Health, Physical Education and Recreation	3
HPR 782 Independent Research Project	3
Supporting Electives	6
HPR Area of Concentration	15
Total	30-31

For additional information, write to the Director of Graduate Studies, Department of Health, Physical Education and Recreation.

420G Physiology of Exercise.....	(3)
509 Workshop in Health and Safety.....	(1-3)
515 Anatomical and Mechanical Kinesiology.....	(3)
530 Administration of Health and Safety Education.....	(3)
535 School Health Dilemmas of Special Populations.....	(3)
546 Physical Education Workshop.....	(1-3)
547 Psychology of Sport and Physical Activity.....	(3)
548 Special Topics in Recreation and Leisure Studies.....	(1-3)
549 Special Topics in Physical Education.....	(1-3)
560 Motor Development in Infants and Young Children.....	(3)
570 Landscape Design of Park and Recreation Areas.....	(3)
572 Principles and Practices in Therapeutic Recreation.....	(3)
573 Administration and Organization of Recreation.....	(3)
575 Interpretations of Leisure and Recreation.....	(3)
576 Intramural Programming and Administration.....	(3)
577 Practicum in Recreation.....	(3-9)
579 Adapted Physical Education.....	(3)
592 Choreography.....	(2)
593 Dance Production.....	(3)
600 Exercise Stress Testing and Prescription.....	(3)
609 Seminar in Health and Safety Education.....	(3)
610 The Organization and Administration of Therapeutic Recreation Programs.....	(3)
611 Therapeutic Applications of Recreation.....	(3)
615 Biomechanics of Fundamental Movements.....	(3)
616 Biomechanics of Sport.....	(3)
620 Advanced Exercise Physiology.....	(3)
621 Exercise and Coronary Heart Disease.....	(3)
622 Physical Fitness and Related Concepts.....	(3)
644 Research Techniques Applied to Health, Physical Education and Recreation.....	(3)
645 Measurement Theory in Health, Physical Education and Recreation.....	(3)

646 Integrated Development.....	(3)
647 Motor Learning.....	(3)
650 Curriculum and Program Development.....	(3)
651 Facilities, Construction, and Equipment.....	(3)
676 Current Issues in Recreation.....	(3)
685 Administrative Practices in Recreation.....	(3)
694 Independent Study in Health Education.....	(1-3)
695 Independent Study in Physical Education.....	(1-3)
696 Independent Study in Recreation.....	(1-3)
720 Sports Medicine.....	(3)
741 Current Studies and Trends in Health and Physical Education.....	(3)
749 Dissertation Research.....	(0)
768 Residence Credit for the Master's Degree.....	(1-6)
769 Residence Credit for the Doctoral Degree.....	(0-12)
770 Seminar in Physical Education.....	(3)
780 Seminar in Recreation.....	(3)
781 ProSeminar in HPR (Subtitle Required).....	(1-3)
782 Independent Research.....	(3)

Health Radiation Sciences

Graduate Faculty: Associate Professor Ralph Christensen.

Joint Appointments: Professors John C. Calkins and Yosh Maruyama. Associate Professors Joseph L. Beach, Joseph A. Sayeg and Guy H. Simmons.

Health Radiation Sciences offers a program in Radiation Science leading to the degree of Master of Science in Health Physics and Master of Science in Radiological Medical Physics.

Graduates of accredited colleges with an appropriate baccalaureate degree (e.g., physics, chemistry, engineering, biology, etc.) may become candidates for one of these degrees. Prerequisites include physics through atomic and nuclear physics (with laboratory), one year of undergraduate biology, one year of general chemistry, differential and integral calculus, and individual courses in computer science, statistics, and human physiology. Students lacking certain course prerequisites may be admitted on a provisional basis while completing them, if so approved by the program director.

Both degree options are interdisciplinary. As such, Plan B is utilized for the graduate work, incorporating specific courses in several departments. There is no language requirement. A core of courses is common to both options. Additional special course work is prescribed for each option as degree requirements.

CORE PROGRAM

BIO/RM 640 Biological Effects of Radiation.....	(3)
RM/BIO 740 Mammalian Radiation Biology.....	(2)
PHY/RM 472G Interaction of Radiation with Matter.....	(3)

RM/PHY/HRS 545 Radiation Hazards and Protection.....(3)	
HRS/RM/PHY 546 General Medical Radiological Physics.....(3)	
HRS/RM 601 Advanced Radiation Dosimetry.....(2)	
HRS 710 Seminar in Bioradiation Science.....(1)	
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Master of Science in Radiological Medical Physics

ADDITIONAL PROGRAM

ANA 511 Introduction to Anatomy.....(5)	
HRS/RM 647 Physics of Diagnostic Imaging I.....(3)	
HRS/RM 648 Physics of Diagnostic Imaging II.....(3)	
HRS/RM 649 Physics of Radiation Therapy.....(2)	
HRS 715 Advanced Problems in Radiation Dosimetry.....(2)	
	Total 32 (minimum)

A clinical practicum and applied laboratory experiences in Radiological Medical Physics will continue following completion of formal course work. This work will be under the staff of the Department of Radiation Medicine.

Master of Science in Health Physics

HRS 575 Applied Health Physics Laboratory.....(2)	
HRS 720 Advanced Problems in Radiological Health.....(2)	
Specialization Electives.....(11)	
	Total 32 (minimum)

Available Specialization Electives (partial listing)

CHE 520/521 Radiochemistry (and Laboratory).....(5)	
PHY 402G Electronic Instrumentation and Measurements.....(3)	
PHY 416G/471G Electricity and Magnetism.....(6)	
PHY 520 Quantum Mechanics.....(3)	
PHY 554/555 Fundamental Atomic & Nuclear Physics.....(6)	
HRS 640 Research in Radiation Health.....(1-3)	
HRS 645 Research in Radiation Dosimetry.....(1-3)	
HRS 715 Advanced Problems in Radiation Dosimetry.....(2-6)	
HRS/RM 647, 648 Physics of Diagnostic Imaging I and II.....(6)	
ME 475G Introduction to Nuclear Engineering.....(3)	
ME 515 Fuel Management and Economics of Nuclear Reactors.....(3)	

545 Radiation Hazards and Protection.....(3)	
546 General Medical Radiological Physics.....(3)	
575 Applied Health Physics Laboratory.....(2)	
601 Advanced Radiation Dosimetry.....(2)	
647 Physics of Diagnostic Imaging I.....(3)	
648 Physics of Diagnostic Imaging II.....(3)	
649 Physics of Radiation Therapy.....(2)	
690 Research in Radiological Health.....(1-3)	
695 Research in Radiation Dosimetry.....(1-3)	
710 Radiation Science Seminar (Subtitle Required).....(1)	
715 Advanced Problems in Radiation Dosimetry.....(2-6)	
720 Advanced Problems in Radiological Health.....(2-4)	

History

Graduate Faculty: Professors Lance Banning, Raymond Betts, Randolph Daniel, Nancy Dye, Bruce S. Eastwood, George Herring, Robert Ireland, Humbert Nelli, Robert Olson, Jeremy Popkin, Gerard Silberstein, Joe Thompson and Robert Warth. Associate Professors James Albisetti, William Chambliss, Eric Christianson, Ron Eller, Donald Nugent, Daniel Smith and Mark W. Summers.

Associate Members: Associate Professor Daniel Rowland. Assistant Professors Francie Chassen-Lopez, Thomas E. Cogswell, David E. Hamilton, David M. Olster and John A. Walsh.

Emeritus Professors: Harry Caudill, Thomas Clark, Clark Cone, Mary Wilma Hargreaves, James Hopkins, Robert Lunde, Charles Roland, Charles Talbert and Rhea Taylor.

The Master's Program

Students should submit evidence of strong undergraduate preparation in history, preferably an undergraduate major with a minimum grade-point average of 2.8 on a 4.0 scale. Applicants for admission must submit Graduate Record Examination scores and three letters of recommendation from professors familiar with their work. Background in at least one modern foreign language is recommended for admission. Students will not receive the M.A. degree in history unless they demonstrate reading knowledge of a modern foreign language approved by the Department of History and by The Graduate School. Both Plan A and Plan B are offered.

The Ph.D. Program in History

Those who seek the doctorate in history should follow carefully the general directions governing the subjects of residence, courses, and foreign language requisites set forth in the first part of the Bulletin. The applicant does not become a candidate until knowledge of one modern foreign language approved by the Advisory Committee has been demonstrated, and until the Qualifying Examination has been passed and has been approved by The Graduate School. Students specializing in areas other than the history of the United States must demonstrate competence in a second foreign language before the Qualifying Examination. Students specializing in the history of the United States may, upon the decision of the Advisory Committee, be required to demonstrate competence in a second foreign language or in another skill, such as statistics, computer science, or oral history. In all cases it is the right of the Advisory Committee, not the student, to determine the appropriateness of a foreign language and to decide whether a student specializing in United States history should be required to demonstrate com-

petence in a second foreign language or other skill.

The student's work for the doctorate in history is directed by an Advisory Committee composed of representatives of the areas and fields under four preparation requirements. The committee's chairman directs the dissertation and students should consult this person at their earliest convenience.

Requisites for the Ph.D. candidacy in history will be met as follows:

General Preparation: For the purpose of obtaining a sound factual and interpretative understanding to supplement work in the major field, the student will pursue guided reading, research, and course work in one of the following areas:

- Ancient History (Greek and Roman)
- Early Middle Ages (c.400-c.1000)
- Late Middle Ages (c.1000-c.1500)
- Early Modern Europe (1450-1770)
- Modern Europe (since 1770)
- United States History
- Britain and the Empire (1485 to present)
- Russia and East Europe
- The Far East
- Latin America
- Middle East
- Science and Medicine

As an alternative method of satisfying the area requirement, the student may opt an area titled Western Civilization. This area will require 21 graduate hours of course work at the 500-699 level excluding History 606 but including six hours of Ancient History, six hours of Medieval History, and six hours of European History since 1500 (the last specification possibly including Russian and East European History). None of these hours may be in the student's intensive field.

Intensive Preparation: The student will pursue guided reading, research and course work to obtain professional preparation in depth in two of the following fields, neither of which will duplicate the area chosen for General Preparation:

- Greece
- Rome
- Early Middle Ages(400-1000)
- Late Middle Ages (1000-1500)
- Renaissance and Reformation (to 1648)
- Modern Europe (1600-1770)
- Modern Europe (1770-1870)
- Modern Europe (1870-present)
- United States to 1865
- United States since 1865
- Britain and the Empire, 1485-1815
- Britain and the Empire, 1815 to present
- Russia and East Europe, 1700-1890
- Russia and East Europe, 1890 to present
- Hispanic America since 1810
- History of Science
- History of Medicine

Special Preparation: The student will be prepared in a fourth field. Requirements for this field may be satisfied in one of the following ways:

1. Achieving mastery in a special field chosen from within the student's program of Intensive Preparation. Examples of such a field might be United States intellectual history or the history of Germany. The special field will normally require course work or directed reading in one or more outside disciplines. The choice of the special field will be initiated by the student and the major professor. Final acceptance will rest with the student's Advisory Committee.
2. Achieving competence in some discipline other than history, but in one closely related to the major field of history. Structured programs are available in historic preservation, archives, and communications.

Students' success in their General Preparation will be evaluated by a written examination. Their success in the Intensive and Special Preparations is evaluated by both written and oral examinations.

500	Pre-Classical and Classical Greece.....(3)	540	History of Modern France to 1815.....(3)	616	Readings in History of Science and Medicine since the Renaissance.....(3)
501	Fourth Century Greece and the Hellenistic World.....(3)	541	History of Modern France Since 1815.....(3)	621	Readings in European History 1500-1815.....(3)
502	A History of the Roman Republic.....(3)	542	German History 1815-1914.....(3)	622	Readings in European History 1500-1815.....(3)
503	A History of the Roman Empire.....(3)	543	German History Since 1914.....(3)	623	Readings in European Cultural History since 1815.....(3)
504	Greek and Roman Medicine.....(3)	546	The Byzantine Empire.....(3)	624	Readings in European Political and Diplomatic History since 1815.....(3)
509	Roman Law.....(3)	548	History of the Middle East: 1916-1952.....(3)	625	Readings in British and British Empire History.....(3)
510	Medieval Civilization I.....(3)	549	History of the Middle East: 1952 to Present.....(3)	626	Readings in British and British Empire History.....(3)
511	Medieval Civilization II.....(3)	550	English Constitutional History to 1603.....(3)	630	Readings in American History: The Colonial Era.....(3)
512	Medieval Institutions to the Mid-Tenth Century.....(3)	551	English Constitutional History Since 1603.....(3)	631	Readings in American History: The American Revolution and the New Republic.....(3)
513	Medieval Institutions Since the Mid-Tenth Century.....(3)	552	British Social History During the Tudor-Stuart Period.....(3)	632	Readings in American History: The Age of Jackson, Civil War, and Reconstruction.....(3)
516	Origins of the Scientific World View.....(3)	554	British History 1815-1901.....(3)	633	Readings in American History: The Gilded Age and the Progressive Era.....(3)
517	The Scientific Movement from Galileo to the Present.....(3)	555	British History Since 1901.....(3)	634	Readings in American History: America Since 1920.....(3)
519	The Era of the Renaissance.....(3)	556	The British Empire to 1870.....(3)	635	Readings in Modern Russian History I.....(3)
520	The Era of the Reformation.....(3)	557	The British Empire and Commonwealth after 1870.....(3)	636	Readings in Modern Russian History II.....(3)
521	Europe in the Age of Absolutism.....(3)	558	Canadian History after 1860.....(3)	637	Readings in Latin American History.....(3)
522	The French and European Revolutions, 1760-1815.....(3)	560	Colonial America to 1763.....(3)	638	Readings in Latin American History.....(3)
523	Nineteenth Century Europe.....(3)	561	The American Revolution, 1763-1789.....(3)	639	Readings in East Asian History.....(3)
524	European Diplomacy 1870-1918.....(3)	562	The New Republic, 1789-1820.....(3)	640	Readings in East Asian History.....(3)
525	European Diplomacy Since 1918.....(3)	563	Expansion and Conflict 1820-1860.....(3)	650	Readings in Special Topics in History.....(3)
526	Europe Since World War II.....(3)	564	Civil War and Reconstruction, 1860-1877.....(3)	695	Independent Work.....(1-3)
528	Cultural and Intellectual History of Europe from the Renaissance to the French Revolution.....(3)	565	Emergence of Modern America, 1877-1929.....(3)	700	Special Problems in History.....(3)
529	The Cultural and Intellectual History of Europe Since 1800.....(3)	566	Modern American History from WWI to Pearl Harbor, 1917-1941.....(3)	705	Seminar in Ancient History.....(3)
533	Modern European Imperialism.....(3)	567	Modern American History Since 1941.....(3)	706	Seminar in Medieval History.....(3)
534	Russia in the Twentieth Century I.....(3)	570	Economic History of the United States to 1865.....(3)	710	Seminar in American History, 1607-1815.....(3)
535	Russia in the Twentieth Century II.....(3)	571	Economic History of the United States since 1865.....(3)	711	Seminar in American History, 1815-1865.....(3)
536	Intellectual and Cultural History of Russia and East Europe to 1890.....(3)	572	American Legal History.....(3)	712	Seminar in American History, 1865 to the Present.....(3)
537	Intellectual and Cultural History of Russia and East Europe from 1890 to the Present.....(3)	573	American Constitutional History.....(3)	715	Seminar in Latin American History.....(3)
538	Marxism: The History of Socialism and Communism.....(3)	574	The Diplomacy and Foreign Policy of the United States to 1919.....(3)	720	Seminar in Modern European History, 1500-1714.....(3)
		575	The Diplomacy and Foreign Policy of the United States since 1919.....(3)	721	Seminar in Modern European History, 1714-1870.....(3)
		576	The American Frontier.....(3)	722	Seminar in Modern European History, 1870-.....(3)
		577	The American Frontier.....(3)	729	Dissertation Research.....(0)
		578	History of the Old South.....(3)	768	Residence Credit for the Master's Degree.....(1-6)
		579	History of the New South.....(3)	769	Residence Credit for the Doctor's Degree.....(0-12)
		580	History of Appalachia.....(3)		
		581	U.S. Urban History since 1865.....(3)		
		582	Immigration and American History, 1815 to the Present.....(3)		
		583	Science in American Society.....(3)		
		584	The Rise of Scientific Medicine in the United States.....(3)		
		585	Spain and Portugal in America.....(3)		
		586	Modern Mexico.....(3)		
		587	Modern Venezuela, Colombia, and Latin Caribbean.....(3)		
		588	American Social History to 1865.....(3)		
		589	American Social History since 1865.....(3)		
		590	Japanese History to 1800.....(3)		
		591	Japanese History since 1800.....(3)		
		592	Diplomatic History of East Asia since 1787.....(3)		
		593	East Asian History since World War II.....(3)		
		595	Studies in History.....(3)		
		596	The U.S. Family in Historical Perspective.....(3)		
		606	Historical Criticism.....(3)		
		611	Readings in Ancient History.....(3)		
		612	Readings in Ancient History.....(3)		
		613	Readings in Early Medieval History.....(3)		
		614	Readings in High and Late Medieval History.....(3)		
		615	Readings in History of Science and Medicine Through the Renaissance.....(3)		

Home Economics

The Graduate School rules and regulations for the master's degree apply to the degrees offered in the College of Home Economics. Plan A requires 24 hours plus a thesis except in the Department of FAM which requires 30 hours plus a thesis. Plan B requires 36 hours. No language is required. Because prerequisites vary within

each area, the prospective student is advised to contact the appropriate Director of Graduate Studies, College of Home Economics, University of Kentucky.

For more information about specific departments see that section of the Bulletin which gives a detailed description. The departments are: Family Studies; Human Environment, Design and Textiles; and Nutrition and Food Science. For information about Home Economics Education see Vocational Education.

Horticulture and Landscape Architecture

Graduate Faculty: Professors Thomas R. Kemp, Dean Knavel and A.S. Williams. Associate Professors Jack Buxton, John C. Snyder and Leonard Stolz.

Associate Members: Assistant Professors Douglas D. Archbold, Robert Geneve, Robert Houtz and Leslie Weston. Extension Professors Robert G. Anderson and Robert E. McNiel.

Emeritus Professors: G.W. Schneider and H.C. Mohr.

The department offers graduate work leading to the Master of Science in Agriculture degree. Degrees are awarded primarily under Plan A, but they can be awarded under Plan B with prior approval. The study and research program may relate to pomology, vegetable crops, floriculture, or ornamental horticulture. Research problems are normally related to the discipline of genetics and physiology.

Students interested in working in horticulture toward a Doctor of Philosophy degree may enter the interdepartmental plant physiology or crop science programs.

- 400G Special Topics in Horticulture.....(1-3)
- 510 Vegetable Crop Production.....(3)
- 515 Turf Management.....(3)
- 524 Floriculture.....(3)
- 582 Special Problems in Horticulture.....(1-4)
- 601 Physiological Mechanisms in Horticultural Plants.....(3)
- 732 Mineral Nutrition of Plants.....(3)
- 734 Physiology of Growth and Development... (3)
- 736 Phylogeny of Cultivated Plants.....(3)
- 768 Residence Credit for Master's Degree.....(1-6)
- 770 Seminar.....(1)
- 790 Research in Horticulture.....(1-4)

Human Environment: Design and Textiles

Graduate Faculty: Associate Professor Sharla J. Hoskin.

Associate Members: Associate Professors Deborah D. Brooks, Patrick Snadon, and Terry D. Rothgeb. Assistant Professor Elizabeth Easter.

The Department of Human Environ-

ment: Design and Textiles offers the Master of Arts in Interior Design and the Master of Arts in Textiles and Clothing. Both Plan A, 24 credits plus thesis, and Plan B, 36 credits, are offered.

- 507 Interior Design Studio V: Total Design/Total Function.....(3)
- 508 Interior Design Studio VI: Research/Experimentation/Creativity.....(3)
- 528 Res/Pres I: Introductory Concepts of Restoration and Preservation.....(3)
- 536 En Pro II: Environmental Product Design.....(3)
- 548 Pro/Prac II: Professional Practice and Field Experience.....(3)
- 557 Interior Design Studio 3.....(5)
- 558 Interior Design Studio 4.....(5)
- 568 Interior Design Professional Practice.....(3)
- 569 Computer-Aided Design.....(3)
- 589 Res/Pres I: Introductory Concepts of Restoration and Preservation.....(3)
- 590 Pro/Prac II: Professional Practice and Field Experience.....(3)
- 593 Special Problems in Shelter and Interior Design.....(1-3)
- 599 Special Problems in Shelter and Interior Design.....(1-3)
- 739 Special Problems in Interior Design.....(1-3)
- 768 Residence Credit for the Masters Degree.....(1-6)
- 772 Seminar in Interior Design.....(2)

Library Science

Graduate Faculty: Professors Lawrence A. Allen, Robert E. Cazden, Lois Chan, Michael Harris, Joann V. Rogers and Timothy Sineath. Associate Professor Thomas Waldart.

Emeritus Professor: Laura K. Martin.

Master's Program

The College of Library and Information Science offers a program that conforms to the University of Kentucky Graduate School in offering three forms of the master's degree. Most students elect the MSLS degree which requires 12 hours of core courses, 24 hours of electives, and the final examination. Required core courses are LIS 504, Information in Society; LIS 530, Information Sources and Services; LIS 535, Information Storage and Retrieval; and LIS 560, Management in Library and Information Science.

As many as 9 elective hours may be in a cognate area of study (subject area courses outside library and information science). Fifteen hours of electives must be at the 600 level, and a maximum of 9 hours may be transferred into the program, including any courses taken in post-baccalaureate status.

The M.A. degree Plan A requires all of the above plus satisfactory demonstration of a language competency, a minimum of six

hours in a cognate area, and a thesis which substitutes for six elective hours. The M.A. plan B is the same as plan A in every respect except six hours of advanced bibliography or technical services course work may be substituted for the thesis.

Degree requirements of the program allow students considerable freedom to design the best possible programs for their individual needs. The curriculum is sufficiently varied to permit opportunities to build both breadth and depth into the course of study. The student is assisted in this endeavor by a faculty adviser who provides guidance and counsel. Adviser assignment is based, whenever possible, on student preference.

The program requires 36 hours for the master's degree with 12 of those hours in the core. The other 24 hours are electives chosen by the student in consultation with his adviser. Completion of the 36 hours of course work with an average grade of B or above, together with the satisfactory completion of the final examination, is the general requirement. No student may receive more than two Cs.

- 504 Social Foundations of Librarianship.....(3)
- 504 Information in Society.....(3)
- 510 Children's Literature and Related Materials.....(3)
- 513 Literature and Related Materials for Early Adolescence.....(3)
- 514 Information Resources and Services for Young Adults.....(3)
- 530 Information Sources and Services.....(3)
- 535 Information Storage and Retrieval.....(3)
- 536 Information Needs and Uses.....(3)
- 547 Administration of School Media Centers.....(3)
- 550 Introduction to Cataloging and Classification.....(3)
- 560 Introduction to Library Management.....(3)
- 560 Management in Library and Information Science.....(3)
- 575 Professional Field Experience.....(3)
- 576 School Media Practicum.....(3-12)
- 587 Multi-Media Materials in Libraries.....(3)
- 602 History of Books and Printing to 1800.....(3)
- 603 History of Books and Printing 1800 to the Present.....(3)
- 604 History of Libraries.....(3)
- 605 Introduction to Information Sciences.....(3)
- 606 Information Technology.....(3)
- 608 Methods of Research in Library and Information Science.....(3)
- 609 Current Problems in Library and Information Science.....(3)
- 610 Creative Library Programs for Children.....(3)
- 611 Critical Analysis of Children's Literature.....(3)
- 618 Adult Information Needs and Services.....(3)
- 620 Historical and Analytical Bibliography.....(3)
- 622 Social Science Information.....(3)
- 623 Information in the Humanities.....(3)
- 624 Information in Science and Technology.....(3)
- 626 Government Publication.....(3)

630	Computer-Based Reference Systems and Services.....(3)
635	Information Storage and Retrieval Systems.....(3)
636	Computer Technology in Libraries and Information Centers.....(3)
640	Health Sciences Libraries.....(3)
641	Law Librarianship.....(3)
643	Archives and Manuscripts Management.....(3)
645	Public Libraries.....(3)
646	Academic Libraries.....(3)
647	Current Trends in School Media Centers.....(3)
650	Technical Processing Systems.....(3)
651	Library and Information Networks.....(3)
655	Descriptive Cataloging.....(3)
656	Subject Cataloging and Classification.....(3)
659	Collection Development.....(3)
660	Administrative Behavior in Library Management.....(3)
665	Library Systems Management.....(3)
686	Cataloging and Indexing of Multi-media Materials.....(3)
687	Non-print Media in Libraries.....(3)
690	Special Topics in Library and Information Science.....(3)
695	Independent Study in Library and Information Science.....(3)
768	Residence Credit for the Masters Degree.....((1-6)

Mathematics

Graduate Faculty: Professors David Adams, James C. Beidleman, Craig Benham, James Brennan, J.D. Buckholtz, Richard Carey, Thomas Chapman, Frederick Cohen, Donald Coleman, Paul Eakin, Carl Eberhart, Edgar Enochs, Graeme Fairweather, Steven C. Ferry, Michael Freeman, Michael B. Fugate, Ronald Gariepy, William B. Gragg, Lawrence Harris, Thomas Hayden, Henry Howard, David Johnson, Kenneth Kubota, John Lewis, John Mack, Stephen Milne, Raymond Rishel, David Roselle, Wimberly Royster, Avinash M. Sathaye, Ted Suffridge, Clasiene Van Winter and James H. Wells. Associate Professors Raymond Cox, Kurt Helmes, Robert Jensen, Nicholas Korevaar, Carl W. Lee, Chi-Sing Man, Robert Molzon and James Simpson.

Associate Members: Assistant Professors William J. Harrod and Arthur Heiin Richer.

Joint Appointment: Professor Donald Leigh.

Emeritus Professor: S.M. Shah.

The Department of Mathematics grants the M.A., M.S., M.A.T.M., and Ph.D. degrees. There are no specific course prerequisites for admission; however, two semesters of advanced calculus, and at least one semester each of algebra and topology are suggested.

The Master of Arts degree, designed for prospective junior college and secondary school teachers, is based on a 30 credit-hour program, requires a reading knowledge of one foreign language and is offered under either Plan A or B.

The Master of Science degree, designed for those planning on a mathematical career in business or industry, is based on a 36 credit-hour program which requires course

work in several areas of modern mathematical applications. It is offered under Plan B only; no foreign language is required.

The Master of Arts in Teaching Mathematics degree, designed for persons holding secondary school teaching certificates in mathematics, is based on a 30 credit-hour program. There is no foreign language requirement.

The doctorate is a research degree granted on the basis of broad mathematical knowledge and exhibited creative ability. Course work leading to the doctorate is available in the areas of algebra, analysis (classical and modern), applied mathematics, with specialization in optimization and numerical analysis, differential equations, and topology. A comprehensive examination is required of each student. This examination normally is given after two years of graduate study.

In order to be admitted to candidacy for the degree, a student must pass proficiency examinations in two foreign languages chosen from French, German or Russian, complete studies in a minor field (either inside or outside the department) and successfully complete the comprehensive examinations. Subsequent work becomes highly specialized through seminars, independent study, and finally, work on a dissertation which penetrates in depth some field of particular interest. Areas in which members of the faculty have active research projects include algebraic, general and infinite-dimensional topology, group theory, ring theory, algebraic geometry, number theory, one and several complex variables, rational approximation, operator theory, differential equations, numerical analysis and optimization and control theory.

The ability to communicate mathematics is an increasingly important professional qualification. The department requires all students to complete a teaching or research assignment during each semester of their enrollment in a graduate mathematics program. Students will be assigned to teach courses at the early undergraduate level. Entering students will normally be assigned three semester hours, and continuing ones will normally teach six semester hours. With the approval of the Director of Graduate Studies, a student may substitute an equivalent research effort for the teaching activity.

410G	Mathematics for Economists.....(3)
411G	Models in Mathematical Biology.....(3)
413G	Topics in Mathematics.....(3)
415G	Graph Theory.....(3)
416G	Principles of Operations Research I.....(3)
417G	Principles of Operations Research II.....(3)
432G	Methods of Applied Mathematics I.....(3)
433G	Introduction to Complex Variables.....(3)
441G	Geometry I.....(3)

471G	Advanced Calculus I.....(3)
472G	Advanced Calculus II.....(3)
481G	Differential Equations I.....(3)
483G	Differential Equations II.....(3)
485G	Fourier Series and Boundary Value Problems.....(3)
501	Seminar in Selected Topics.....(3)
502	Seminar in Selected Topics.....(3)
503	Combinatorics.....(3)
504	Fundamentals of Applied Mathematics.....(3)
505	Linear Algebra.....(3)
506	Methods of Theoretical Physics I.....(3)
507	Methods of Theoretical Physics II.....(3)
511	Models in Mathematical Biology-II.....(3)
515	Mathematical Programming and Extensions.....(3)
522	Matrix Theory and Numerical Linear Algebra I.....(3)
527	Applied Mathematics in the Natural Sciences I.....(3)
532	Ordinary Differential Equations.....(3)
533	Partial Differential Equations.....(3)
537	Numerical Analysis.....(3)
538	Numerical Analysis II.....(3)
551	Topology I.....(3)
561	Modern Algebra I.....(3)
565	Linear Algebra.....(3)
566	Theory of Numbers.....(3)
570	Multivariate Calculus.....(3)
571	Analysis I.....(3)
601	Selected Topics in Mathematics.....(3)
602	Topology.....(3)
603	Algebra.....(3)
604	Analysis.....(3)
611	Independent Work in Mathematics.....(3-9)
613	Problems Seminar in Operations Research.....(3)
615	Convex Analysis and Optimization.....(3)
616	Numerical Techniques for Nonlinear Optimization.....(3)
617	Markovian Decision Problems.....(3)
618	Combinatorics and Networks.....(3)
619	Problem Seminar.....(3)
620	Advanced Numerical Analysis.....(3)
621	Advanced Numerical Analysis II.....(3)
622	Matrix Theory and Numerical Linear Algebra II.....(3)
625	Numerical Methods for Differential Equations.....(3)
628	Applied Mathematics in the Natural Sciences II.....(3)
630	Mathematical Foundations of Stochastic Processes and Control Theory I.....(3)
631	Mathematical Foundations of Stochastic Processes and Control Theory II.....(3)
632	Advanced Differential Equations.....(3)
633	Theory of Partial Differential Equations.....(3)
637	Approximation Theory.....(3)
639	Research Projects in Biological Modeling.....(3)
641	Differential Geometry.....(3)
642	Differential Geometry.....(3)
651	Topology II.....(3)
654	Algebraic Topology I.....(3)
655	Algebraic Topology II.....(3)
661	Modern Algebra II.....(3)
667	Group Theory.....(3)
670	Analysis II.....(3)
671	Functions of a Complex Variable I.....(3)
672	Functions of a Complex Variable II.....(3)
673	Several Complex Variables.....(3)
678	Calculus of Variations.....(3)
679	Mathematical Theory of Linear Control Systems.....(3)
681	Functional Analysis I.....(3)
682	Functional Analysis II.....(3)

685	Fourier Analysis.....	(3)
687	Integral Equations.....	(3)
715	Selected Topics in Optimization.....	(3)
721	Selected Topics in Numerical Analysis.....	(3)
732	Selected Topics in Differential and Integral Equations.....	(3)
749	Dissertation Research.....	(0)
751	Selected Topics in Topology.....	(3)
752	Selected Topics in Topology.....	(3)
753	Selected Topics in Functional Analysis.....	(3)
757	Seminar in Topology.....	(3)
761	Homological Algebra.....	(3)
762	Theory of Rings.....	(3)
763	The Theory of Fields.....	(3)
764	Selected Topics in Algebra.....	(3)
765	Selected Topics in Algebra.....	(3)
768	Residence Credit for Master's Degree.....	(1-6)
769	Residence Credit for Doctor's Degree.....	(1-12)
772	Selected Topics in the Theory of Complex Variables.....	(3)
773	Selected Topics in Analysis.....	(3)
774	Selected Topics in Analysis.....	(3)
777	Mathematical Seminar.....	(3)
778	Mathematical Seminar.....	(3)

Mechanical Engineering

Graduate Faculty: Professors L.C. Chow, Clifford Cremers, James Funk, Otfried Hahn, M.C. Roco, Andrew F. Seybert and Shiva N. Singh. Associate Professors Keith Rouch, Peter Sadler, and Kojo Saito.

Associate Members: Assistant Professors M. Pinar Mengue, Amir Nassirharand, Kaveh Taghavi and Horn-Sen Tzou.

Joint Appointment: Professor Ray M. Bowen.

Emeritus Professors: Willis Merle Carter and Orville Stewart.

The Department of Mechanical Engineering provides programs for study and research leading to the Master of Science in Mechanical Engineering and the Doctor of Philosophy.

Areas of concentration for research and study are (1) thermal sciences comprising heat transfer, thermodynamics and fluid mechanics, (2) design, (3) dynamics and mechanical vibrations, (4) nuclear engineering, (5) air pollution, (6) systems and controls and (7) coal science, (8) power systems, (9) combustion, and (10) acoustics.

Graduate study normally requires a bachelor's degree in engineering, not necessarily in mechanical engineering, a GPA of 2.8/4.0 on all undergraduate work and Graduate Record Examination scores of 700 (Quantitative) and 500 (Analytical). An undergraduate degree in chemistry or physics combined with a strong interest in engineering topics is suitable preparation when certain required undergraduate courses are also taken.

The master's degree requires 24 credit hours of course work and a thesis (Plan A). A non-thesis option (Plan B) consisting of

36 credit hours is available to students with acceptable previous research or design experience.

The Ph.D. degree has no formal course requirement, but most students find it necessary to take course work beyond the master's degree as necessary preparation for the qualifying examination. The language requirement for the Ph.D. may be satisfied by either German or Russian.

The department has nine research laboratories. These are the Acoustics Lab, Boiling and Phase Change Lab, Coal Research Lab, Digital Systems Lab, High Temperature and Radiation Lab, Combustion Lab, Nuclear Engineering Lab, and the Mechanical Systems Lab. The department laboratories are well-equipped with instrumentation, computers, and facilities for study in the areas of research in which the department is active.

475G	Introduction to Nuclear Engineering.....	(3)
480G	Thermal Environmental Engineering.....	(3)
501	Mechanical Design with Finite Element Methods.....	(3)
506	Computer-Aided Graphics and Design.....	(3)
510	Dynamics and Design of Robot Manipulations.....	(3)
514	Nuclear Reactor Analysis I.....	(3)
515	Fuel Management and Economics of Nuclear Reactors.....	(3)
517	Instrumentation for Research.....	(3)
529	Applied Fluid Mechanics.....	(3)
530	Gas Dynamics.....	(3)
531	Fluid Dynamics I.....	(3)
540	Analysis and Simulation of Dynamic Systems.....	(3)
541	Elements of Flexible Automation.....	(3)
542	Kinematic Synthesis of Mechanisms.....	(3)
543	Kinematics of Machinery.....	(3)
550	Applications of Heat Transfer.....	(3)
560	Engineering Optics.....	(3)
563	Basic Combustion Phenomena.....	(3)
564	Propulsion System Design.....	(3)
565	Energy Engineering.....	(3)
566	Direct Energy Conversion Processes.....	(3)
567	Air Pollution Engineering and Economics.....	(3)
568	Solar Energy Systems.....	(3)
583	Biotechnology.....	(3)
590	Elements of Aero-Space Technology.....	(3)
599	Topics in Mechanical Engineering (Subtitle Required).....	(3)
601	Advanced CAE Applications.....	(3)
602	Dynamics of Distributed Mechanical Systems.....	(3)
604	Dynamics of Rotating Machinery.....	(3)
610	Engineering Acoustics.....	(3)
620	Advanced Engineering Thermodynamics I.....	(3)
621	Advanced Engineering Thermodynamics II.....	(3)
625	Advanced Heat Conduction.....	(3)
626	Advanced Heat Convection.....	(3)
627	Radiation Heat Transfer.....	(3)
628	Boiling and Condensation.....	(3)
631	Fluid Dynamics II.....	(3)
632	Compressible Fluid Flow.....	(3)
634	Turbulent Flows.....	(3)

640	Advanced Analysis and Simulation of Dynamic Systems.....	(3)
645	Systems Concepts and Analysis.....	(3)
647	System Optimization I.....	(3)
651	System Optimization II.....	(3)
663	Nuclear Reactor Analysis II.....	(3)
664	Experimental Methods in Nuclear Engineering.....	(3)
665	Nuclear Reactor Dynamics.....	(3)
666	Radiation Damage and Shielding.....	(3)
667	Nuclear Reactor Design.....	(4)
685	Biofluid Mechanics.....	(3)
749	Dissertation Research.....	(0)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
780	Special Problems in Mechanical Engineering.....	(3)
781	Special Problems in Bioengineering.....	(3)
783	Topics in Advanced Systems Theory.....	(3)
790	Research in Mechanical Engineering.....	(3)
EGR 537	Numerical Analysis.....	(3)
EGR 599	Topics in Engineering (Subtitle Required).....	(1-3)
EGR 621	Computational Methods in Engineering.....	(3)
EGR 622	Advanced Computational Methods in Engineering.....	(3)
EGR 780	Topics in Engineering (Subtitle Required).....	(1-3)

Microbiology And Immunology

Chair: Alan M. Kaplan

The Department of Microbiology and Immunology provides an interdisciplinary approach to problems concerning the basic molecular and cellular processes of eukaryotic and prokaryotic organisms. The program is designed primarily for doctoral students, however candidates for the master's degree will be accepted under unusual circumstances. The overall research interests of the department are clustered in molecular biology and immunology. Specific research areas include microbial physiology, bacterial pathogenicity, cellular immunology, tumor immunology, lymphocyte differentiation, neuroimmunomodulation, membrane biology, molecular virology, molecular genetics and gene regulation, and involve extensive utilization of the newest techniques in genetic engineering, hybridoma technology and fluorescence activated cell sorting.

The program of study is tailored to the individual background and career goals of the student and stresses an interdepartmental approach both in the selection of courses and in the pursuit of research. Students typically select courses in the Departments of Biochemistry, Pharmacology, Pathology, Biology and Anatomy as well as

Microbiology and Immunology and are encouraged to participate in graduate seminars, journal clubs, research seminars, to interact with visiting scholars and to present the results of their research at local and national meetings.

Financial support is available for highly qualified students. Inquiries regarding graduate level training in Microbiology and Immunology should be directed to the Chairman of the Department of Microbiology and Immunology, University of Kentucky College of Medicine, Lexington, Kentucky, 40536-0084.

494G Immunobiology.....	(3)
512 Cellular Physiology.....	(4)
515 General Cell Biology.....	(3)
595 Immunobiology Laboratory.....	(2)
601 Special Topics in Molecular and Cellular Genetics.....	(1)
611 Biopathology.....	(3)
615 Molecular Biology.....	(3)
685 Advanced Immunobiology.....	(3)
707 Contemporary Topics in Immunology.....	(3)
710 Special Topics in Microbiology.....	(2)
720 Microbial Structure and Function.....	(3)
749 Dissertation Research.....	(0)
768 Residence Credit for Master's Degree.....	(1-6)
769 Residence Credit for the Doctor's Degree.....	(0-12)
772 Seminar in Microbiology.....	(0-1)
798 Research in Microbiology.....	(1-9)

Metallurgical Engineering and Materials Science

Graduate Faculty: Professors Robert J. DeAngelis, Peter P. Gillis, Kenji Okazaki, and Philip J. Reucroft. **Associate Professors** H. Alan Fine and James G. Morris. **Associate Member:** Assistant Professor Todd S. Gross. **Joint Appointment:** Professor Gerald P. Huffman. **Emeritus Professor:** R.E. Swift.

The department offers programs of study leading to the Master of Science in Materials Science and Engineering, and the Doctor of Philosophy. The graduate program in the department has as its aim the development of skills and techniques which are conducive to independent thought, learning and investigation. Degree programs can be selected by the student from a wide variety of topics in the following and other areas: physical metallurgy; mechanical, chemical and electronic properties; metal deformation processing; electron microscopy, X-ray diffraction and surface analysis; metals, ceramics and polymers; extractive metallurgy. Extensive and modern laboratory facilities located in Anderson Hall are available for experimental investigations in these areas.

Preparation for study in this department normally consists of a bachelor's degree in metallurgical engineering. The admission re-

quirement is usually a grade point average of 2.8/4.0 on all undergraduate work. However, an undergraduate degree in chemistry, physics, mathematics or another engineering discipline provides excellent preparation if coupled with a strong interest in the behavior of materials and a willingness to make up some undergraduate courses on a remedial basis.

The master's degree may be obtained by satisfying the usual college requirements. Plan A is preferred. However, students may elect during their first semester of enrollment to substitute six credits of graduate level course work (Plan B) for the thesis. For further information consult the Director of Graduate Studies. There is no language requirement for this degree.

The degree of Doctor of Philosophy is conferred upon candidates who, after completing not fewer than three years of graduate work devoted to study in the broad field of metallurgical engineering and materials science, present a satisfactory thesis, pass a comprehensive examination on their subject and chosen field and show sufficient promise of scholarly attainment. It is intended to represent the achievement of independent and comprehensive scholarship in the field. Reading knowledge of one modern foreign language and demonstrated competence in a minor area from the fields of engineering, mathematics, physical or biological sciences is required for the Ph.D. degree.

The Department of Metallurgical Engineering and Materials Science does not require the candidate to complete a specified number of academic courses. However, a special program is usually recommended by the student's Advisory Committee to fulfill specific needs. Admission to the doctoral program requires the passing of a comprehensive preliminary examination, the nature of which is set by the student's Thesis Advisory Committee.

454G Polymer Engineering.....	(3)
505 Viscoelasticity.....	(3)
506 Mechanics of Composite Materials.....	(3)
531 Powder Metallurgy.....	(3)
535 Mechanical Metallurgy.....	(3)
536 Ceramic Engineering.....	(3)
538 Deformation Processing.....	(4)
541 Advanced Extractive Metallurgy.....	(3)
544 Introduction to Nondestructive Testing.....	(3)
550 Corrosion.....	(3)
551 Advanced Chemical Metallurgy.....	(3)
552 Polymeric Materials.....	(3)
553 Thermodynamics of Polymer Systems.....	(3)
554 Chemical and Physical Processing of Polymer Systems.....	(3)
561 Electric and Magnetic Properties of Materials.....	(3)
580 Material Selection and Failure Analysis.....	(3)
599 Topics in Metallurgical Engineering and Materials Science.....	(2-3)

632 Advanced Materials Science.....	(3)
635 Advanced Mechanical Metallurgy.....	(3)
636 Dislocation Theory.....	(3)
650 Advanced Materials Thermodynamics.....	(3)
659 Advanced Phase Diagrams.....	(3)
661 Advanced Physical Metallurgy I.....	(3)
662 Advanced Physical Metallurgy II.....	(3)
665 Crystallography and X-Ray Metallography.....	(4)
666 Diffraction Methods in Metallurgy.....	(4)
749 Dissertation Research.....	(0)
768 Residence Credit for the Master's Degree.....	(1-6)
769 Residence Credit for the Doctor's Degree.....	(0-12)
771 Seminar.....	(0)
781 Special Problems, Literature and Laboratory.....	(1-3)
782 Special Problems, Literature and Laboratory.....	(3)
EGR 537 Numerical Analysis.....	(3)
EGR 599 Topics in Engineering (Subtitle Required).....	(1-3)
EGR 621 Computational Methods in Engineering.....	(3)
EGR 622 Advanced Computational Methods in Engineering.....	(3)
EGR 780 Topics in Engineering (Subtitle Required).....	(1-3)

Microbiology

Graduate Faculty: Professors Raymond Bridges, Albert T. Brown, Alan Kaplan, Thomas L. Lillich, Thomas L. Roszman, Harold E. Swim and John W. Walsh. **Associate Professors:** Robert B. Calmes Jr., Jeffrey Neal Davidson, Vincent Gallicchio, Marion R. Steiner, Susan C. Straley, and Stephen G. Zimmer.

Associate Members: Associate Professor Thomas C. Gray. **Assistant Professors** Subbarao Bondada, Donald A. Cohen, Susan H. Fisher, Makoto Iwaya, Robert J. Jacob, Timothy Overman, Michael L. Perdue, Charles E. Snow, Mohan L. Sopori and Jerold G. Woodward. **Adjunct Professors** David Mardon and Raymond Otero.

Joint Appointments: Professors M.H. Aleem, Charles T. Ambrose, Lester Goldstein, Judith Lesnaw, Jesse E. Sisken, Ralph Wiseman. **Associate Professors** Jimmie D. Clark and Denny O. Harris.

Emeritus Professors: Professors O.F. Edwards, J.C. Humphries, I. Ruchman, and M. Scherago.

The Microbiology Graduate Program offers courses and research opportunities leading to the Ph.D. degree and M.S. degree (Plans A and B). The program is multidisciplinary and includes faculty from the Colleges of Medicine, Dentistry and Arts and Sciences. The research activities of the faculty are focused in five areas—immunology, molecular genetics-virology, membrane biology, medical microbiology and microbial and cellular physiology. There is in-depth course work in these areas so that the academic program of each student can be tailored to suit his/her specific emphasis. In addition, there are journal clubs, research meetings, student seminars and outside speaker seminar programs to provide both depth and breadth in training.

Financial support is available to qualified students in the forms of research and Uni-

versity fellowships and teaching assistantships as well as support through training and research grants. Inquiries should be addressed to the Director of Graduate Studies, Department of Microbiology and Immunology, University of Kentucky College of Medicine, Lexington, KY 40536. (See course listings in Biology and Medical Microbiology and Immunology.)

Mining Engineering

Graduate Faculty: Professors Joseph Leonard, R.S. Mateer and K.F. Unrug. Associate Professors G.T. Lineberry, Lee W. Saperstein and Andrzej M. Wala.
Emeritus Professor: Fred D. Wright

The program leading to the degrees of Master of Science in Mining Engineering and Doctor of Philosophy is offered through the Department of Mining Engineering. The objectives of this program are to provide an advanced level of applied science for use in the mining industry and to offer specified topics for research specialization. Twenty-four credit hours of course work plus an acceptable thesis (Plan A) or 30 credit hours of course work and reports on several research topics (Plan B) are required to fulfill program requirements.

Enrollment in the M.S. in Min.E. degree program is open to qualified applicants with an undergraduate degree in mining engineering or other engineering and science fields. A grade-point average of 2.8/4.0 is normally required on all undergraduate work. Persons with undergraduate degrees in fields other than mining engineering are required to make up deficiencies in undergraduate mining engineering courses.

It is also required that all applicants for admission must have a combined score on the verbal and quantitative portions of the Graduate Record Examination in excess of 1,000. Foreign applicants whose native language is other than English must take the Test of English as a Foreign Language (TOEFL) and score at least 550 on it before they can be admitted.

In addition to satisfying general Graduate School and College of Engineering admissions requirements (a GPA of 2.8/4.0 on all undergraduate work is normally required), applicants for admission to the M.S. in Min.E., and Ph.D. degree programs in mining engineering must have been awarded a bachelor of science degree from an engineering program accredited by the Accrediting Board for Engineering and Technology, ABET.

The Ph.D. degree has no formal course requirement. Generally students take a number of courses to prepare for the quali-

fying examinations and usually need to spend two years to complete a suitable dissertation. Most students find it necessary to take course work beyond the master's degree as necessary preparation for the qualifying examination. The language requirement for the Ph.D. may be satisfied by either German or Russian.

Current research areas with applications to coal mining include the following: rock mechanics and ground control, operations research, mine ventilation, underground construction, methane drainage, coal preparation, and mineral economics. In addition to the graduate courses in mining engineering, graduate courses in civil engineering and other disciplines may be used to satisfy degree requirements providing they are appropriate to the student's program of study.

Additional information about the graduate program in mining engineering can be obtained by writing the Director of Graduate Studies, Department of Mining Engineering.

490G	Explosives and Blasting Engineering.....	(3)
551	Rock Mechanics.....	(3)
561	Mine Construction Engineering I.....	(3)
562	Mine Design Project.....	(3)
572	Advanced Coal Preparation.....	(3)
581	Mine Valuation.....	(3)
599	Topic in Mining Engineering.....	(2-3)
631	Advanced Mine Systems Engineering.....	(3)
632	Mine Plant Machinery II.....	(3)
633	Advanced Underground Coal Mining Systems.....	(3)
634	Advanced Mine Engineering.....	(3)
636	Advanced Rock Mechanics.....	(3)
637	Rock Slope Stability and Design.....	(3)
641	Advanced Mine Ventilation.....	(3)
661	Mine Construction Engineering II.....	(3)
690	Advanced Mineral Benefication Engineering.....	(3)
749	Dissertation Research.....	(3)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Resident Credit for Doctor's Degree.....	(0-12)
771	Seminar in Mining Engineering.....	(1)
780	Special Problems in Mining Engineering.....	(1-6)
790	Special Research Problems in Mining Engineering.....	(1-9)
EGR 537	Numerical Analysis.....	(3)
EGR 599	Topics in Engineering (Subtitle Required).....	(1-3)
EGR 621	Computational Methods in Engineering.....	(3)
EGR 622	Advanced Computational Methods in Engineering.....	(3)
EGR 780	Topics in Engineering (Subtitle Required).....	(1-3)

School of Music

Graduate Faculty: Professors Joseph Baber, Carl W. Guempel, Hubert Henderson, Alan Hersh, Rey M. Longyear, Lucien Stark, and Robert L. Weaver.

Associate Professors Lance Brunner, Kate Covington, Richard C. Domek, Jonathan Glixor, Allen W. Goodwin, Mina F. Miller, Ronald P. Monsen, Schuyler Robinson and Celia H. Wang.

Associate Members: Associate Professors Charles Lord and Patricia Montgomery. Assistant Professors Jean Christensen, Margaret A. Kennedy and David Warren Sogin.

Emeritus Professors: R. Bernard Fitzgerald, Donald Ivey, Wesley K. Morgan, Nathaniel Patch and Kenneth Wright.

The School of Music offers the Master of Arts (M.A.) in musicology or theory; Master of Music (M.M.) in performance, theory, composition, or music education; Doctor of Musical Arts (D.M.A.) in performance or composition; and the Doctor of Philosophy (Ph.D.) in musicology, music education or theory. The applicant for the master's degree is expected to have earned an appropriate undergraduate degree at the University of Kentucky or an equivalent degree from a comparable institution.

Entrance Requirements

Placement examinations in theory, music history and literature, and the proposed field of specialization are required of all applicants before admission to graduate programs in music. Graduates of, or students currently enrolled at the University of Kentucky, are not exempt from this requirement. Those seeking a degree in performance must audition as well. Entrance examinations and auditions are held three times each year for those wishing to enroll the following fall semester: the last Saturday of January, and the second Saturday of March and July. For those wishing to enroll in the spring semester, examinations and auditions will be held the second Saturday in November. *The Director of Graduate Studies must be notified at least four weeks in advance of the date chosen by the applicant.*

Note: Persons not applying for financial assistance may choose any of the above dates. Persons applying for Non-Service Fellowships must take the examinations (and the audition if applicable) on the last Saturday of January. Those applying for teaching assistantships may choose the last Saturday of January or the second Saturday of March. Those wishing to begin studies during a summer session must take the examinations no later than the second Saturday of March.

In cases of extreme hardship, arrangements may be made with the Director of Graduate Studies to take entrance examinations **in absentia** and to send audition tapes. (Does not apply to D.M.A. candidates.)

GENERAL REQUIREMENTS FOR MASTER'S DEGREE

Foreign Language Requirements. The Master of Arts degree requires a reading knowledge of one foreign language, preferably French or German. Voice majors must have completed one year of study in each of two modern foreign languages.

Thesis Requirements. The Master of Arts degree requires a thesis (Plan A: see general requirements). For the Master of Music degree in Performance, a public recital acceptable to the faculty is required in lieu of a thesis for the Master of Music degree in Performance. For the Master of Music degree in Composition, a composition of major proportions, acceptable to the composition-theory faculty and publicly performed, must be submitted in lieu of a thesis by candidates. A thesis is optional (Plan A or Plan B) in the Master of Music in Music Education or Theory. Twenty-four hours are required with a thesis or 30 hours without a thesis.

A final comprehensive examination is required for each program.

MASTER OF ARTS

Prerequisites: A suitable background in music literature and music theory, and a reading knowledge of one foreign language, normally French or German.

MASTER OF ARTS (MUSICOLOGY EMPHASIS)

Music History and Literature.....	9-12
Theory (including MUS 671).....	5-8
Research Methods (MUS 618).....	3
Directed Electives.....	2-8
Thesis.....	0
Total	24

MASTER OF ARTS (THEORY EMPHASIS)

Theory (including MUS 671 and MUS 672).....	9-12
Music History and Literature.....	6-8
Research Methods (MUS 618).....	3
Directed Electives.....	2-8
Thesis.....	0
Total	24

MASTER OF MUSIC (THEORY)

Prerequisites: Ten hours of upper division theory, including form and analysis and counterpoint, or the equivalent.

Theory (including MUS 578 or 671 or 672).....	10
Research Methods (MUS 618).....	3
Music History and Literature.....	6
Pedagogy of Theory (674,675).....	4
Directed Electives.....	1-7
Thesis (if desired).....	0
Total	24-30

The student may either prepare a thesis or take six additional hours of theory, composition, or music history and literature courses for a total of 30 hours of course work.

MASTER OF MUSIC (COMPOSITION)

Prerequisites: Submission of three original compositions.

Advanced Composition (MUS 673).....	4
Music History and Literature.....	6
Theory (including MUS 578 or 671 or 672).....	8
Directed Electives.....	6
Thesis Composition.....	0
Total	24

The thesis composition must be publicly performed. The student is responsible for the preparation of legible score and parts.

MASTER OF MUSIC (PERFORMANCE)

Prerequisites: Acceptance by the appropriate faculty of applied music.

Music Performance (including recital).....	9
Music History and Literature.....	6
Theory (including MUS 578 or 671 or 672).....	4
Directed Electives.....	11
Recital.....	0
Total	30

This degree program is offered in the following areas: piano, voice, organ, violin, viola, cello, flute, oboe, clarinet, bassoon, trumpet, French horn, trombone, baritone, tuba, saxophone and percussion.

Wind and string majors must participate in at least one University-sponsored performing organization for two semesters. A minimum of three full semesters, excluding summer sessions, is necessary for an M.M. in Performance.

MASTER OF MUSIC (MUSIC EDUCATION)

History and Philosophy of Music Education (MUS 751).....	3
Supervision and Administration of School Music (MUS 750).....	3
Music Education Electives.....	6
Music Performance.....	6
Major Instrument.....	1-2
Minor Instrument.....	1-2
Research Methods (MUS 617).....	3
Music History and Theory (including MUS 578 or 671 or 672).....	6
Electives in Music or Education.....	3
Total	30

Plan II*

History and Philosophy of Music Education (MUS 751).....	3
Supervision and Administration of School Music (MUS 750).....	3
Music Education Electives.....	6
Music Performance.....	3
Research Methods (MUS 617).....	3
Theory (including MUS 578 or 671 or 672).....	4
Music History and Literature.....	6
Electives.....	2
Total	30

Plan III*

History and Philosophy of Music Education (MUS 751).....	3
Supervision and Administration of School Music (MUS 750).....	3
Music Education Electives.....	3
Music Performance.....	3
Research Methods (MUS 617).....	3
Music History and Theory (including MUS 578 or 671 or 672).....	6
Electives.....	3
Thesis.....	0
Total	24

*Students planning to earn the doctorate in Music Education should elect Plan II or III.

Each full-time resident graduate student in music education must participate in a University-sponsored performing organization for two semesters.

DOCTOR OF MUSICAL ARTS DEGREE

The Doctor of Musical Arts program offers opportunity for fullest development as a performer, composer, or teacher of music performance or composition.

Applicants for the program in performance should have had at least two years' teaching experience. One foreign language, normally French or German, is required for all D.M.A. students.

One lecture-recital and three formal recitals are required for performance majors. The program content of the recitals will be established in cooperation with the student's Advisory Committee. With its approval, a program of chamber music, a concerto performance with orchestra, or a major role in an opera or oratorio may fulfill the requirement for one of the recitals. In lieu of a dissertation, a doctoral project will be required as an indication of the student's ability for scholarly study and research. This requirement will be fulfilled by performers with (1) a monograph which forms the basis of the lecture-recital, and (2) thoroughly researched and documented program notes for the remaining repertoire used in fulfilling the performance requirements, such monographs and notes to be approved by the Advisory Committee.

Composers will submit for the approval of the Advisory Committee a large-scale composition and will be responsible for arranging for its public performance. In lieu of a dissertation, they will submit an in-depth analysis and discussion of their composition.

The minimum course requirements beyond the master's degree are as follows:

MUS 618 Research Methods*.....	3
Music History and Literature.....	9
Advanced Music Theory.....	6
Performance Major.....	12
Minor(optional)**.....	9
Total:	30-39

*If not completed at the master's level.

**The minor may be taken within or outside the School of Music, and is subject to the approval of the Advisory Committee and the chairman of the department concerned.

DOCTOR OF PHILOSOPHY DEGREE IN MUSIC

The School of Music offers courses and research opportunities leading to the Ph.D. in music. Applicants must meet the entrance requirements of The Graduate School as well as those of the School of Music, and must show evidence of competence in musical performance. Applicants with master's degrees must submit a thesis or a research paper of sufficient scope and quality to demonstrate

competence in research and clarity of expression. The basic core requirements are:

- Research Methods: MUS 618 (if not taken at the master's level)
- Music History and Literature: 9 hours beyond the master's
- Advanced Music Theory: 6 hours beyond the master's
- Three seminars (minimum) beyond the master's
- There is no specific requirement in a minor area, but such work may be required by a student's Advisory Committee if it is essential to the major research or field of concentration.
- Language requirements will conform to The Graduate School policy; however, specific languages required will vary with individual options.
- The student must display proficiency at the keyboard.

The Ph.D. in music may be pursued in one of three areas: music education, music theory, or musicology. The program for each area beyond the core requirements is given below.

MUSIC EDUCATION

- Music in Higher Education (MUS 762)
- Psychology of Music (MUS 770)
- At least one graduate level course in statistics
- A knowledge of acoustics (PHY 140 or equivalent), a knowledge of specialized research in music education (MUS 617 or equivalent). These requirements must be met by the end of the first year of doctoral study.
- Additional courses in music education or adjunct subjects as recommended by the Advisory Committee.
- A reading knowledge of French, German, or a language appropriate to the research interest.

MUSIC THEORY

- Pedagogy of Theory (MUS 674)
- Advanced Pedagogy and Theoretical Systems (MUS 675)
- History of Music Theory (MUS 678)
- Additional courses in music theory or adjunct subjects as recommended by the Advisory Committee
- A reading knowledge of French, German, or a language appropriate to the research interest

MUSICOLOGY

- Medieval Notation (MUS 700)
- Renaissance Notation (MUS 701)
- Additional courses in musicology or adjunct subjects as recommended by the Advisory Committee
- A reading knowledge of at least two foreign languages, normally German and either French or Italian.
- In all cases, the foreign language requirement(s) must be met by the end of the first

full year of study in the Ph.D. program. The student's Advisory Committee must be formed and appointed by the Dean of The Graduate School prior to advance registration for the student's third semester. The dissertation topic and prospectus must be approved by the Advisory Committee; the dissertation itself must be the result of original research which adds to or modifies what has previously been known on the subject. Qualifying Examinations must be taken no later than one semester after the completion of course work. A student is admitted to candidacy for the Ph.D. degree only after the language requirement(s) have been met and the Qualifying Examinations have been passed.

JOINT Ph.D. IN MUSICOLOGY University of Kentucky and University of Louisville

A joint Ph.D. in Musicology is available from the University of Kentucky and the University of Louisville. The faculties and facilities of both universities are available to students on either campus. If the student is enrolled full-time at either university, courses from the other are available without charge.

Students interested in this program should contact the Associate Dean of the Graduate School, University of Louisville, or the Director of Graduate Studies at the University of Kentucky, School of Music, for further information. The general regulations for doctoral students at the University of Kentucky will apply.

Admission. Every applicant must be admitted to the graduate schools of BOTH universities. Official transcripts and GRE scores for students admitted to the University of Louisville will be sent to the Director of Graduate Studies, School of Music, University of Kentucky by the Graduate School, University of Louisville. Applicants may be admitted provisionally on the recommendation of the Director of Graduate Studies in Music at the University of Kentucky pending receipt of GRE scores and/or completion of placement examination at the University of Louisville.

Language Requirements. The University of Louisville will notify the Director of Graduate Studies, University of Kentucky, that a student has completed the language requirements.

Residence Requirements. At least three regular courses must be taken at the University of Kentucky. Residence requirements may be satisfied at the University of

Louisville, University of Kentucky, or a combination of both. A student must be in residence as a full-time student or the equivalent for a minimum of four semesters beyond the master's degree. At least two of these semesters must be consecutive and precede the qualifying examination.

The University of Louisville will notify the Director of Graduate Studies, University of Kentucky, of the intent to schedule the qualifying examination and confirm that the student meets prequalifying requirements. Each candidate for the doctorate must complete two semesters of full-time dissertation study immediately after the qualifying examination by registering for a total of 18 credit hours in MUS 769 (University of Kentucky) or Music History 769 (University of Louisville). The candidate must maintain candidacy by registering for MUS 769 or Music History 769 (zero credit) each semester thereafter until the dissertation is successfully defended.

Advisory Committee. The Advisory Committee will be composed of six graduate faculty members, three from each institution.

Further information may be obtained from the University of Louisville Graduate School Bulletin.

MUSIC PERFORMANCE COURSES

All music performance courses (MUP) may be repeated three times for credit.

All music performance courses carry from one to four credits during the fall and spring semesters. (Applied music offerings during the summer are limited.)

501	Piano.....	(1-4)
502	Voice.....	(1-4)
503	Organ.....	(1-4)
504	Violin.....	(1-4)
505	Viola.....	(1-4)
506	Cello.....	(1-4)
507	String Bass.....	(1-4)
508	Flute.....	(1-4)
509	Oboe.....	(1-4)
510	Clarinet.....	(1-4)
511	Bassoon.....	(1-4)
512	Trumpet.....	(1-4)
513	French Horn.....	(1-4)
514	Trombone.....	(1-4)
515	Baritone.....	(1-4)
516	Tuba.....	(1-4)
517	Saxophone.....	(1-4)
518	Percussion.....	(1-4)
519	Harp.....	(1-4)
520	Harpsichord.....	(1-4)
522	Historical Instruments.....	(1-4)
523	Classical Guitar.....	(1-4)
558	Conducting.....	(1-4)
601	Piano.....	(1-4)
602	Voice.....	(1-4)
603	Organ.....	(1-4)
604	Violin.....	(1-4)
605	Viola.....	(1-4)
606	Cello.....	(1-4)

607	String Bass.....	(1-4)
608	Flute.....	(1-4)
609	Oboe.....	(1-4)
610	Clarinet.....	(1-4)
611	Bassoon.....	(1-4)
612	Trumpet.....	(1-4)
613	French Horn.....	(1-4)
614	Trombone.....	(1-4)
615	Baritone.....	(1-4)
616	Tuba.....	(1-4)
617	Saxophone.....	(1-4)
618	Percussion.....	(1-4)
619	Harp.....	(1-4)
620	Harpichord.....	(1-4)
622	Historical Instruments.....	(1-4)
623	Classical Guitar.....	(1-4)
658	Conducting.....	(1-4)
701	Piano.....	(1-4)
702	Voice.....	(1-4)
703	Organ.....	(1-4)
704	Violin.....	(1-4)
705	Viola.....	(1-4)
706	Cello.....	(1-4)
708	Flute.....	(1-4)
709	Oboe.....	(1-4)
710	Clarinet.....	(1-4)
711	Bassoon.....	(1-4)
712	Trumpet.....	(1-4)
713	French Horn.....	(1-4)
714	Trombone.....	(1-4)
716	Tuba.....	(1-4)
717	Saxophone.....	(1-4)
718	Percussion.....	(1-4)
MUC 570	Advanced Chamber Music Ensemble.....	(1)
MUC 596	Opera Workshop.....	(1-3)
MUC 675	Jazz Ensemble.....	(1)
MUC 689	Wind Ensemble.....	(1)
MUC 691	Orchestra.....	(1)
MUC 692	University Choristers.....	(1)
MUP 501	Piano.....	(1-4)
MUP 502	Voice.....	(1-4)
MUP 503	Organ.....	(1-4)
MUP 504	Violin.....	(1-4)
MUP 505	Viola.....	(1-4)
MUP 506	Cello.....	(1-4)
MUP 507	String Bass.....	(1-4)
MUP 508	Flute.....	(1-4)
MUP 509	Oboe.....	(1-4)
MUP 510	Clarinet.....	(1-4)
MUP 511	Bassoon.....	(1-4)
MUP 512	Trumpet.....	(1-4)
MUP 513	French Horn.....	(1-4)
MUP 514	Trombone.....	(1-4)
MUP 515	Euphonium.....	(1-4)
MUP 516	Tuba.....	(1-4)
MUP 517	Saxophone.....	(1-4)
MUP 518	Percussion.....	(1-4)
MUP 519	Harp.....	(1-4)
MUP 520	Harpichord.....	(1-4)
MUP 521	English Horn.....	(1-4)
MUP 522	Historical Instruments.....	(1-4)
MUP 523	Classical Guitar.....	(1-4)
MUP 524	Conducting.....	(1-4)
MUP 601	Piano.....	(1-4)
MUP 602	Voice.....	(1-4)
MUP 603	Organ.....	(1-4)
MUP 604	Violin.....	(1-4)
MUP 605	Viola.....	(1-4)
MUP 606	Cello.....	(1-4)
MUP 607	String Bass.....	(1-4)
MUP 608	Flute.....	(1-4)
MUP 609	Oboe.....	(1-4)
MUP 610	Clarinet.....	(1-4)
MUP 611	Bassoon.....	(1-4)
MUP 612	Trumpet.....	(1-4)
MUP 613	French Horn.....	(1-4)

MUP 614	Trombone.....	(1-4)
MUP 615	Euphonium.....	(1-4)
MUP 616	Tuba.....	(1-4)
MUP 617	Saxophone.....	(1-4)
MUP 618	Percussion.....	(1-4)
MUP 619	Harp.....	(1-4)
MUP 620	Harpichord.....	(1-4)
MUP 622	Historical Instruments.....	(1-4)
MUP 623	Classical Guitar.....	(1-4)
MUP 658	Conducting.....	(1-4)
MUP 701	Piano.....	(1-4)
MUP 702	Voice.....	(1-4)
MUP 703	Organ.....	(1-4)
MUP 704	Violin.....	(1-4)
MUP 705	Viola.....	(1-4)
MUP 706	Cello.....	(1-4)
MUP 708	Flute.....	(1-4)
MUP 709	Oboe.....	(1-4)
MUP 710	Clarinet.....	(1-4)
MUP 711	Bassoon.....	(1-4)
MUP 712	Trumpet.....	(1-4)
MUP 713	French Horn.....	(1-4)
MUP 714	Trombone.....	(1-4)
MUP 716	Tuba.....	(1-4)
MUP 717	Saxophone.....	(1-4)
MUP 718	Percussion.....	(1-4)
MUS 500	Music of the Middle Ages.....	(3)
MUS 501	Music of the Renaissance.....	(3)
MUS 502	Music of the Baroque Era.....	(3)
MUS 503	Music of the Classic Period.....	(3)
MUS 504	Music of the Nineteenth Century.....	(3)
MUS 505	Music of the Twentieth Century.....	(3)
MUS 506	History of American Music.....	(3)
MUS 520	Vocal Solo Literature.....	(3)
MUS 521	Organ Literature.....	(3)
MUS 522	Piano Literature to 1830.....	(3)
MUS 523	Piano Literature Since 1830.....	(3)
MUS 524	String Literature.....	(3)
MUS 530	Collegium Musicum.....	(1-3)
MUS 550	Topics in Music Education (Subtitle Required).....	(3)
MUS 565	Vocal Pedagogy.....	(2)
MUS 566	Piano Pedagogy.....	(3)
MUS 568	General Music in the Secondary School.....	(2)
MUS 570	Orchestration.....	(2)
MUS 571	Orchestration.....	(2)
MUS 572	Counterpoint.....	(3)
MUS 573	Counterpoint.....	(3)
MUS 574	Composition.....	(2)
MUS 575	Composition.....	(2)
MUS 578	Analysis and Style Survey.....	(3)
MUS 617	Research Methods.....	(3)
MUS 618	Research Methods.....	(3)
MUS 620	Advanced German Vocal Repertory.....	(3)
MUS 621	Advanced Vocal Repertory.....	(3)
MUS 622	Symphonic Literature.....	(3)
MUS 623	Opera Literature.....	(3)
MUS 624	Chamber Music Literature.....	(3)
MUS 625	Choral Literature.....	(3)
MUS 650	Music Education Workshop.....	(1-4)
MUS 660	Advanced Music Education Methods and Materials (Subtitle Required).....	(2)
MUS 670	Musical Style I.....	(3)
MUS 671	Musical Style II.....	(3)
MUS 672	Musical Style III.....	(3)
MUS 673	Advanced Composition.....	(2)
MUS 674	Pedagogy of Theory.....	(2)
MUS 675	Pedagogy of Theory.....	(2)
MUS 677	Contemporary Music Idioms.....	(3)
MUS 678	History of Theory.....	(3)
MUS 690	Topics in Musicology (Subtitle Required).....	(3)
MUS 700	Medieval Notation.....	(3)
MUS 701	Renaissance Notation.....	(3)

MUS 702	Seminar in Musicology.....	(3)
MUS 718	Doctoral Seminar.....	(3)
MUS 719	Independent Work in Musicology.....	(1-3)
MUS 749	Dissertation Research.....	(0)
MUS 750	Administration and Supervision of Public School Music.....	(3)
MUS 751	History and Philosophy of Music Education.....	(3)
MUS 762	Music in Higher Education.....	(3)
MUS 766	Seminar in Music Education.....	(3)
MUS 767	Independent Work in Music Education.....	(1-3)
MUS 768	Residence Credit for the Master's Degree.....	(1-6)
MUS 769	Residence Credit for Doctor's Degree.....	(0-12)
MUS 770	Psychology of Music.....	(3)
MUS 772	Seminar in Theory.....	(3)
MUS 799	Independent Work in Music Theory.....	(1-3)

Nursing

Graduate Faculty: Professors Juanita Fleming, Margaret Grier, and Carolyn Williams. Associate Professor Dorothy Brockopp, Norma J. Christman and Barbara A. Sachs.

Associate Members: Professor Melva J. Hendrix. Associate Professors Gretchen LaGodna, Gwendolen Lee, Dorothy Luther, Sharon L. Sheahan, Marcia Stanhope, and Mary K. Walker. Assistant Professors Kathleen Blomquist and Lynne Hall.

Joint Appointment: Associate Professor John F. Wilson.

Emeritus Professors: Loretta Denman, Virginia Lane and Marion McKenna.

The College of Nursing offers programs of study leading to the degrees, Master of Science in Nursing and Doctor of Philosophy.

The Master of Science in Nursing program prepares nurses for the advanced practice of nursing in a particular specialty. The program is designed to build on the first professional degree; nursing theory, research, and practice are emphasized. Areas of study are: (a) Adult Nursing, focusing upon the care of adults across the life span, with areas of concentration in critical care, adult, and gerontological nursing; (b) Community Health Nursing/Administration which prepares nurses to assume positions in community-based agencies delivering health and nursing care services to specific populations as primary care nurse practitioners or as nurse managers; (c) Parent-Child Nursing focusing upon families and parenting practices, with components in parent-child nursing, neonatal nursing, and nurse-midwifery; (d) Psychiatric/Mental Health Nursing focusing upon preparation for the role of clinical specialist in psychiatric/mental health nursing practice, including adult psychiatric, gero-psychiatric/mental health nursing, and substance abuse.

Applicants to the master's degree program must meet the minimum requirements of The Graduate School, and are expected to

take the Graduate Record Examination prior to acceptance in the program. The minimal combined score of 800 on the verbal and quantitative portions of the Graduate Record Examination is acceptable. The minimal grade point average is 2.5 on a 4.0 grading scale. Graduation from a National League for Nursing accredited baccalaureate degree program, current nurse licensure, one year of experience as a nurse after receiving the baccalaureate degree in nursing, three references, and an interview are required. Applicants selecting the nurse-midwifery concentration are required to have two years of relevant experience in nursing (post-baccalaureate degree in nursing) prior to the application deadline.

The Master of Science in Nursing degree requires a minimum of 34 credit hours of course work. Some specialties may require more. All students are required to take at least 20 credits in advanced clinical nursing, concepts and theories in nursing, and nursing research. Students may elect to prepare for functional roles in teaching and mid-level management in nursing. In addition, each student must complete a research project or thesis, and pass a final comprehensive examination. Students may pursue part-time study through flexible scheduling and selected evening courses. The College also offers an outreach program in cooperation with Morehead State University, Northern Kentucky University, Western Kentucky University, and the Frontier Nursing Service.

The Doctor of Philosophy in Nursing program prepares nurse scholars to contribute to the development of nursing science through clinical research and the application of knowledge to nursing practice. Graduates assume roles in research, administration, and education. Course work focuses on the development and testing of nursing theory and the acquisition of skills and experience in clinical research. The major research areas are in Adult Nursing, Community Health Nursing, Parent and Child Nursing, and Psychiatric/Mental Health Nursing.

Applicants to the doctoral program must meet the minimum requirements of The Graduate School as well as the following requirements of the nursing program. An applicant must possess a master's degree in nursing from a National League of Nursing accredited school and a 3.3 or higher grade point average on a 4.0 scale for all master's level work. Applicants must submit scores on the verbal and quantitative portions of the Graduate Record Examination; a minimum combined score of 1,000 is required. Applicants must have a minimum of two years post-baccalaureate experience. A per-

sonal interview and three references are required.

The Doctor of Philosophy degree in nursing requires a minimum of 47 credit hours of course work beyond the master's degree, plus 18 hours of residence credit for dissertation research. A written and oral examination is required to qualify as a degree candidate. The student must engage in two semesters of full-time study (9 credit hours) prior to the qualifying examination. Also required is a reading knowledge of a foreign language in addition to the dissertation.

520	Special Topics in Nursing (Subtitle Required).....	(2-4)
543	Gerontologic Nursing.....	(3)
550	Nursing Perspectives: Current Health Care Problems and Issues.....	(3)
560	Nursing Management of Exceptional Children.....	(3)
561	Concepts of Nursing Administration.....	(3)
610	Concepts and Theories in Nursing.....	(3)
612	Systematic Inquiry in Nursing.....	(3)
614	Practicum in Clinical Nursing I.....	(2-4)
615	Practicum in Clinical Nursing II.....	(2-4)
616	Practicum in Clinical Nursing III.....	(2-4)
619	Teaching in Nursing.....	(3)
620	Problems in Clinical Nursing.....	(2-6)
621	Clinical Specialists: Roles and Functions in Nursing.....	(3)
622	Nursing Administration.....	(3)
623	Practicum in Clinical Teaching of Nursing.....	(1-4)
627	Practicum in Nursing Administration.....	(1-4)
628	Historical and Contemporary Perspectives in Community Health Nursing Practice.....	(3)
650	Physical and Health Assessment.....	(4-6)
651	Diagnostic Laboratory Procedures.....	(1)
654	Identification and Management of Common Health Problems I.....	(3)
655	Identification and Management of Common Health Problems II.....	(3)
656	Health Problems of the Pediatric Client.....	(2)
660	Basic Nurse-Midwifery I.....	(6)
662	Family Nurse Clinical Practicum I.....	(4)
662	Primary Care Nurse Practitioner Clinical Practicum I.....	(3)
670	Basic Nurse-Midwifery II.....	(6-9)
672	Family Nurse Clinical Practicum II.....	(4)
672	Primary Care Nurse Practitioner Clinical Practicum II.....	(3)
682	Family Nurse Internship.....	(6)
688	Developing and Testing Nursing Knowledge in Clinical Field I.....	(3)
689	Developing and Testing Nursing Knowledge in Clinical Field II.....	(3)
749	Dissertation Research.....	(0)
758	Family Assessment, Health Teaching, and Clinical Counseling in Nursing.....	(2)
759	Seminar in Health Promotion and Nursing Practice.....	(2)
768	Residence Credit for Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
770	Seminar in Clinical Nursing I.....	(2)
771	Seminar in Clinical Nursing II.....	(2)
772	Seminar in Primary/Ambulatory Care.....	(2)
774	Seminar in Nursing Research.....	(2)
778	Proseminar in Contemporary Health and Nursing Policy Issues.....	(3)
779	Dissertation Seminar.....	(3)
780	Seminar in Nurse-Midwifery.....	(2)
781	Independent Study in Nursing.....	(1-3)

790	Theory Development and Research in Nursing I.....	(3)
791	Theory Development and Research in Nursing II.....	(3)
792	Theory Development and Research in Nursing III.....	(3)

Nutrition and Food Science

Graduate Faculty: Professors Linda Chen, Ching K. Chow.

Associate Members: Associate Professor David S. Newburg. Assistant Professors Howard Glauert, Bernhard Henning, Mary A. Stuart and Sharon Wallace. Extension Professor Fudeko T. Maruyama. Extension Associate Professor Darlene Forester.

Joint Appointments: Professor M.H. Aleem. Associate Professor Sara Quandt.

Emeritus Professors: Abby L. Marlatt and Leonard Pockett.

Graduate majors in nutrition, food science and dietetics lead to the degree of Master of Nutritional Sciences. For more information see Home Economics.

503	Community Nutrition.....	(3)
504	Food Science Research.....	(3)
508	Seminar in Nutrition.....	(1)
510	Advanced Nutrition.....	(3)
511	Therapeutic Nutrition.....	(3)
514	Food Preservation.....	(3)
516	Maternal and Child Nutrition.....	(3)
517	Food for Special Occasions.....	(3)
542	Institution Equipment.....	(3)
546	Institution Organization and Management.....	(3)
548	Institution Administration.....	(3)
560	Food and the Consumer.....	(3)
590	Field Work in Nutrition.....	(1)
591	Special Problems in Foods and Nutrition.....	(1-3)
594	Special Problems in Institution Management.....	(1-3)
601	Research Methodology in Nutritional Sciences.....	(3)
603	Advanced Community Nutrition.....	(3)
610	Human Nutrition: Assessment.....	(3)
620	Protein and Amino Acids in Human Nutrition.....	(3)
660	Food Toxicology.....	(3)
680	Nutrition and Aging.....	(2)
685	Mineral Metabolism.....	(2)
768	Residence Credit for the Masters Degree.....	(1-6)
771	Seminar in Nutrition and Food Science.....	(1)
772	Current Topics in Human Nutrition and Food Science.....	(2)
781	Special Problems in Foods and Nutrition.....	(1-3)
784	Special Problems in Institution Management.....	(1-3)

Operations Research

Director of Graduate Studies: Carl Lee

The mathematical modeling of social, industrial, and military systems and the selection of preferred alternatives among many

possibilities is the subject of Operations Research. The ever-increasing complexity and magnitude of the decision problems confronting modern decision-makers demand the availability of a pool of experts capable of providing professional competence in the design, analysis and optimization of large-scale systems.

The Master of Science in Operations Research is designed to equip the student with the professional competence necessary for the implementation of operations research techniques in decision problems arising in management, engineering, education, bio-sciences, etc. The curriculum consists of core courses in deterministic optimization, stochastic aspects of operations research including statistical decision making, stochastic processes and stochastic optimization, one course in computer science either in the area of programming languages or the area of large data base handling, and one problem seminar designed to integrate the material in the specific topic courses as well as involve the participant in some very specific operations research project.

In addition, the student must select a minor in an application-oriented area. This minor consists of a minimum of two courses in such departments as economics, business administration, accounting, engineering, agriculture, and biology.

CURRICULUM

Core Courses

Deterministic Optimization

- OR 515 Mathematical Programming and Extensions
- OR 616 Numerical Techniques for Nonlinear Optimization
- OR 618 Combinatorics and Networks

Stochastic Models

- OR 524 Probability Theory
- OR 525 Introductory Statistical Inference
- OR 624 Applied Stochastic Processes
- OR 617 Markovian Decision Problems

Computer Science

The student should be well acquainted with computer programming and be competent in one procedural language and in a symbol manipulation language. In addition, the student must complete either a survey course (CS 460G) or a more advanced computer science course on information processing depending on the student's background and interest. Examples are:

- CS 540 System Simulation
- CS 605 Advanced Information Processing

Problem Seminar

- OR 619 Problem Seminar in Operations Research

Minor Requirement

The student must select a minor area of specialization with the approval of the director of the program. The minor will consist of a minimum of two courses at the 500 level or above. The goal is to enable the student

to converse directly with some of the prospective users of his/her skills.

Electives

Electives must be selected with the approval of the Director of Graduate Studies. There are many course offerings in mathematics, statistics, computer science, economics, electrical engineering, mechanical engineering, civil engineering, business administration, and agricultural economics which are related to specific aspects of operations research. (The completion of deficiencies or prerequisites cannot be counted as credits toward the degree requirement and thus are not considered to be electives.)

Admissions and Degree Requirements

The entering student is expected to have a strong working knowledge of linear algebra and to have had some experience with methods of proof used in mathematics. Each entering student, in addition, must have a sufficient background in at least one of the minor areas so that the prerequisites to the courses offered in that area can be met.

The usual Graduate School requirements for admission will be supplemented by a one-semester advanced calculus course, a one-semester junior-senior level course in linear algebra, and a familiarity with programming a digital computer. Lack of these prerequisites will be considered to be a deficiency which can be made up by taking one of the following courses currently offered:

- Advanced Calculus: MA 471G
- Linear Algebra: MA 321
- Programming: CS 221

No elective or other credit will be granted for such make-up work.

This program will require 36 credit hours of course work with at least 15 credit hours of this course work at the 600 level or above. In all other respects, the usual Graduate School requirements for distribution and grade point average will apply. The required major for this degree will consist of nine courses to be known as the core of the program.

Each student will be required to take a minor consisting of a two-course (six credit) sequence. This will generally be in an area of application.

Each candidate for the M.S. degree in Operations Research will be required to pass a written final examination.

- 515 Mathematical Programming and Extensions.....(3)
- 524 Probability.....(3)
- 525 Introductory Statistical Inference.....(3)
- 616 Numerical Techniques for Nonlinear Optimization.....(3)
- 617 Markovian Decision Problems.....(3)

- 618 Combinatorics and Networks.....(3)
- 619 Problems Seminar in Operations Research.....(3)
- 624 Applied Stochastic Processes.....(3)

Pathology

Graduate Faculty: Associate Professor Peter Oeltgen.

While there is no graduate program in pathology, the department offers several courses which are open to qualified graduate students. The permission of the department chairman is required prior to enrollment.

- 611 Biopathology.....(3)
- 660 Clinical Toxicology and Drug Monitoring.....(3)
- 685 Advanced Immunobiology.....(3)

Pharmaceutical Sciences

Graduate Faculty: Professors Jordan L. Cohen, Patrick DeLuca, George Digenis, Lewis Dittert, Boyd E. Haley, Anwar Hussain, Harry Kostenbauder, William Lubawy, Harry Smith, Joseph Swintosky, Hsin-Hsuing Tai, and Robert A. Yokel. Associate Professors Robert A. Blouin, Peter Crooks, Thomas S. Foster, Mark N. Gillespie, Michael Jay, Pan Kaja Kadaba, Milton Kornet, Yih-Loong Lai, Patrick J. McNamara and Jack W. Olson.

Associate Members: Assistant Professors Peter Byron, Stephen Joel Coons and Peter Wedlund.

Joint Appointments: Professor David Watt.

Emeritus Professors: Charles Lesshaft and Mark M. Luckens.

The College of Pharmacy offers M.S. and Ph.D. programs in pharmaceutical sciences, with concentration in areas of pharmaceuticals and pharmaceutical chemistry such as physical pharmacy, pharmaceutical technology, biopharmaceutics and pharmacokinetics, pharmaceutical analysis, radiopharmacy, medicinal chemistry and natural products chemistry, mechanisms of drug action and drug metabolism.

The M.S. degree is offered under a modification of Plan A which permits students to take approximately one-half of their courses in work areas outside the major area. Plan B may be employed only in exceptional cases.

The language requirement for both the M.S. and Ph.D. degrees is a reading knowledge of one foreign language chosen from French, German, or Russian.

Pharmaceutical Sciences' graduate students are typically enrolled in graduate courses in departments of chemistry, statistics, biochemistry, pharmacology, and others, depending upon the focus of the student's program. Superimposed upon this base, it is expected that the student will take graduate level courses within the major area of interest from the courses listed in Pharmacy.

For regular admission to graduate study in pharmaceutical sciences a student should have a sound background in pharmacy, chemistry and biology, with a mastery of mathematics through calculus. Applicants lacking basic requirements in these areas will be required to make up such deficiencies by taking undergraduate courses for non-graduate credit.

510	Modern Methods in Pharmaceutical Analysis.....(5)
520	Special Topics in Pharmacy Law.....(2)
525	Introduction to Sociopharmacology.....(2)
530	Practice of Radiopharmacy.....(3)
540	Industrial Pharmaceutical Technology.....(4)
545	Sterile Parenterals and Devices.....(2-3)
595	Independent Problems in Pharmacy Administration.....(1-3)
612	Quantitative Pharmacodynamics. Pharmacokinetics.....(3)
620	Natural Products Chemistry.....(3)
622	Advanced Biopharmaceutics.....(2)
630	Pharmaceutical Rate Processes.....(3)
631	Equilibrium Phenomena in Pharmaceutical Systems.....(3)
640	Methods in Pharmacological Research I.....(2)
641	Methods in Pharmacological Research II.....(2)
664	Theory and Practice of Drug Metabolism.....(3)
680	Research Methods in Social and Administrative Pharmacy.....(3)
749	Dissertation Research.....(0)
760	Topics in Pharmaceutical Sciences.....(2-4)
762	Bioorganic Mechanisms.....(3)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
776	Seminar in Pharmaceutical Sciences I.....(1)
778	Seminar in Pharmaceutical Sciences II.....(1)
780	Special Problems in Pharmaceutical Sciences.....(1-6)
790	Research in Pharmaceutical Sciences.....(1-12)

Pharmacology

Graduate Faculty: Professors Donald F. Diedrich, James W. Flesher, William R. Martin, T.G. Schariff, Glen R. Van, Mary Vore and W.J. Waddell*. Associate Professors John Carney, Edgar Iwamoto, Donald Jasinski, Norman Pedigo and John Slevin. Adjunct Associate Professor John A. Dougherty.

Associate Member: Assistant Professors Joseph R. Holtman and Michael Piascik.

Joint Appointment: Professor Louis Diamond.

Emeritus Professors: T.Z. Csaky, Helmut Gordon and Harris Isbell.

*Joint appointment with University of Louisville.

The Department of Pharmacology offers M.S. and Ph.D. degrees in Pharmacology.

Pharmacology is the study of drugs. Pharmacologists in modern society find careers as teachers, as scientists engaged in research of problems related to developing new drugs, evaluating drugs for their efficacy and toxicity, as well as studying mechanisms of action.

Graduates from accredited colleges with

bachelor degrees in the biological sciences, in chemistry, physics or pharmacy or with professional degrees in medicine, dentistry, veterinary medicine or pharmacy are eligible for candidacy for graduate degrees in pharmacology. It is advisable that the candidates have good basic training in mathematics, physics, chemistry and biological sciences. A major part of the Ph.D. program involves independent research under the direction of a member of the graduate faculty. Training can be obtained in neuropharmacology, psychopharmacology, drug metabolism, carcinogenesis, receptor mechanisms, toxicology, neuroendocrinology, cardiovascular pharmacology and problems related to drug abuse.

There is also a combined M.D./M.S. (in pharmacology) program available.

Only one modern foreign language is required for the Ph.D. degree in Pharmacology.

Inquiries concerning the details of the program as well as possible financial support for graduate students should be addressed to the Chairman of the Department of Pharmacology.

There is available a joint program in Pharmacology between the University of Kentucky and the University of Louisville. Inquiries relative to this program should be directed to the Department of Pharmacology.

522	Systems Pharmacology.....(3)
541	Biological Assay.....(4)
602	Neuropharmacology.....(4)
603	Pharmacology of Organs and Systems.....(3)
612	Quantitative Pharmacodynamics, Pharmacokinetics.....(3)
621	Advanced Pharmacodynamics.....(4)
634	Pharmacology of Cardiovascular Drug Therapy.....(3)
650	Host-Contaminant Relationships.....(2)
658	Advanced Neuropharmacology.....(3)
660	Pharmacology of Steroids.....(4)
663	Drug Metabolism and Disposition.....(3)
672	Behavioral Pharmacology and Toxicology.....(2)
749	Dissertation Research.....(0)
750	Research in Pharmacology.....(1-5)
768	Residence Credit for Master's Degree.....(1-6)
769	Residence Credit for Doctor's Degree.....(0-12)
770	Seminar in Pharmacology.....(1)

Philosophy

Graduate Faculty: Professors Daniel Breazeale, Ronald Bruzina, Dallas High, Thomas Olshewsky and Alan Perreiah. Associate Professors Joan Callahan, James E. Force, Don A. Howard, James Manns and Henry Schankula. Adjunct Professor Edward Madden.

Associate Members: Associate Professors Daniel H. Frank and Patricia Smith. Assistant Professors Robert J. Burkhardt, Harmon R. Holcomb and Theodore R. Schatzki.

Emeritus Professor: Jesse de Boer.

The Department of Philosophy offers programs of study leading to both the Master of Arts and the Doctor of Philosophy degrees.

The M.A. program offers students a thorough training in the history and disciplines of philosophy as well as the skills of philosophical analysis and interpretation. The unspecialized M.A. program prepares students for more advanced philosophical study as well as for professional training in other fields. The M.A. program requires the completion of a minimum of 30 semester hours of course work and the completion of three comprehensive examinations. A reading knowledge of one foreign language is required. An undergraduate major in philosophy is not required for admission. Indeed, students who have a broad liberal arts education are encouraged to apply. However, remedy for deficient background in the history of philosophy and logic must be undertaken upon entrance to the program.

The Ph.D. program in philosophy is designed to prepare students for advanced research and professional work in many fields which link philosophy to other disciplines. Although the program will prepare some graduates for teaching positions, this is not its primary purpose. Rather it seeks to investigate and to apply philosophical methods to the problems and issues which arise across a variety of disciplines. Interdisciplinary research is thus the focal emphasis of the program. Students enrolled in the Ph.D. program are encouraged to take courses (up to one-third of their total hours) in other fields. Each student will follow an individually designed program of study under the supervision of the student's advisory committee. Each student will declare an area of specialization. A reading knowledge of one foreign language is required as well as competence in intermediate level logic. Students who have already earned the M.A. degree should apply for direct admission to the Ph.D. program. Students desiring the Ph.D. degree, but who have not completed the M.A. degree, must earn the M.A. degree as a pre-requisite.

520	Symbolic Logic.....(3)
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GROUP A

503	Topics in Ancient Philosophy.....(3)
506	Topics in Medieval Philosophy.....(3)
509	Topics in History of Modern Philosophy.....(3)
513	Nineteenth Century Philosophy.....(3)
514	American Philosophy.....(3)
515	Contemporary Philosophy: The Analytic Turn.....(3)
516	Contemporary Philosophy: Phenomenological Directions.....(3)
517	Existentialism.....(3)
520	Symbolic Logic II.....(3)

GROUP B

530 Ethical Theory.....(3)
 535 Social and Political Philosophy.....(3)
 537 Philosophy of Law.....(3)
 545 Philosophy of Religion.....(3)
 592 Aesthetics.....(3)

GROUP C

550 Philosophical Problems in Knowledge and Reality.....(3)
 560 Philosophy of Scientific Method.....(3)
 561 Philosophical Problems in the Natural Sciences (Subtitle Required).....(3)
 562 Philosophical Problems in the Social and Behavioral Sciences.....(3)
 565 Philosophy of Language.....(3)
 570 Philosophy of History.....(3)
 575 Philosophy of Mind.....(3)

GRADUATE SEMINARS

625 Advanced Logic.....(3)
 630 Seminar in Moral Philosophy.....(3)
 650 Seminar in Metaphysics and Epistemology (Subtitle Required).....(3)
 655 Seminar in Theory of Knowledge.....(3)
 680 Special Topics in Philosophy.....(3)
 700 Seminar in Ancient Philosophy.....(3)
 705 Seminar in Medieval Philosophy.....(3)
 710 Seminar in Modern Philosophy.....(3)
 715 Seminar in Recent Philosophy.....(3)
 749 Dissertation Research.....(0)
 750 Seminar in Interdisciplinary Issues.....(3)
 755 Tutorial in Interdisciplinary Issues.....(1-6)
 768 Residence Credit for the Master's Degree.....(1-12)
 769 Residence Credit for Doctoral Degree.....(0-12)
 790 Research in Philosophy.....(3)

Physics and Astronomy

Graduate Faculty: Professors Frank O. Clark, John Connolly, Marcel Coz, Peter C. Eklund, Moshe Elitzur, Fletcher Gabbard, Guy Lehman, Keh Liu, Keith B. MacAdam, Alan Mackeller, Marcus McEllistram, Joseph P. Straley, K.R. Subbaswamy and Jesse Weil. Associate Professors Li Bing-an, Joseph W. Brill, John Christopher, Lance DeLong, Robert Knight, Michael Kovash and Thomas H. Troland. Adjunct Professors George Hurst and Robert A. Stokes.

Associate Members: Assistant Professors Suketu P. Bhavsar, David A. Harmin, Nicholas Martin, Mark Anthony Pickar and Michael V. Torbett.

Joint Appointment: Professors Eugene B. Bradley, Earl L. Steele and Classine VanWinter. Assistant Professor Nicholas Martin.

Emeritus Professors: Lewis Cochran, Richard Hanau, Bernard Kern and Francis Yost.

The Department of Physics and Astronomy offers courses and research options leading to the M.S. and Ph.D. degree in the special areas of astronomy and astrophysics, atomic and molecular physics, nuclear and intermediate energy physics, and condensed matter physics. Excellent laboratory facilities and library materials are available. A major experimental facility is the six-million volt Van de Graaff accelerator. More detailed descriptions of each of these options will be sent on request. Theoretical as well as experimen-

tal work is being pursued in all the above mentioned areas.

Plan A or Plan B may be used to satisfy the requirements for the M.S. degree.

The M.S. program emphasizes applied physics and students are encouraged to take courses in related areas such as engineering and biology when such courses fill a need in their academic objectives. The M.S. candidates must pass a departmental exam covering the core course work.

The Ph.D. degree is a research degree granted on the basis of broad knowledge of physics and in-depth study in a specific area leading to a thesis reflecting original work by the doctoral candidate. A comprehensive examination is given to all students and a passing score on this examination admits a student to candidacy for the Ph.D. degree.

To be admitted to candidacy for the Ph.D. degree, students must demonstrate a reading knowledge in one foreign language. French, German, or Russian are acceptable languages; others may be used by special permission.

Candidates for doctoral degrees may perform their thesis research work at the Lexington Campus of the University of Kentucky or arrangements may be made to do this work at other institutions or laboratories such as the Oak Ridge National Laboratory, the National Astronomical Radio Observatory or other places by special arrangement.

PHYSICS

401G Special Topics in Physics and Astronomy for Elementary and High School Teachers.....(2-4)
 402G Electronic Instrumentation and Measurements.....(3)
 404G Mechanics.....(3)
 416G Electricity and Magnetism.....(3)
 417G Electricity and Magnetism.....(3)
 472G Interaction of Radiation with Matter.....(3)
 492G Galactic Astronomy II.....(3)
 504 Advanced Mechanics.....(3)
 506 Methods of Theoretical Physics I.....(3)
 507 Methods of Theoretical Physics II.....(3)
 508 Optics.....(3)
 520 Introduction to Quantum Mechanics.....(3)
 522 Heat and Thermodynamics.....(3)
 524 Solid State Physics.....(3)
 525 Solid State Physics.....(3)
 530 Experimental Physics: Spectroscopy.....(2)
 535 Experimental Physics: Atomic and Nuclear.....(2)
 538 Experimental Physics: Light.....(2)
 545 Radiation Hazards and Protection.....(3)
 546 General Medical Radiological Physics.....(2)
 554 Fundamental Atomic Physics.....(3)
 555 Fundamental Nuclear Physics.....(3)
 567 Introduction to Lasers and Masers.....(3)
 591 Cosmology I.....(3)
 592 Cosmology II.....(3)
 595 Introduction to Astrophysics I.....(3)
 600 Selected Topics in Advanced Physics.....(2-3)
 604 Classical Mechanics.....(3)
 611 Electromagnetic Theory I.....(3)
 613 Electromagnetic Theory II.....(3)

624 Theory of the Solid State.....(3)
 625 Theory of the Solid State.....(3)
 629 Nuclear Physics I.....(3)
 630 Nuclear Physics II.....(3)
 631 Atomic Structure.....(3)
 632 Statistical Mechanics.....(3)
 639 Theoretical Astrophysics.....(3)
 640 Theoretical Astrophysics.....(3)
 714 Quantum Mechanics I.....(3)
 715 Quantum Mechanics II.....(3)
 716 Advanced Quantum Mechanics.....(3)
 749 Dissertation Research.....(0)
 768 Residence Credit for the Master's Degree.....(1-6)
 769 Residence Credit for the Doctor's Degree.....(0-12)
 770 Colloquium.....(1)
 781 Independent Work in Physics.....(3)
 790 Research in Physics.....(3)
 791 Research in Physics.....(5)

ASTRONOMY

591 Cosmology I.....(3)
 592 Cosmology II.....(3)
 595 Introduction to Astrophysics I.....(3)

Physiology and Biophysics

Graduate Faculty: Professors Louis Boyarsky, Nausherwan K. Burki, John N. Diana, Joseph Engelberg, Donald Frazier, Henry Hirsch, Bertram Peretz, David Randall, Daniel Richardson, Paul Thornton, David Wekstein, Fred Zechman and James Zolman. Associate Professors Brian Jackson, Lu Lee, Sandra J. Legan, Coburn Ott and Michael Vernon.

Associate Members: Associate Professor Bernard Fleming. Assistant Professors Kirk Barron, David J. Combs, Cheryl Miller Heesch, William Robert Revelette and Dexter Franklin Speck.

Joint Appointments: Professors Eugene C. Crawford, James F. Lafferty and Jesse E. Sisken.

Emeritus Professor: James W. Archdeacon.

The graduate program, which offers both the M.S. and Ph.D. degrees, is designed to educate and train students to be competent research scientists and teachers of physiology and biophysics. The specific objectives are to provide students with: (1) an environment which promotes independent development and habits of lifelong scholarship, (2) a broad base of knowledge of the principles of molecular, cellular and organ-system physiology and biophysics, (3) the capacity to carry out independent research in an area of physiology or biophysics and, (4) experience and training in the teaching of physiology and biophysics.

To fulfill these objectives the program combines formal course work, independent reading, interaction with scholars at the tutorial level, and independent research including a dissertation.

Admission to the graduate program is competitive and is based upon academic background, professional recommendations, performance on the Graduate Record Ex-

amination, experience, and when possible, personal interviews. In general, one year of biology and physics, two years of chemistry, and mathematics through calculus are required. A course in statistics is strongly recommended.

In conjunction with the Colleges of Medicine and Dentistry the department will consider for admission those qualified students who wish to pursue a combined professional and graduate program. In addition, special programs may be developed in biophysics and biomedical engineering.

Inquiries should be addressed to the Director of Graduate Studies.

412G Principles of Human Physiology	
Lectures.....	(4)
502 Principles of Physiology Lecture.....	(5)
504 Independent Work in Physiology.....	(2-4)
512 Cellular Physiology.....	(4)
520 Theoretical Biophysics.....	(3)
522 Quantitative Physiology.....	(4)
535 Comparative Neurobiology and Behavior.....	(3)
549 Comparative Endocrinology.....	(3)
550 An Introduction to Integrative Thought.....	(3)
604 Advanced Cardiovascular Physiology.....	(3)
606 Advanced Neurophysiology.....	(3)
607 Hormonal Control Mechanisms (Subtitle Required).....	(3)
627 Proseminar in Physiological Psychology.....	(2)
630 Advanced Topics in Physiology and Biophysics.....	(1-3)
660 Systems Physiology.....	(3)
749 Dissertation Research.....	(0)
767 Topical Seminar in Physiological Psychology.....	(3)
768 Residence Credit for the Master's Degree.....	(1-6)
769 Residence Credit for the Doctor's Degree.....	(0-12)
771 Proseminar in Cell Physiology and Biophysics.....	(2)
772 Proseminar in Mammalian Physiology.....	(2)
774 Graduate Seminar in Physiology.....	(1)
791 Research in Physiology.....	(1-15)

Plant Pathology

Graduate Faculty: Professors Richard Ferris, Said A. Ghabrial, J.W. Hendrix, Joseph Kuc, T.P. Pirone, Louis Shain, John G. Shaw, S.J. Sheen, Robert Shepherd, M.R. Siegel and David Smith.

Associate Members: Assistant Professor Christopher L. Schardl. Extension Professors John R. Hartman, William C. Nesmith and Richard E. Stuckey.

Joint Appointment: Associate Professor Louis Shain.
Emeritus Professor: Richard Chapman, Stephen Diachun and Harry Wheeler.

The department offers work leading to the M.S., M.S. in Agriculture, and Ph.D. degrees. For the Ph.D. degree individual programs of study must conform with the requirements established by The Graduate School; proficiency in one foreign language is required; a minor is not required.

400G Principles of Plant Pathology.....	(3)
503 Plant Biochemistry.....	(3)
558 Nematode Diseases of Plants.....	(3)
558 not on list at all	
595 Epidemiology and Control of Plant Diseases.....	(4)
601 Special Topics in Molecular and Cellular Genetics.....	(1)
640 Identification of Plant Diseases.....	(3)
652 Plant Pathogenic Fungi.....	(3)
656 Plant Virology.....	(4)
660 Dynamics of Plant-Pathogen Interactions.....	(3)
661 Genetics of Plant-Microbe Interactions.....	(3)
749 Dissertation Research.....	(0)
768 Residence Credit for the Master's Degree.....	(1-6)
769 Residence Credit for the Doctor's Degree.....	(0-12)
770 Plant Pathology Seminar.....	(1)
784 Special Problems in Plant Pathology.....	(1-3)
794 Research in Plant Pathology.....	(1-4)

Plant Physiology

Graduate Faculty: Professor L.P. Bush, George Cheniae and George Wagner.

Associate Members: Assistant Professors Joseph Chappell and Arthur G. Hunt. Adjunct Assistant Professor Michael E. Salvucci.

Joint Appointments: Professors A.J. Hiatt, Thomas R. Kemp, Joseph Kuc and Elizabeth Williams. Associate Professor William S. Cohen. Assistant Professors Douglas D. Archbold, Michael Barrett, Robert Geneve, David Hildebrand, Robert Houtz, Thomas W. Kimmerer, Christopher L. Schardl, David D. Wagner and Leslie Weston. Adjunct Associate Professor Charles MacKown. Adjunct Assistant Professor Steven Crafts-Brandner.

Emeritus Professors: R.A. Chapman, S. Diachun, William Duncan and Harry Wheeler.

The University-wide, interdepartmental graduate program offers a plan of study leading to the Master of Science and the Doctor of Philosophy degree. The aim of this program is to aid students in developing a high degree of excellence in plant physiology/biochemistry/molecular biology.

Faculty members of the program are from the Thomas Hunt Morgan School of Biological Science in the College of Arts and Sciences and the Departments of Agronomy, Forestry, Horticulture, and Plant Pathology in the College of Agriculture. Areas of research pursued by the faculty members include stress physiology and biochemistry, metabolism and roles of secondary products in disease resistance, biochemical and molecular basis of disease resistance, biophysics and biochemistry of photosynthesis and photorespiration, physiology of crop yield, senescence, regulation of gene expression, physiology of stress and population genetics in forest species, mineral nutrition and ion transport, alleopathy, plant morphogenesis in tissue culture and genetic transformation of plants.

Course offerings in plant physiology are co-listed under the Thomas Hunt Morgan School of Biological Science and Departments of Agronomy, Horticulture, and Plant Pathology. Plant Physiology utilizes courses in the Departments of Biochemistry, Chemistry, Mathematics, and Statistics as supporting courses to suit the needs and interests of the individual student.

Programs leading to advanced degrees must conform to the general rules and regulations of The Graduate School. Requirements for the M.S. and Ph.D. degrees (Plan A) are 24 and 30 credit hours of prescribed course work, respectively, and an acceptable thesis. A minor requires 15 credit hours of prescribed course work. Contact the Director, N212F, Agricultural Science Center—North for additional information.

530 (BIO) Plant Physiology.....	(3)
531 (BIO) Laboratory in Plant Physiology.....	(2)
630 (AGR, BIO) Experimental Techniques in Plant Physiology.....	(3)
660 (PPA) Physiology of Plant Disease.....	(3)
735 (BIO) Plant Metabolism.....	(3)
732 (AGR, BIO, HOR) Mineral Nutrition of Plants.....	(3)
734 (AGR, BIO, HOR) Physiology of Growth and Development.....	(3)
769 (BIO) Residence Credit for the Doctor's Degree.....	(0-12)
771 (BIO) Seminar in Plant Physiology.....	(1)
773 (AGR) Seminar in Plant Physiology.....	(1)

Political Science

Graduate Faculty: Professors Michael Baer, Bradley Canon, Vincent Davis, Malcolm Jewell, W.E. Lyons, Daniel N. Nelson, Hubert Reid, Ernest Yanarella and Sung C. Yang. Associate Professors William D. Berry, Kenneth Coleman, Stanley Feldman, George Gadbois, Donald Gross, Karen Mingst, Phillip Roeder and Bruce A. Williams.

Associate Members: Associate Professor Charles Davis. Assistant Professors Chung Moon, Mark A. Pefley, Susan Rhodes and Andrew L. Ross.

Emeritus Professor: S. Sidney Ulmer, Amry Vandembosch and Kenneth VanLandingham.

Candidates for admission to the graduate program in political science must provide the information required by The Graduate School and must also submit at least three letters of recommendation from persons familiar with the applicant's academic performance. Students who do not have political science undergraduate majors are welcome in this program.

The Political Science Department offers both the M.A. and Ph.D. degrees. The M.A. degree may be earned under either of two plans: Plan A requires at least 24 hours of course work and a thesis; Plan B requires at least 30 semesters hours of course work and examination in three fields of political science, or in two fields of political science

and one outside field. Under either plan, the student must take at least two-thirds of the required semester hours in political science, and at least half of the political science work must be in courses open only to graduate students. A candidate for the Plan B master's degree must pass a foreign language requirement or an analytical skills requirement.

The Ph.D. program is divided into a general phase and a specialized phase. Entering students spend their first year in the general phase, which includes proseminars in methodology and in at least four major fields of political science. (Students who have previously taken graduate work may be exempt from some of these proseminars.) At the end of the first year of graduate work, the student is evaluated by a departmental committee which determines whether the general phase has been satisfactorily completed.

During the specialized phase of the graduate program, the student's work is based on a program prepared with the Advisory Committee. The students take advanced work in at least two substantive fields in political science. The qualifying examination in political science consists of a written and oral examination in each of the two substantive fields specified in the student's program. The examination is given by the Advisory Committee. Following this examination the students write a prospectus for the dissertation and are examined orally on this by the Advisory Committee. The students then write a dissertation and defend it in a final oral examination.

Candidates for the Ph.D. in political science are required either to demonstrate a reading knowledge of two modern foreign languages or to meet that requirement in one modern foreign language and to demonstrate proficiency in an allied field contributing to research competence in political science. Research competence may be demonstrated by successfully completing at least six hours of course work in one or more allied fields, including statistics, computer sciences, and research methods in another discipline.

Additional details concerning departmental requirements may be secured from the Department of Political Science.

411G	Comparative Government-Parliamentary Democracies I.....(3)
412G	Comparative Government-Parliamentary Democracies II.....(3)
417G	Survey of Sub-Saharan Politics.....(3)
419G	The Governments and Politics of Eastern Asia.....(3)
420G	Governments and Politics of South Asia.....(3)
421G	Government and Politics of Southeast Asia.....(3)
427	East European Politics.....(3)

428G	Latin American Government and Politics.....(3)
429G	Government and Politics of the Soviet Union.....(3)
430G	The Conduct of American Foreign Relations.....(3)
431G	National Security Policy.....(3)
433G	Politics of International Economic Relations.....(3)
436G	International Organization.....(3)
437G	Dynamics of International Law.....(3)
439G	Contemporary International Problems.....(3)
441G	Early Political Theory.....(3)
442G	Modern Political Theory.....(3)
450G	Rural Local Government.....(3)
452G	Municipal Government.....(3)
455G	Intergovernmental Relations in the American Federal System.....(3)
456G	Appalachian Politics.....(3)
461G	Civil Liberties.....(3)
463G	The American Judicial Process.....(3)
465G	Constitutional Politics.....(3)
470G	American Political Parties.....(3)
472G	Political Campaigns and Elections.....(3)
473G	Public Opinion.....(3)
476G	Legislative Process.....(3)
487G	Introduction to Public Administration.....(3)
489G	The Analysis of Public Policy.....(3)
515	Comparative Political Parties.....(3)
525	Comparative Study of Political Violence.....(3)
532	Comparative Foreign Policies.....(3)
538	Latin American Relations.....(3)
539	The Foreign Policy of the Soviet Union.....(3)
545	American Political Thought.....(3)
549	Science, Technology and Political Theory.....(3)
553	Urban Government and Politics.....(3)
554	Politics of Land Use and Growth Management.....(3)
555	Intergovernmental Relations in the American Federal System.....(3)
557	Kentucky Government and Politics.....(3)
571	Interest Groups.....(3)
572	Political Campaign Strategy and Techniques.....(3)
580	The Budgetary Process.....(3)
584	The American Presidency and the Federal Executive.....(3)
588	Public Personnel Administration.....(3)
611	Ethical Issues in Political Life.....(3)
612	Polling and Survey Research.....(3)
614	Political Parties and Elections in America.....(3)
620	Comparative Politics: Theory and Method.....(3)
630	Proseminar in Non-Institutional Political Behavior.....(3)
654	Proseminar in Judicial Process.....(3)
671	Strategies of Inquiry in Political Science.....(3)
672	Introduction to Techniques of Political Research.....(3)
674	Proseminar in Theories of International Politics.....(3)
680	Proseminar in Political Institutions and Process.....(3)
685	Proseminar in Public Administration and Policy.....(3)
690	Contemporary Political Thought: Theoretical Foundations of Political Concepts and Issues in the Twentieth Century.....(3)
711	Current Research in Political Science.....(3)
737	Transnational Organizations and Processes.....(3)
749	Dissertation Research.....(0)

750	Political Parties and Elections in America.....(3)
751	Seminar in Metropolitcs.....(3)
752	Problems in State and Local Government.....(3)
757	Seminar in Comparative Democratic Political System.....(3)
758	Seminar in Soviet Politics, Government, and Foreign Policy.....(3)
761	The Constitution and Civil Rights.....(3)
762	Seminar in Judicial Policy Making.....(3)
763	Seminar in Administrative Politics.....(3)
764	Research in Judicial Behavior.....(3)
768	Residence Credit for the Master's Degree.....(1-6)
769	Residence Credit for the Doctor's Degree.....(0-12)
770	Seminar in Contemporary Political Theory.....(3)
772	Advanced Problems in Research Methods.....(3)
775	Seminar in Public Policy.....(3)
776	Seminar in Political Development.....(3)
777	Research Problems in International Relations.....(3)
778	Seminar in Comparative Foreign Policies.....(3)
779	Voting Behavior.....(3)
780	Legislative Behavior.....(3)
784	Seminar in Political Socialization.....(3)
785	Psychological Bases of Political Behavior.....(3)
795	Special Problems in Political Science.....(1-3)
796	Directed Research in Political Science.....(1-3)

Psychology

Graduate Faculty: Professors Robert Baker, Ronald Dillehay, Jesse Harris, Russell A. Jones, Thomas W. Miller, Michael Nietzel, Arthur Nonneman, Douglas Snyder and Thomas Zentall. Associate Professors Michael Baedo, Edward Engel, Elizabeth Lorch, Robert E. Lorch, Donald McCoy, Richard M. Lich and Thomas Widigrie.

Associate Members: Professor Billie Ables. Associate Professor James Norton. Assistant Professors Michael A. Andrykowski, Ruth A. Baer, David T. Berry, Roberta A. Ferrara, Monica J. Harris and Chris O'Sullivan.

Auxiliary Member: David Kravitz.

Emeritus Professors: James Calvin, Edward Newbury, and Frank Pattie.

The department offers one Ph.D. degree in psychology in two programs: clinical psychology and experimental psychology, the latter subdivided into behavioral and neural studies, cognitive and developmental studies, and social psychology. The major goal of the doctoral programs in psychology is to prepare the student for a career in teaching and research.

The area of specialization in clinical psychology provides academic courses, practica, and internships which permit students to combine their teaching and research activities with a clinical career in the mental health field. Special areas of expertise among clinical faculty include psychological assessment and psychotherapy with children and adults, marital and family therapy, neuropsychology, psychodiagnosis and experimen-

tal investigations of psychopathology, psychotherapy process and outcome research, behavioral medicine, and forensic psychology. Clinical training is facilitated by early placement of students at a variety of settings including various medical settings, a federal corrections facility, community mental health centers, state and private psychiatric hospitals, and the department's own psychological clinic. The clinical program is fully accredited by the American Psychological Association.

The behavioral and neural studies area provides a combination of formal course work and individualized training designed to produce research oriented psychologists who are capable of continuing productive scholarship and teaching. Emphasis is placed on theoretical treatments and empirical studies of fundamental learning processes and on the neurophysiological bases of behavioral change. Current research within the program includes learning, memory, animal intelligence, psychopharmacology, developmental psychobiology, and recovery from brain damage.

The area in cognitive and developmental studies prepares students for a career in teaching and research with a concentration in either adult cognition or cognitive development. Training combines formal proseminar and seminar learning experience with supervised research and teaching experience. Although basic theory in cognitive and developmental psychology is emphasized, students wishing to apply their training in nonacademic settings (e.g., human factors) are encouraged in their interests. Current research within the program includes: memory, reading, development of attention, development of problem-solving skills, and children's comprehension of television.

The area in social psychology is designed to provide intensive experience in research with members of the social psychology faculty, with the aim of developing in the student a strong theoretical and research competence with complex social phenomena. Traditions of both experimental laboratory research and naturalistic study are utilized; emphases include theoretical and applied significance of research. Within broad limits set by the program, any given student's course of study is designed to fit that student's particular needs and interests. Course work in related behavioral sciences (for example, sociology, anthropology) is encouraged.

During the first year of the doctoral program, students in all areas gain experience in the major content areas of psychology and in psychological statistics. Thereafter, the student and the adviser construct a program

of study consistent with the academic interests and professional goals of the student. A reading knowledge of one modern foreign language is required for Ph.D. candidates.

The M.A. or M.S. degree is awarded under Plan A only, as one component of doctoral training.

The minimum departmental standards for admission to graduate work in psychology include an undergraduate department overall average of B or better, a satisfactory score on the verbal and quantitative aptitude of the Graduate Record Examination and three letters of recommendation. For additional information concerning the program in psychology and such matters as financial support, contact the Director of Graduate Studies, Department of Psychology.

423G	Processes of Psychological Development.....	(3)
444G	Social Psychology.....	(3)
459G	Drugs and Behavior.....	(3)
500	Senior Seminar in Psychology.....	(3)
502	Introduction to Industrial Psychology.....	(3)
503	Psychology of Industrial Personnel Procedure.....	(3)
521	Cognitive Processes Laboratory.....	(1)
523	Research Methods in Developmental Psychology.....	(4)
525	Human Senses and Perception.....	(3)
526	Human Senses and Perception Laboratory.....	(1)
527	Cognitive Processes.....	(3)
528	Dimensions of Aging.....	(3)
529	Psycholinguistics.....	(3)
532	Personality.....	(3)
533	Abnormal Psychology.....	(3)
535	Psychological Testing.....	(3)
539	Interpersonal Dynamics.....	(3)
545	Small Group Behavior.....	(3)
547	Experimental Social Psychology.....	(4)
548	Applied Social Psychology.....	(3)
550	Psychology of Learning.....	(3)
551	Psychology of Learning Laboratory.....	(1)
552	Animal Behavior.....	(3)
553	Animal Behavior Laboratory.....	(1)
556	Physiological Psychology.....	(3)
557	Physiological Psychology Laboratory.....	(1)
558	Biology of Motivation.....	(3)
603	Psychopathology.....	(3)
610	Psychometrics.....	(3)
611	Psychological Research.....	(3)
616	Research Design in Clinical Psychology.....	(3)
617	Experimental Approaches to Personality.....	(3)
618	Experimental Approaches to Psychopathology.....	(3)
620	Proseminar in Systematic Psychology.....	(2)
621	Proseminar in Learning.....	(2)
622	Proseminar in Personality.....	(2)
623	Proseminar in Sensation and Perception.....	(2)
624	Proseminar in Social Psychology.....	(2)
625	Proseminar in Developmental Psychology.....	(2)
626	Survey of Health Psychology.....	(3)
627	Proseminar in Physiological Psychology.....	(2)
628	Proseminar in Cognitive Processes.....	(2)
629	Introduction to Clinical Psychology.....	(2)
630	Clinical Methodology I.....	(2)
631	Practicum in Clinical Methodology I.....	(2)
632	Clinical Methodology II.....	(2)
633	Practicum in Clinical Methodology II.....	(2)
634	Practicum in Clinical Methodology III.....	(3)
636	Systems of Psychotherapy.....	(3)

637	Practicum in Psychotherapy and Behavior Change.....	(1-3)
638	Clinical Child Psychology.....	(3)
644	Methods of Social Psychology Inquiry.....	(3)
663	Practicum in Industrial Psychology.....	(3)
700	Topical Seminar in Behavior Modification.....	(3)
701	Topical Seminar in Clinical Child Psychology.....	(3)
702	Topical Seminar in Community Mental Health.....	(3)
703	Seminar in Group Therapy.....	(3)
705	Research in Psychotherapy and Behavior Change.....	(3)
710	Topical Seminar in Clinical Psychology.....	(3)
713	Practicum in Group Therapy.....	(3)
749	Dissertation Research.....	(0)
767	Topical Seminar in Physiological Psychology.....	(3)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
772	Topical Seminar in Learning.....	(3)
774	Topical Seminar in Cognitive Processes.....	(3)
775	Topical Seminar in Perception.....	(3)
776	Topical Seminar in Animal Motivation.....	(3)
778	Topical Seminar in Developmental Psychology.....	(3)
779	Topical Seminar in Social Psychology.....	(3)
780	Problems in Psychology.....	(1-3)
781	Research Participation.....	(1)
790	Research in Psychology.....	(1-12)

Public Administration

Graduate Faculty: Professor Philip K. Berger. Associate Professors Robert Rodgers and Eugenia Toma.

Joint Appointments: Professors Michael Baer, Glen C. Blomquist, Richard W. Fuest, Merlin Hackbart, Donald L. Hockstrasser, William E. Lyons, and William Stober. Associate Professors William D. Berry, Keith Provan, Philip W. Roeder and Bruce A. Williams.

The Martin School of Public Administration, a research, academic, and service unit of The Graduate School, offers the Ph.D. and MPA degrees. The Ph.D. in Public Administration is designed to prepare students to function at a high level of analytic sophistication in academic and administrative positions. The Master of Public Administration is a 45 credit-hour program designed for those seeking careers in the public, quasi-public, and private sectors.

The interdisciplinary faculty have joint appointments in the Martin School and in one of the academic departments of the College of Business and Economics, the College of Arts & Sciences, or the Medical Center.

The curriculum of the Ph.D. program provides knowledge of the principles of organizational behavior, an understanding of the public policy process and policy issues, and an ability to analyze policy and ad-

ministrative problems through research and analytical methods.

Students are required to take 42 hours of graduate course work beyond the master's degree or its equivalent. The program of study includes a 27-hour Core covering:

- Public management
- Public policy
- Research methods

and a 15-hour Area of Concentration selected from one of the following:

- Governmental Processes and Institutions
- Organization Theory and Behavior
- Public Financial Management Systems Analysis

Areas are designed by students in conjunction with their faculty advisers.

The dissertation involves research on a public management or public policy issue. An internship is necessary for students without significant public experience. The Ph.D. degree has a language requirement.

Financial support is available to qualified students through fellowships, assistantship, and research grants.

Inquiries should be made through the Director of Graduate Studies, 425 Patterson Tower.

Core Courses

Public Management (6 Hours)

PA 742 Theory of Public Organizations*

Choose one

MGT 700 Administrative Science, or

MGT 711 Organizations & External Systems, or*

PS 673 Seminar in Administrative Politics

Public Policy (12 Hours)

A substantive policy course from among economics, agriculture economics, political science, education, and the like is required of all students.*

PA 751 Public Policy Formulation, and*

PA 752 Economics of Policy Analysis*

Choose one

PA 722 Policy & Program Evaluation, or

PA 731 Fiscal & Budgetary Policy, or*

PA 753 Public Policy Implementation

Research Methods (9 Hours)

MGT 762 Research Methodology, or

PS 671 Strategies of Inquiry in Political Science

Choose 2 courses from among the following illustrative sets of research electives:

ECO 590 Introduction to Quantitative Economics I

ECO 626 Time Series Analysis

ECO 792 Econometrics I

ECO 793 Econometrics II

STA 671 Regression and Correlation

STA 672 Design and Analysis of Experiments

STA 673 Distribution-Free Statistical Inference and Analysis of Categorical Data

EDP 660 Research Design and Analysis in Education

EDP 621 Advanced Topics and Methods of

Evaluation, or

EDP 707 Multivariate Analysis in Educational Research

MGT 750 Management Science I

MGT 751 Management Science II

The MPA Program conforms with the general rules and regulations of The Graduate School. Students applying for admission to the program are expected to have an undergraduate grade point average equivalent to 2.5 or better; quantitative and verbal scores on the GRE or GMAT at approximately the 50th percentile; and a GPA of at least a 3.0 on all graduate work previously attempted.

Students are admitted from a diversity of academic disciplines. Although there are no course prerequisites, students should be familiar with concepts of economics and accounting.

Degree requirements are successful completion of 45 hours of course work with a 3.0 GPA or better and passing oral and written comprehensive examinations.

A limited number of research assistantships, scholarships and fellowships are available for full time students with high academic standings.

Generally, courses are offered in the late afternoon and evening to accommodate working students.

The Martin School MPA program is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA).

For more information, write Academic Program Coordinator, 419 Patterson Tower, University of Kentucky, Lexington, KY 40506-0027.

The MPA Program is designed to provide:

1. an Administrative Core of 27 semester hours which covers the areas of economics, finance, accounting control, management, research methods, public policy formulation and the political and legal environments of public administration; and,
2. an Area of Concentration of 18 semester hours, divided into a three-hour internship and 15 hours of coursework in one of five areas of specialization: health administration; higher education administration; general government administration; public financial management or urban and regional development administration.

Course Requirements

Completion of a minimum of 45 semester hours of graduate work is required.

A. Administrative Core (27 semester hours)

PA 621 Quantitative Methods I:

Research Methods.....(3)

PA 622 Quantitative Methods II:

Evaluation Methods.....(3)

PA 623 Quantitative Methods III:

Decision Science Methods.....(3)

PA 631 Financial Management I:

Finance and Budgeting.....(3)

PA 632 Financial Management II:

Public Sector Accounting.....(3)

PA 641 Public Organizations I:

Political Environment.....(3)

PA 642 Public Organizations II:

Theory and Behavior.....(3)

PA 651 Public Policy I:

The Policy Process.....(3)

PA 652 Public Policy II:

Economic Analysis.....(3)

B. Area of Concentration (18 semester hours)

PA 711 Internship in Public

Administration.....(3)

(Internship is required of students without significant professional experience; those with such experience substitute a policy paper or another course.)

Public Administration Electives

PA 721 Public Planning.....(3)

PA 724 Public Financial Management.....(3)

PA 725 Public Sector Computer

Applications.....(3)

PA 727 Environmental Economics,

Regulation and Policy.....(3)

PA 728 Personnel Management in

the Public Sector.....(3)

PA 795 Special Topics in

Public Administration.....(3)

PA 796 Independent Study in

Public Administration.....(3)

General Government

Coursework is taken primarily in the Department of Political Science. Up to 6 hours of MPA electives may be taken with permission of Area Adviser.

Health Administration

PA 636 Health Economics.....(3)

PA 637 Health Finance.....(3)

PA 656 Health Program Planning

and Evaluation.....(3)

PA 671 Overview of the Health

Care Delivery System.....(3)

PA 673 Health Policy Development.....(3)

PA 775 Special Topics in Health

Administration.....(3)

PA 785 Independent Study in Health

Administration.....(3)

Up to 6 hours of MPA electives may be taken with permission of Area Adviser.

Higher Education Administration

Coursework is taken primarily in the College of Education. Up to 6 hours of MPA electives may be taken with permission of Area Adviser.

Public Financial Management

PA 724 Public Financial

Management.....(3)

Coursework is taken primarily in the College of Business and Economics. Up to 6 hours of MPA electives may be taken with permission of Area Adviser.

Urban and Regional Development

PA 727 Environmental Economics,

Regulation and Policy.....(3)

Coursework is taken primarily in the College of Business and Economics and Department of Geography, College of Arts and Sciences. Up to 6 hours of MPA electives may be taken with permission of Area Adviser.

621	Quantitative Methods I: Research Methods.....	(3)
622	Quantitative Methods II: Evaluation Methods.....	(3)
623	Quantitative Methods III: Decision Science.....	(3)
631	Financial Management I: Finance and Budgeting.....	(3)
632	Financial Management II: Public Sector Accounting.....	(3)
636	Health Economics.....	(3)
637	Health Finance.....	(3)
641	Public Organizations I: Political Environment.....	(3)
642	Public Organizations II: Theory and Behavior.....	(3)
651	Public Policy I: The Policy Process.....	(3)
652	Public Policy II: Economic Analysis.....	(3)
656	Health Program Planning and Evaluation.....	(3)
671	Overview of the Health Care Delivery System.....	(3)
672	Social and Behavioral Aspects of Health Care.....	(3)
673	Health Policy Development.....	(3)
711	Internship in Public Administration.....	(3)
721	Public Planning.....	(3)
722	Field Seminar in Policy Research.....	(3)
724	Public Financial Management.....	(3)
725	Public Management Computer Applications.....	(3)
727	Environmental Economics, Regulation and Policy.....	(3)
728	Personnel Management in the Public Sector.....	(3)
731	Fiscal and Budgetary Policy.....	(3)
742	Theory of Public Organizations.....	(3)
749	Dissertation Research.....	(0)
751	Public Policy Formulation and Analysis.....	(3)
752	The Economics of Policy Analysis.....	(3)
753	Public Policy Implementation.....	(3)
769	Residence Credit for the Doctor's Degree.....	(0-12)
775	Special Topics in Health Administration.....	(2-3)
785	Independent Study in Health Administration.....	(1-3)
795	Special Topics in Public Administration.....	(1-3)
796	Independent Study in Public Administration.....	(1-3)

Radiation Medicine

Graduate Faculty: Professors Yosh Maruyama, Associate Professors Joseph L. Beach, Joseph A. Sayeg, and Guy Simmons.

Joint Appointment: Associate Professor Ralph C. Christensen.

Graduate educational programs in Radiation Medicine are closely allied with those in the Department of Health Radiation Sciences, College of Allied Health Profes-

sions. Course work involves study of the physical properties and characteristics of radiation, the effects of ionizing radiation upon matter and living organisms, and safety and protection considerations of radiation. Courses jointly listed with the Department of Physics and Astronomy teach the student about radiation interactions, radiation safety, and general medical physics. Courses jointly listed with Biological Sciences concern the biological effects of ionizing radiation. Research and clinical training in a health-medical setting provides an opportunity for the student to observe the applications of radiation physics in medicine.

Graduate programs are detailed under Health Radiation Sciences, College of Allied Health Programs elsewhere in this Bulletin. Inquiries should be addressed to the Director of Graduate Studies.

472G	Interaction of Radiation with Matter....	(3)
540	General Radiation Biology.....	(4)
545	Radiation Hazards and Protection.....	(3)
546	General Medical Radiological Physics.....	(2)
601	Advanced Radiation Dosimetry.....	(2)
640	Biological Effects of Radiation.....	(3)
647	Physics of Diagnostic Imaging I.....	(3)
648	Physics of Diagnostic Imaging II.....	(3)
649	Physics of Radiation Therapy.....	(2)
660	Practicum in Radiation Medicine.....	(1-12)
740	Mammalian Radiation Biology.....	(2)

Public Health

Graduate Faculty: Professor Arthur Frank.

Associate Member: Assistant Professor Lorann Stallones.

The Department of Preventive Medicine and Environmental Health offers a program of study leading to the Master of Science in Public Health. Public health is a broad discipline and the component parts are reflected in the requirements to obtain this degree.

Entrance into the MSPH program requires a sufficient biological and mathematical background to participate in the required courses. There is no language requirement. The required courses include health care administration, epidemiology, statistics, and occupational/environmental health. Students may elect a Plan A or Plan B option (with or without a formal master's thesis) with the possibility of specializing in a number of areas, including health care administration, occupational/environmental health, epidemiology, toxicology, and other similar areas.

There is an active program of research ongoing in the department, with much of the departmental activities having a clinical orientation.

Admission to the graduate program is

competitive and based upon academic background, performance on the Graduate Record Examination (GRE), professional experience, and interest in the field.

PM 521	Epidemiology.....	(4)
PM 601	Occupational and Environmental Health.....	(4)
PM 602	Occupational and Environmental Health.....	(4)
PM 768	Residency Credit for Master's Degree.....	(1-6)

Rehabilitation Counseling

Director, Ralph Crystal

Graduate Faculty: Associate Professor Ralph Crystal.

Associate Member: Assistant Professor Reginald Alston.

Joint Appointment: Associate Professor Charles D. Auvenshine.

The Graduate Program in Rehabilitation Counseling is an interdisciplinary program within The Graduate School of the University of Kentucky. The curriculum, in accordance with the guidelines of certification organizations in rehabilitation counseling, provides for flexible programming in response to individual student needs and interest. The program is accredited by the Council on Rehabilitation Education and fulfills national certification requirements in rehabilitation counseling. Program graduates are eligible to sit for the Rehabilitation Counseling Certification Exam.

The program trains students to understand the physical, psychological, social, and economic needs of handicapped individuals in terms of vocational adjustment, and independent living and functioning. Rehabilitation counseling is a challenging and expanding profession. The rehabilitation counselor provides and coordinates services to persons with emotional, physical, and social disabilities which interfere with productive functioning and independent living. The counselor must demonstrate competencies in establishing and conducting counseling relationships, assessment procedures, vocational placement, program planning and coordination; and have an awareness of professional and community resources that can be utilized in the rehabilitation process. Emphasis is placed on severe disability and its consequences, and independent living. Graduates of the program are employed in a wide range of public and private rehabilitation settings.

Course and field work total a minimum of 45 credit hours if the student has a bachelor's degree in rehabilitation. The typical program for other students is 55 hours, up to a maximum of 60 hours. At least 36 credit hours must be taken at the

University of Kentucky. Courses are offered in the late afternoon and early evening to accommodate full and part-time students. Students who attend the program on a full-time basis can complete the program in 16 months.

Students are admitted from a wide range of backgrounds and academic disciplines. It is assumed, however, that most students entering the program will have a background in psychology, education, sociology, rehabilitation, or other social-behavioral sciences.

The curriculum is composed of three levels of courses: basic core, advanced core, and support areas.

Basic Core

The Basic Core courses or their equivalent are required for students without a background in the field of rehabilitation or who have not otherwise had these courses.

- RC 510 Orientation to Rehabilitation Resources
- RC 512 Medical Knowledge for the Social Professions
- RC 520 Principles of Rehabilitation Counseling
- RC 530 Psycho-Social Impact of Disability
- EDP 605 Introduction to Counseling
- EDP 652 Theories of Counseling
- EDP 666 Psychology of Career Counseling or
- EDV 702 Career Development

Advanced Core

Advanced Core courses or their equivalent are required for all students enrolled in the degree program:

- RC 610 Case Management in Rehabilitation Counseling
- RC 620 Vocational Evaluation/Work Adjustment of the Severely Disabled
- RC 630 Placement Services and Techniques in Rehabilitation Counseling
- RC 710 Practicum
- RC 720 Internship
- RC 740 Administration and Supervision in Rehabilitation
- RC 750 Rehabilitation Research

Students who have taken any of the above courses or their equivalent may consult with faculty to request waiver of the required course and to substitute an approved elective.

Other Rehabilitation Courses

- RC 540 Rehabilitation of Business and Industry
- RC 550 Special Topics in Rehabilitation Counseling
- RC 760 Current Issues in Rehabilitation
- RC 782 Directed Independent Study

Support Areas

A support area will be chosen by the student in conjunction with a faculty adviser. Students are encouraged to use their electives to develop 'support areas'. A support area is defined as a group of three or more courses, focusing on one theme, to enhance specific skills or knowledge related to rehabilitation.

Courses comprising a support area may be offered by one or more departments. Support areas available through interdisciplinary planning include: learning disabilities, gerontology, mental health, administration and management, family studies, research and evaluation, group counseling, policy and planning, criminal justice, hearing impairment, visual impairment, recreation and advocacy. Cooperating disciplines include Educational and Counseling Psychology, Social Work, Special Education, Sociology, Public Administration, Family Studies, Psychology, Therapeutic Recreation, and Allied Health.

Admission to Field Work

Admission to field work will be considered after the student has completed the first semester (full time) of graduate study or when the student has completed 12 hours of graduate study. The decision to advance to field work includes successful completion of the admission to field work exam, demonstrated skill in academic areas, and a judgment by the faculty that the student possesses the personal and social characteristics necessary for providing professional rehabilitation counseling services.

Field Work

The first field work component is a three credit practicum, which consists of 180 clock hours of supervised experience in a rehabilitation or rehabilitation-related setting, a weekly seminar, and individual supervision. The practicum is generally offered during the eight-week summer session. A student must be admitted to field work prior to enrolling in practicum.

In accordance with national accreditation and certification requirements, students then complete 600 clock hours of supervised internship in a rehabilitation or rehabilitation-related setting. Every intern student also participates in a weekly seminar and individual supervision. Internship is three credits per 200 clock hours, and may be taken in the summer, fall, or spring semesters following practicum. The internship may be taken in one semester, or may be divided into two semesters.

Students must successfully complete their internship, and demonstrate competence in working with disabled individuals in the context of a professional rehabilitation counseling relationship in order to graduate.

A final written examination is given at the completion of all course work. Graduation is predicated upon the successful completion of this examination.

- 510 Orientation to Rehabilitation Resources.....(3)

- 512 Medical Knowledge for the Social Professions.....(3)
- 520 Principles of Rehabilitation Counseling... (3)
- 530 Psycho-Social Impact of Disability.....(3)
- 540 Rehabilitation in Business and Industry.....(3)
- 550 Special Topics in Rehabilitation.....(1-3)
- 610 Case Management in Rehabilitation Counseling.....(3)
- 620 Vocational Evaluation and Work Adjustment for the Severely Handicapped.....(1-2)
- 630 Placement Services and Techniques in Rehabilitation Counseling.....(1-2)
- 710 Practicum in Rehabilitation Counseling... (3)
- 720 Internship in Rehabilitation Counseling.....(3-9)
- 740 Administration and Supervision in Rehabilitation Counseling.....(3)
- 750 Rehabilitation Research.....(1-3)
- 760 Current Issues in Rehabilitation.....(1-3)
- 782 Directed Independent Study.....(1-3)

Russian and Eastern Studies

Graduate Faculty: Professor Leon Zolondek. Associate Professors Roger B. Anderson and Paul Forand.

At present no graduate program is offered in Russian and Eastern Studies.

Other Departmental Offerings

- 400G Seminar on Special Topics in Russian.....(3)
- 450G Dostoevsky (in English).....(3)
- 460G Tolstoy (in English).....(3)
- 462G Advanced Reading in the Sciences and Technology (in Russian).....(3)

Social Work

Graduate Faculty: Professors Ronda Connaway, S.Zafar Hasan, John Landon, Vernon Wiehe, and Constance P. Wilson. Associate Professors Martha Gentry, and Kennard W. Wellons.

Associate Members: Associate Professors John R. Ballantine, Joanne I. Bell, Richard K. Brautigam, Lauretta F. Byars, Chester A. Holmquist, John Landon, Maryrhea Morelock and Nathan Sullivan. Assistant Professors Surjit S. Dhooper, David D. Roysce and Thanh Van.

Emeritus Professors: Elizabeth Kirlin and Dorothy Miller.

The College of Social Work publishes a bulletin explaining the total program. Please write College of Social Work, Patterson Office Tower, University of Kentucky.

The College of Social Work offers a graduate curriculum of four semesters' duration, leading to the Master of Social Work degree in accordance with Plan B. The MSW degree program is designed to prepare students for careers in the social professions. The College also offers a series of courses in its undergraduate social work program which may be taken for graduate credit by graduate students in other majors.

Students must meet the general require-

ments of The Graduate School, as listed elsewhere in this Bulletin, as well as other specific requirements of the College of Social Work for the Master of Social Work degree as indicated below.

1. Earn 54 hours of credit with a grade-average of B or above. Forty-two of these credits must be in the required social work courses. Four credits will be chosen from additional courses offered within the graduate social work curriculum of the College of Social Work. The remaining 8 credits may be elected from relevant courses offered throughout the University or by the College of Social Work.

Advanced standing of thirteen credit hours may be granted in the Master of Social Work program to graduates of undergraduate social work programs accredited by the Council on Social Work Education who have earned:

- a. grades of A or B in at least four of the five professional foundation areas of the curriculum, namely, Social Work Practice, Human Behavior and Social Environment, Social Welfare Policies and Services, Research, and Field Practicum, and
- b. an overall undergraduate GPA or 2.50 with a 3.00 GPA in social work courses.

Advanced standing may be granted as follows:

- a. They may be permitted to enroll in SW 601-Social Work Practice II (2), SW 621-Human Growth and the Social Environment II (2), SW 631-Social Welfare Policies and Services II (2), and SW 651-Evaluative Research in Social Work (2), waiving SW 600-Social Work Practice I (4), SW 62-Human Growth and the Social Environment I (4), SW 630-Social Welfare Policies and Services I (4), and SW 650-Research in Social Work (2).
2. The MSW degree requires 54 credit hours, at least 28 of which must be taken at the University of Kentucky. Advanced standing of up to one year or 26 credit hours may be granted for work completed at a school accredited by the Council on Social Work Education.
3. Advance to degree candidacy by the end of the first year of graduate study, by completing the College of Social Work advancement-to-candidacy review.
4. Successfully complete the final com-

prehensive examination. This examination consists of an intensive review with students of the total two-year education program to determine their potential capacity for professional practice.

The M.S.W. degree program is accredited by the Council on Social Work Education.

Students are admitted to the M.S.W. degree program in the fall and spring semesters. Applications for admission to the M.S.W. program should be filed on prescribed forms both with the College of Social Work and The Graduate School.

400G	Interventive Methods in Social Work.....	(4)
420G	Perspectives of Human Behavior and the Social Environment.....	(3)
430G	Social Welfare Policy: Theory and Implementation.....	(3)
500	Public Welfare Administration.....	(3)
505	Child Welfare Services.....	(2-3)
510	Mental Health Knowledge for the Social Professions.....	(2-3)
512	Medical Knowledge for the Social Professions.....	(3)
513	Integrated Services for the Handicapped.....	(3)
514	Alcoholism and Problem Drinking.....	(2-3)
523	Social Perspectives on Racism and Ethnic Prejudices in America.....	(2-3)
541	Administration and Supervision in the Social Professions.....	(3)
551	Public Welfare Programs.....	(3)
560	Social Work Practice in Juvenile Justice.....	(3)
561	The Role of Social Work in Criminal Justice.....	(3)
571	Social Work and the Law.....	(3)
580	Topical Seminar in Social Work.....	(2-4)
600	Social Work Practice I.....	(2)
601	Social Work Practice II.....	(2)
602	Social Work Practice with Adults.....	(2)
603	Social Work Practice with Children and Youth.....	(2)
604	Social Work Practice with the Aging.....	(2)
605	Social Work Practice in Health Services.....	(2)
606	Seminar in Criminal Justice Processes.....	(2)
607	Social Work Practice with Families.....	(2)
608	Social Work Practice for Social Reform.....	(2)
609	Clinical Social Work Practice.....	(2)
610	Social Services in Black Communities.....	(3)
611	Social Work Practice in Mental Health.....	(2-3)
612	Seminar on Social Work Practice with Women.....	(2-3)
613	Urban Ecology and Aging.....	(2)
615	Social Work in Work Settings.....	(2-3)
620	Human Growth and the Social Environment I.....	(2)
621	Human Growth and the Social Environment II.....	(2)
622	Group Theory for Social Workers.....	(2)
623	Social Work Practice with Groups.....	(3)
624	Perspectives on Human Sexuality.....	(3)
625	Perspectives on Deviance for Social Workers.....	(2-3)
626	Forensic Mental Health: Evaluation and Treatment.....	(2-3)
630	Social Welfare Policies and Services I.....	(2)
631	Social Welfare Policies and Services II.....	(2)
632	Social Work and the History of Social Reform.....	(2)
633	Social Welfare and the Political Processes.....	(2-3)
634	Comparative Social Welfare Policies and Programs.....	(2-3)
635	Human Service Delivery Systems.....	(3)
636	Management Skills.....	(3)
637	Task Groups in an Organizational Context.....	(2)
640	Graduate Educational Practicum I-A.....	(5)
641	Graduate Educational Practicum I-B.....	(5)
642	Psychological Aspects of Human Aging.....	(3)
643	Biomedical Aspects of Aging.....	(2)
650	Research in Social Work.....	(2)
651	Research Practicum.....	(2)
651	Evaluate Research in Social Work.....	(2)
652	Public Policy and Aging.....	(2)
662	Income Security and Aging.....	(2)
680	Special Problems in Social Work Practice.....	(2-6)
701	Advanced Practice Theory.....	(2)
703	Methods in Social Work Education.....	(3)
706	Selected Issues in Criminal Justice.....	(2)
708	Seminar in Correctional Change Technology.....	(2)
711	Advanced Leadership Roles in Social Work.....	(3)
712	Principles and Methods of Field Instruction in Social Work I.....	(2)
713	Principles and Methods of Field Instruction in Social Work II.....	(2)
720	Organizational and Administrative Theory for Social Workers.....	(2-4)
721	Organization and Management Methods for the Social Professions.....	(2-3)
730	Public Social Policy and the Delivery of Social Services.....	(2)
731	Social Work and Community Planning.....	(2-3)
732	Social Planning and Development.....	(2-3)
740	Graduate Educational Practicum II-A.....	(5)
741	Graduate Educational Practicum II-B.....	(5)
745	Advanced Specialized Educational Practicum.....	(2-4)
750	Seminar on Evaluative Research for the Social Professions.....	(2)
760	Pro-Seminar in Selected Service Areas.....	(2)
770	Seminar on Social Issues and Social Work Practice.....	(2)
780	Independent Work.....	(2-6)
790	Methods in Social Work Research.....	(2-6)

Sociology

Graduate Faculty: Professors Lawrence M. Busch, James Christenson, Richard Clayton, C.M. Coughenour, Thomas Ford, Eugene Gallagher, Thomas Garrity, Jon A. Hendricks, James Hougland, William Kenkel, William B. Lacy, Robert Straus, Harwin Voss and Doris Wilkinson. Associate Professors Walter Abbott, Dwight Billings, Kathleen Blee, Janet L. Bokemeier, Gerry Gairola, Lorraine E. Garkovich, Philip M. Moody, Gerald Slatin, Louis Swanson and Ann Tickamyer. Extension Professor Paul D. Warner.

Associate Members: Associate Professor Richard C. Mauer. Assistant Professors Larry Burmeister, Laurie Hatch, Patrick Mooney, William F. Skinner and Kristen Yount.

Joint Appointments: Professors Billie R. DeWalt and Jon M. Shephard. Associate Professor Alan J. DeYoung.

Emeritus Professors: Howard Beers, A. Lee Coleman, James W. Gladden, Willis A. Sutton, Jr., George Wilbur and Grant Youmans.

Graduates from accredited colleges who meet the requirements of the graduate program in sociology and The Graduate School may work toward the following advanced degrees with major work in sociology: Master of Arts, Master of Science in Agriculture, and Doctor of Philosophy. Both Plan A and Plan B are offered for the Master's degree, and an applied community development option is now available within Plan B. Only one modern foreign language is required for the Ph.D. degree in sociology.

Graduate students pursuing the Ph.D. degree are expected to choose a major area of specialization within sociology and to take work in secondary interests within either sociology or a related area. Areas of specialization in sociology currently stressed are: community and social organization, demography-ecology, deviance, family, medical sociology, rural, social change and development, social gerontology, Appalachian studies and work, gender and inequality. A doctoral program in applied social research has recently been introduced. While core seminars in these specialties are offered, individual program flexibility is maintained so that a student's own interests may develop.

To aid in financing graduate education a considerable number of assistantships are available to qualified students. Outstanding students may compete for fellowships.

Sociologists at the University of Kentucky carry on a substantial variety of research projects, consultative activities, extension education programs and community services. Specialized experience and training are available to graduate students through affiliations with nearby institutions.

Research opportunities within the prisons and other correctional institutions of the state may be arranged. Experience is available in rural sociological research at the Agricultural Experiment Station. Opportunity for applied sociology experience in the Cooperative Extension Service is also available.

The department participates in the University's Center for Developmental Change, which is devoted to interdisciplinary research and training in planned change. Department members are also involved in interdisciplinary research projects sponsored by the University's Appalachian Center. The Department of Behavioral Science, College of Medicine, includes sociologists on its staff and conducts research and other activities of a sociological nature. Sociology graduate students with appropriate interests and training are eligible for assistantships and other

appointments in these several units.

Department standards for admission to graduate work in sociology are similar to those of The Graduate School, including satisfactory scores on the verbal and quantitative tests of the Graduate Record Examination. For additional information on departmental requirements and opportunities for financial assistance write to the Director of Graduate Studies in Sociology.

438G	Juvenile Delinquency.....	(3)
439G	Special Topics in Crime and Delinquency: (Subtitle Required).....	(3)
442G	Topics in Work and Society (Subtitle Required).....	(3)
444G	Social Psychology.....	(3)
451G	History of Sociology.....	(3)
452G	Contemporary Social Theory.....	(3)
493G	Social and Cultural Determinants of Economic Growth and Development.....	(3)
501	Population Analysis.....	(3)
502	Methods of Demographic Analysis.....	(3)
509	The U.S. Family in Historical Perspective.....	(3)
510	Socialization in the Family.....	(3)
517	Rural Sociology.....	(3)
519	Sociology of Urban Life.....	(3)
525	Religion, Society and Culture.....	(3)
527	Society and Health.....	(3)
528	Dimensions of Aging.....	(3)
529	Political Sociology.....	(3)
531	Sociological Analysis of American Society.....	(3)
532	Race and Ethnic Relations.....	(3)
533	Social Anthropology.....	(3)
534	The Southern Appalachians: A Sociological Interpretation.....	(3)
535	Social Classes.....	(3)
540	Collective Behavior and Social Movements.....	(3)
542	Human Relations in Administration of Organizations.....	(3)
545	Small Group Behavior.....	(3)
546	Social Factors in Mental Health.....	(3)
548	Applied Social Psychology.....	(3)
549	Social Processes and Effects of Mass Communication.....	(3)
551	Concepts and Theories in Sociology.....	(3)
561	Comparative Sociology.....	(3)
565	Special Problems in Sociology.....	(1-3)
600	Proseminar in Community.....	(3)
603	Concepts and Methods in Teaching Sociology(1)	
604	Practicum in Teaching Sociology.....	(1)
605	Values, Research, and Public Policy.....	(1)
606	Applied Social Research: An Overview of Types, Uses and Designs.....	(1)
607	Aministering Applied Social Research Programs.....	(1)
608	Interpreting Applied Social Research.....	(1)
610	Proseminar in Complex Organization.....	(3)
620	Sociology of Community Development.....	(3)
622	Topics and Methods of Evaluation.....	(3)
630	Proseminar in Deviant Behavior.....	(3)
635	Proseminar in Work, Gender, and Inequality.....	(3)
637	Sociocultural Dimensions of Economic Development.....	(3)
640	Science, Agriculture, and Development.....	(3)
641	Gender Issues in Development.....	(3)
650	Proseminar in Social Change and Development.....	(3)

651	Sociological Theory in Transition.....	(3)
653	Family Theory and Dynamics.....	(3)
660	Proseminar in Social Demography.....	(3)
661	Sociology of Education.....	(3)
670	Seminar on Role Theory.....	(3)
679	Proseminar in Social Interaction and Social Psychology.....	(3)
680	Methods of Social Investigation.....	(3)
681	Research Design and Analysis.....	(3)
682	Special Topics in Advanced Sociological Methods.....	(1-3)
686	Design of Applied Research: Prognostic Studies and Social Forecasting.....	(2)
687	Social Monitoring.....	(2)
688	Diagnostic Studies in Social Research.....	(2)
695	Social Ecology.....	(3)
700	Special Topics in Community.....	(1-3)
710	Special Topics in Social Organization.....	(1-3)
727	Seminar on Socio-Cultural Change.....	(3)
730	Special Topics in Deviant Behavior.....	(1-3)
731	Seminar in Comparative Social Organization.....	(3)
735	Topical Seminar in Work, Gender, and Inequality (Subtitle Required).....	(3)
738	Seminar: Drug Use as Deviant Behavior.....	(3)
749	Dissertation Research.....	(0)
750	Special Topics in Social Change and Development.....	(1-3)
751	Seminar in Sociological Theory.....	(3)
760	Special Topics in Social Demography and Ecology.....	(1-3)
766	Concepts in Medical Sociology.....	(3)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
772	Topical Seminar in Sociology.....	(3)
773	Topical Seminar.....	(3)
775	Seminar in the Family.....	(3)
776	Seminar in Dependency Behavior.....	(3)
777	Seminar in Mental Illness Concepts, Research and Policy.....	(3)
779	Topical Seminar in Social Psychology.....	(3)
780	Special Problems in Sociology.....	(1-6)
790	Research in Rural Sociology.....	(1-3)
792	Research in Sociology.....	(1-6)
797	Community Development Practicum.....	(1-9)
798	Internship in Applied Social Research.....	(1-9)

Soil Science

Graduate Faculty: Professors R.I. Barnhisel, R.L. Blevins, Wilbur W. Frye, H.F. Massey, D.E. Peaslee, R.E. Phillips, J.L. Ragland, J.L. Sims and G.W. Thomas. Associate Professors V.P. Evangelou, A.D. Karathanasis and Morgan S. Smith.

Associate Members: Assistant Professor John Grove. Extension Professors Lloyd Murdock and Kenneth Wells. Extension Associate Professor William Thom.

Joint Appointments: Professor A.J. Hiatt. Associate Professor George B. Coltharp. Assistant Professor Paul J. Kalisz.

Emeritus Professor: H.H. Bailey.

The Soil Science graduate program offers graduate work leading to the Master of Science, Master of Science in Agriculture, and the Doctor of Philosophy degrees with areas of specialization in soil chemistry, soil fertility, soil genesis, morphology and classi-

fication, soil mineralogy, soil microbiology and soil physics. For the M.S. degree, 24 hours of course work plus an acceptable thesis are required (Plan A). In certain exceptional cases, the requirements for the M.S. in Agriculture may be satisfied by substituting twelve additional hours of course work for the thesis (Plan B).

Work leading to advanced degrees must conform to the general rules and regulations of The Graduate School. A reading knowledge of one foreign language is required for the Ph.D. degree.

Preparation for graduate work in soil science should include some course work in mathematics, chemistry, physical and biological sciences. Students will be expected to make up deficiencies in any of these areas early in the course of their graduate study.

468G	Soil Use and Management.....	(3)
470G	Fertilizers and Soil Fertility.....	(3)
501	Reclamation of Disturbed Land.....	(3)
562	Advanced Genetics.....	(3)
564	Forest Soils.....	(3)
566	Soil Microbiology.....	(3)
573	Soil Morphology and Classification.....	(3)
575	Soil Physics.....	(2)
576	Laboratory in Soil Physics.....	(1)
581	Chemical Analysis of Soils and Plants.....	(4)
597	Special Topics in Agronomy (Subtitle Required).....	(1-3)
660	Advanced Soil Biology.....	(2)
671	Soil Chemistry.....	(4)
675	Advanced Soil Physics.....	(3)
681	Mineralogical and Chemical Analysis of Soils.....	(4)
712	Advance Soil Fertility.....	(3)
721	Pedogenesis and Soil Taxonomy.....	(4)
741	Clay Mineralogy.....	(3)
749	Dissertation Research.....	(0)
768	Residence Credit for Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
770	Agronomy Seminar.....	(1)
799	Research in Agronomy.....	(1-4)

Spanish and Italian Languages and Literatures

Graduate Faculty: Professors John Allen, Brian Dendle, Joseph Jones, Margaret Jones, John Lihani, Daniel Reedy and Gerardo Saenz. Associate Professors Michael Impey, Lawrence Prescott and Edward Stanton.

Associate Member: Assistant Professor Anibal Biglieri.
Emeritus Professor: John E. Keller.

The Department of Spanish and Italian offers the Master of Arts and the Doctor of Philosophy degrees. Graduate Record Examination scores are required for admission. Supervised teaching experience within the department is a requirement for both the master's and doctoral degrees.

MASTER OF ARTS DEGREE

Prerequisites: Attainment in Spanish equivalent to that required for the undergraduate major in Spanish at the University of Kentucky.

Requirements: Standard Graduate School requirements; reading knowledge of a second foreign language; successful completion of 30 hours of course work (Plan B), or successful completion of 24 hours of course work and an acceptable thesis (Plan A). The M.A. written examination is designed to test the candidate's knowledge of the following areas: 1) Hispanic civilization and literary history, 2) the M.A. reading list, and 3) the candidate's composite course work. SPI 502 (Survey of the Spanish Language) is recommended but not required. For individuals who contemplate further work leading to the doctorate, SPI 651 (Bibliography and Methods of Research) is recommended but not required.

DOCTOR OF PHILOSOPHY DEGREE

Recommendations and Requirements: Standard Graduate School requirements; SPI 502 (Survey of the Spanish Language), SPI 601 (Old Spanish I), SPI 602 (Old Spanish II); SPI 651 (Bibliography and Methods of Research) are recommended but not required; a reading knowledge of two languages other than Spanish and English is required; successful completion of written and oral examinations is required for qualification for candidacy for the doctorate (see remarks below); presentation of acceptable dissertation. All candidates for the doctorate are asked to declare an area of special competence, either generic or periodic. It is assumed that the candidate's record will reflect more course work in this area.

Doctoral candidates may choose to organize their special studies either by traditional area-divisions or by genre.

Organization by area: (1) Hispanic linguistics; (2) Medieval Spanish literature and civilization; (3) Renaissance and Golden Age Spanish literature and civilization; (4) Modern Spanish literature and civilization; and (5) Spanish American literature and civilization.

Generic specialization: (1) Hispanic drama; (2) Hispanic prose fiction; (3) Hispanic poetry; (4) Hispanic non-fiction prose and civilization; and (5) Hispanic linguistics.

The term Hispanic includes both Peninsular and Spanish American studies.

The qualifying examinations consist of three written eight-hour examinations (two on all aspects of Hispanic language, literature, and culture, and one on the area

of special competence and related material) and a two-hour oral examination.

438G	Literature of Social Protest in Spanish America.....	(3)
443G	Survey of Italian Literature I.....	(3)
444G	Survey of Italian Literature II.....	(3)
460G	Cervantes in Translation.....	(3)
461G	Rumanian I.....	(3)
462G	Rumanian II.....	(3)
466G	Literary Currents of 20th Century Spanish Literature in Translation.....	(3)
468G	Twentieth Century Spanish American Literature in Translation.....	(3)
501	Spanish Phonetics, Pronunciation and Phonemics.....	(3)
502	Survey of the Spanish Language.....	(3)
503	Structure of the Spanish Language.....	(3)
504	Advanced Spanish Grammar and Composition.....	(3)
505	Advanced Spanish Grammar and Composition.....	(3)
506	Introduction to Comparative Spanish, Portuguese, and Italian Linguistics.....	(3)
508	The Teaching of Spanish.....	(3)
512	Spanish Culture Through the 17th Century.....	(3)
513	Modern Spanish Culture.....	(3)
514	Studies in Spanish American Culture.....	(3)
522	Survey of the Comedia I.....	(3)
523	Survey of the Comedia II.....	(3)
532	The Generation of 1898.....	(3)
541	Spanish American Short Story.....	(3)
543	Survey of Italian Literature I.....	(3)
544	Survey of Italian Literature II.....	(3)
551	Tutorial Seminar for Majors in Spanish.....	(1)
561	Old Italian.....	(3)
563	Dante I.....	(3)
563	Studies in Dante.....	(3)
564	Dante II.....	(3)
566	Literature of the Italian Renaissance.....	(3)
569	Topics in Italian Language, Literature or Culture (Subtitle Required).....	(3)
591	Dante in Translation.....	(3)
593	Modern Italian Literature in Translation.....	(3)
601	Old Spanish: Phonology and Paleography.....	(3)
602	Old Spanish: Morphology and Syntax.....	(3)
611	Medieval Spanish Literature I.....	(3)
612	Medieval Spanish Literature II.....	(3)
613	Spanish Epic and Long Narrative Poetry.....	(3)
614	The Spanish and Spanish American Ballad.....	(3)
615	Spanish Poetry of the Thirteenth, Fourteenth, and Fifteenth Centuries.....	(3)
616	Early Brief Narrative-Thirteenth, Fourteenth, Fifteenth Century.....	(93)
617	Spanish Medieval and Renaissance Drama.....	(3)
621	The Spanish Novel to Cervantes.....	(3)
622	Cervantes I.....	(3)
623	Cervantes II.....	(3)
624	The Spanish Novel from Cervantes to Romanticism.....	(3)
625	Mystic and Ascetic Writers of the Sixteenth and Seventeenth Centuries.....	(3)
626	Lope de Vega and Tirso de Molina.....	(3)
627	The Theatre of Tirso de Molina.....	(3)
628	The Theatre of Calderon de la Barca.....	(3)
629	Spanish Poetry of the Sixteenth and Seventeenth Centuries.....	(3)
631	The Romantic Movement in Spain.....	(3)
632	Spanish Drama from the Generation of 1898 to the Present.....	(3)
633	The Spanish Novel of the Nineteenth Century.....	(3)

634	Prose Fiction from the Generation of 1898 to the Present.....	(3)
635	The Spanish Essay from the Eighteenth Century to the Present.....	(3)
636	Spanish Poetry from the Eighteenth Century through the Generation of 1898..	(3)
637	Spanish Poetry from the Generation of 1927 to the Present.....	(3)
641	Spanish American Drama.....	(3)
642	Spanish American Poetry: Colonial Period to Independence.....	(3)
643	Spanish American Poetry: 1800-1910.....	(3)
644	Spanish American Poetry: 1910 to Present.....	(3)
645	Spanish American Novel: 1800-1910.....	(3)
646	Spanish American Novel: 1910-1940.....	(3)
647	Spanish American Novel: 1940 to Present.....	(3)
648	Literary Currents in Contemporary Spanish American Fiction.....	(3)
649	Spanish American Essay.....	(3)
651	Bibliography and Methods of Research.....	(3)
749	Dissertation Research.....	(0)
768	Residence Credit for Master's Degree.....	(1-6)
769	Residence Credit for Doctor's Degree.....	(0-12)
770	Seminar in Spanish Studies.....	(3)
771	Seminar in Spanish Linguistics.....	(3)
772	Seminar in Medieval Spanish Literature.....	(3)
773	Seminar in Golden Age Non-Dramatic Literature.....	(3)
774	Seminar in Golden Age Theatre.....	(3)
775	Seminar in Modern Spanish Literature....	(3)
776	Seminar in Spanish American Literature.....	(3)
782	Special Studies in Spanish.....	(3)

Special Education

Graduate Faculty: Professors Edward Blackhurst, Melton Martinson and Charles M. Nelson. Associate Professors William Berdine, Charlotte Clark, Donald Cross, Richard Culatta, David Gast, Judith Page, and Mark R. Wolery.

Associate Members: Assistant Professors Deborah A. Bott, Carol Englert, Jo Ellen Fleming, Linda Leeper and Pamela Dianne Smith.

Students may enroll for either degree or certification graduate programs in special education. Programs not leading to a degree are designed primarily for those who are seeking Kentucky Provisional, Rank II or Rank I, Teacher Certification at the graduate level in the following certification areas:

1. Learning and Behavior Disorders
2. Speech Pathology
3. Trainable Mentally Handicapped
4. Severely/Profoundly Handicapped
5. Director of Special Education

Previously certified special education teachers may pursue the standard teaching certificate by selecting an area of emphasis in one of the following:

1. Early Childhood Education for the Handicapped

2. Severely/Profoundly Handicapped
3. Speech Pathology
4. Mild Learning and Behavior Disorders
5. Severe Learning and Behavior Disorders
6. Trainable Mentally Handicapped

The degree programs that are offered lead to the Master of Arts in Education or Master of Science in Education, Specialist in Education and Doctor of Education Degrees. Within the framework of College and University requirements, all advanced graduate degrees are individually planned. This flexibility makes it possible to structure an appropriate program for each student, based upon previous background and career aspirations. Following are brief descriptions of the various graduate degree programs.

To be admitted to candidacy for a master's degree, the following criteria must be met:

1. Grade-point average of 3.0 on at least 12 semester hours of course work, six of which must be at the 600 level or above, excluding practicum.
2. Recommendation by at least one member of the Graduate Faculty.
3. A completed program plan.
4. No incomplete grades.

Minimum hours for the Master of Science in Education Degree are distributed as follows:

Department of Special Education and support areas in College.....	24
Course work outside College of Education..	6
Total	30

It should be noted that these are minimum requirements. Most programs of study exceed the minimums. The Director of Graduate Studies should be contacted to obtain the specific number of courses required for each program of studies.

At least 15 semester hours must be earned in courses at the 600-700 level (excluding practica) and a comprehensive final examination or thesis defense is required. All students are also required to take one course in statistics, methodology of educational research, or single subject research design. Students must also take a course in humanistic studies. With the exception of speech pathology students, a thesis is required of all master's degree students.

Students entering without a teaching certificate must meet deficiencies, including certification requirements, as outlined by their adviser, in addition to completing the degree requirements listed above. Depending on their educational background, students may obtain Rank II Certification concurrently with their master's degree. Students preparing for positions not requiring certification may petition for waiver of certification requirements upon application for admission to the program.

Candidates for the Master of Arts in Education or Master of Science in Education degree with concentration in speech pathology are expected to meet the academic and clinical requirements established by the American Speech and Hearing Association for the Certificate of Clinical Competence. Briefly, these requirements include: (1) a total of 60 semester hours of study, of which at least 30 must be courses acceptable toward a graduate degree; and (2) 300 clock hours of supervised, direct clinical experience with individuals presenting a variety of communication disorders, of which at least 150 hours must be obtained at the graduate level. Master of Arts in Education or Master of Science in Education candidates in speech pathology must complete a minimum of 12 semester hours from the 600-700 level courses in speech pathology and audiology listed under special education. Successful completion of a comprehensive examination in speech pathology is also required.

General requirements for the Specialist in Education (Ed.S) degree have been described in a previous section of this Bulletin. Ed.S. programs are individually planned for in-depth study in an area of special education. Students who hold a Kentucky Rank II Certification are awarded Rank I Certification upon completion of this degree.

The Doctor of Education (Ed.D.) program is designed to prepare leadership personnel for the field of special education. Although various programs of study can be planned, primary emphasis is placed upon training persons for positions in higher education and administration of special education programs. The requirements for this program are described in the Doctor of Education section.

Two major types of financial assistance are available, on a competitive basis, to graduate students in special education.

1. Students may apply for graduate assistantships at all levels of graduate study. These are awarded from funds granted to the Department by the Office of Special Education and Rehabilitation Services, U.S. Department of Education.
2. WHAS Crusade for Children traineeships for full-time study during summer school are available only to Kentucky teachers who are in the process of obtaining Provisional or Standard Certification in an area of special education.

Assistantships and traineeships are awarded on the basis of (1) commitment to the field, as evidenced by previous work experience, references, and/or volunteer service; (2) prior academic record; and (3) financial need. Applications for financial assistance may be obtained from the Depart-

mental Director of Graduate Studies.

502	Development and Evaluation of Instructional Materials in Special Education.....	(3)
510	Early Childhood Education of the Handicapped.....	(3)
511	Speech-Language Development and Disorders for the Severely Handicapped.....	(3)
512	Speech-Development and Disorders for the Mildly Handicapped.....	(3)
513	Legal and Parental Issues in Special Education.....	(3)
515	Career Education in Special Education.....	(3)
516	Principles of Behavior Management and Instruction for Exceptional Learners.....	(3)
517	Prosthetics for Handicapped Children.....	(3)
520	Survey of Severe Developmental Disabilities.....	93
521	Non-Speech Communication.....	(3)
527	Characteristics of the Orthopedically and Neurologically Handicapped.....	(3)
528	Educational Assessment of the Mildly Handicapped.....	(3)
529	Educational Programming for the Mildly Handicapped.....	(3)
530	Characteristics of the Mentally Retarded.....	(3)
541	Characteristics of the Trainable Mentally Handicapped.....	(2)
549	Practicum in the Trainable Mentally Handicapped Classroom.....	(4)
558	Problems in Special Education: (Variable Topic).....	(1-9)
570	Behavior Disorders of Exceptional Children.....	(3)
587	Audiometry.....	(3)
588	Disorders of Articulation.....	(3)
589	Cleft Palate.....	(3)
591	Aural Rehabilitation.....	(3)
592	Problems and Needs of the Hearing Impaired.....	(3)
600	Survey of Special Education.....	(3)
601	Behavioral Management of Exceptional Children.....	(3)
602	Administration and Supervision in Special Education.....	(3)
603	Behavioral Consultation in Schools.....	(3)
610	Educational Evaluation of Exceptional Children.....	(3)
611	Educational Remediation of Learning Disabilities of Exceptional Children.....	(3)
612	Advanced Practicum in Special Education.....	(3-6)
616	Vocational Programming for Handicapped Youth and Adults.....	(3)
620	Instructional Programming in Early Childhood Special Education.....	(3)
621	Issues in Early Childhood Education of the Handicapped.....	(3)
623	Practicum in Early Childhood Education of the Handicapped.....	(3-9)
630	Methods for Teaching the Severely Handicapped.....	(3)
631	Basic Skill Training for the Severely Handicapped.....	(3)
632	Advanced Practicum in Severe Developmental Disabilities.....	(1-12)
633	Single Subject Research Designs in Special Education.....	(3)
647	Language Disorders II.....	(3)
656	Clinical Laboratory in Diagnostic Procedures for Speech and Language.....	(2)
657	Clinical Laboratory in Speech and Language.....	(1-4)
658	Clinical Laboratory in Audiology.....	(1)

659	Clinical Externship in Speech Pathology.....	(1-12)
670	Disorders of Phonation.....	(3)
673	Neurogenic Disorders of Speech and Language.....	(3)
674	Disorders of Fluency.....	(3)
702	Seminar in Speech Pathology (Variable Topic).....	(1-3)
710	Seminar in Mild Learning and Behavioral Disorders.....	(3)
711	Seminar in Severe Developmental Disabilities.....	(3)
712	Seminar in Special Education Professional Services.....	(3)
720	Seminar in Special Education Teacher Preparation.....	(3)
721	Practicum in Special Education Personnel Preparation.....	(3)
730	Seminar in Special Education Administration.....	(1-9)
731	Practicum in Special Education Administration.....	(1-9)
749	Dissertation Research.....	(0)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)
779	Seminar in Special Education (Variable Topic).....	(1-3)
789	Independent Study in Special Education.....	(1-6)
799	Research Techniques in Special Education.....	(3)

Statistics

Graduate Faculty: Professors David Allen, Vasant Bhapkar, Zakkula Govindarajulu, R. J. Kryscio, Harley McKean and Peter Purdue. Associate Professors William S. Griffith, Cidambi Srinivasan and Constance Wood.

Associate Members: Assistant Professors Chern C. Chao, Jonathan P. Cohen, Tom Greene, Marie-Pierre Malice and William Rayens.

Joint Appointment: Professor Paul Cornelius.

The Department of Statistics offers programs of study leading to the degrees of Master of Science (Plan A or B available), and Doctor of Philosophy. The M.S. degree is professionally oriented for the student who plans a career in government, business or industry. The Ph.D. program offers a broad training in both statistical theory and methods while affording options to suit the student's interests. The statistics Ph.D. is well-suited for academic, business, government and industrial positions. In addition to formal course work and research training, the advanced student has opportunities to gain valuable practical experience by participating in consulting activities under faculty supervision.

Course work is available in areas associated with statistics such as biological modelling, computer science, control theory, econometrics, mathematics and operations research.

A student intending to pursue a master's degree in statistics should have one course

each in advanced calculus (equivalent of Mathematics 432 or 471) and matrix algebra (equivalent of Mathematics 462) for the first year's graduate courses. A graduate level course in real analysis (equivalent of Mathematics 571) is a prerequisite for the Ph.D. core curriculum. If possible, mathematical deficiencies should be corrected during the summer prior to entering The Graduate School.

Students with an undergraduate major in any of the mathematical, physical, biological, social or applied sciences are encouraged to apply.

The University of Kentucky is represented on the Committee on Statistics of the Southern Regional Education Board.

MASTER'S PROGRAM

The Department offers the degree of Master of Science with (Plan A) or without (Plan B) a thesis. The core curriculum expected of all master's degree students consists of the following courses:

STA 503.....	(3)
STA 524.....	(3)
STA 531.....	(4)
STA 601.....	(3)
STA 603.....	(4)
STA 624.....	(3)

Programs of study for Plan B require a total of at least 35 semester hours, which should include the equivalent of the six courses in the core curriculum and at least 15 additional credit hours. Of these 15 credit hours, at least 6 should be from the following list of statistics courses:

612, 616, 621,
643, 644, 661, 665

Programs of study for Plan A (with thesis) require a total of at least 29 semester hours, which should include the core curriculum and at least two courses from the previous list. Candidates should also satisfy the requirements that at least 18 hours for Plan B and 15 hours of non-thesis courses for Plan A must be at the 600 level or higher. The free electives courses can be selected from a variety of courses both within and outside the Department of Statistics. Before the end of the second semester, the M.S. candidate must present a proposed plan of study for approval by the Director of Graduate Studies. There are no formal minor requirements.

All master's candidates are required to take a departmental written examination on the core curriculum. These exams are normally administered in August.

DOCTORAL PROGRAM

The doctorate is a research degree that demonstrates independent and comprehen-

sive scholarship and is granted on the basis of broad statistical competence and the exhibition of creative ability. There are thus two components to the doctoral program: 1) a comprehensive program of probability, statistics and related courses, and (2) in depth research in a particular area and the preparation, under faculty supervision, of a dissertation.

The Ph.D. program requires a total of 59 credit hours of course work. The core curriculum consists of the following courses:

STA 503, STA 524, STA 531, STA 601, STA 603, STA 701, STA 702, STA 703, STA 704, MA 571 and an additional two courses selected by the Director of Graduate Studies.

A student will normally require two years of study to complete the core requirements. Beyond the core, the student must take at least 18 credit hours at the 600-700 level of which at least 9 hours must be in statistics courses including 3 hours of STA 690 but excluding STA 692. A reading knowledge of one foreign language is required of all Ph.D. students.

A student must pass the master's examination at a Ph.D. level of performance to be eligible for the doctoral qualifying examination. The qualifying examination consists of two parts: Part I is a common written examination taken by all Ph.D. students, Part II is an oral examination administered to each student individually by the student's Advisory Committee. The written part of the qualifying examination consists of three areas:

Area 1: STA 524, STA 703, STA 704, MA 571

Area 2: SRA 531, STA 601, STA 701, STA 702

Area 3: STA 503, STA 603 and two additional courses selected by the Director of Graduate Studies.

A student must demonstrate competence in two of the three areas.

When a student passes the qualifying examination the Advisory Committee, under the leadership of the student's Major Professor, supervises the subsequent specialized program of study that culminates in the preparation of the doctoral dissertation.

Areas of current research interest are:

- a) Mathematical statistics including statistical inference, categorical data analysis, non-parametric models, asymptotic theory, sequential analysis, decision theory.
- b) Statistical analysis and design including the design of experiments, variance components models, linear

and non-linear models.

- c) Stochastic processes including applications of probability in biology, queueing and storage systems, reliability.

All students, master's and doctoral, will be required to take part in an internship program. This will usually consist of teaching (three of six semester hours) or an equivalent amount of work in the Mathematical Sciences Laboratory.

417G	Principles of Operations Research II.....	(3)
422G	Basic Statistical Theory II.....	(3)
424G	Basic Probability and Distribution Theory.....	(3)
503	Introduction to Statistical Methods.....	(3)
515	Mathematical Programming and Extensions.....	(3)
524	Probability.....	(3)
525	Introductory Statistical Inference.....	(3)
531	Theory of Statistical Inference I.....	(4)
570	Basic Statistical Analysis.....	(4)
601	Theory of Statistical Inference II.....	(3)
603	Introduction to Linear Models and Experimental Design.....	(4)
612	Sequential Analysis.....	(3)
616	Design and Analysis of Sample Surveys.....	(3)
619	Problems Seminar in Operations Research.....	(3)
621	Nonparametric Inference.....	(3)
624	Applied Stochastic Processes.....	(3)
626	Time Series Analysis.....	(3)
630	Bayesian Inference.....	(3)
635	Survivability and Life Testing.....	(3)
641	Design and Analysis for Variance Component Models.....	(3)
642	Response Surface Techniques.....	(3)
643	Advanced Experimental Design.....	(3)
644	Advanced Linear and Nonlinear Models.....	(3)
661	Multivariate Analysis I.....	(3)
665	Analysis of Categorical Data.....	(3)
671	Regression and Correlation.....	(2)
672	Design and Analysis of Experiments.....	(2)
673	Distribution-free Statistical Inference and Analysis of Categorical Data.....	(2)
675	Survey Sampling.....	(2)
676	Quantitative Inheritance in Plant Populations.....	(3)
677	Applied Multivariate Methods.....	(3)
678	Statistical Genetics.....	(3)
679	Design and Analysis of Experiments.....	(3)
681	Statistical Techniques for Engineers and Physical Scientists.....	(3)
690	Seminar in Statistics.....	(1)
691	Special Topics in the Planning and Analysis of Experiments.....	(1-3)
692	Statistical Consulting.....	(3)
695	Special Topics in Statistical Theory.....	(1-3)
701	Advanced Statistical Inference I.....	(3)
702	Advanced Statistical Inference II.....	(3)
703	Advanced Probability.....	(3)
704	Advanced Probability-Stochastic Processes.....	(30)
722	Topics in Nonparametric Inference.....	(3)
749	Dissertation Research.....	(0)
762	Multivariate Analysis II.....	(3)
768	Residence Credit for Master's Degree.....	(1-6)
769	Residence Credit for the Doctor's Degree.....	(0-12)

Theatre

Graduate Faculty: Professor James W. Rodgers. Associate Professor Geraldine Maschio.

Associate Members: Assistant Professors Rhonda Blair and Patrick Kagan-Moore.

Theatre lives at the moment of contact between actor and audience. This department expects its graduate students to approach that moment from several points: historical, critical, practical, theoretical and experimental. Within this framework, each candidate for a master of arts degree must complete a minimum of 30 semester hours. A maximum of six of these may be taken in allied subjects. Graduate students are encouraged to concentrate in one of the following areas: acting, directing, design, production.

It is assumed that a student who seeks a master's degree in the Department of Theatre will have had courses approximating those required for an A.B. degree with a major in theatre arts. If not, the student must remove the deficiency by taking (without graduate credit) courses in addition to those normally specified for the master's degree.

The department offers the master's degree according to Plan B only at the present time.

516	Playwriting.....	(3)
524	Dialects for the Stage.....	(3)
525	Vocal Production for the Stage II.....	(3)
530	Theatre Directing II.....	(3)
580	History of the Theatre I.....	(3)
581	History of the Theatre II.....	(3)
590	Production Practicum.....	(1)
591	Performance Practicum.....	(1-6)
596	Summer Theatre.....	(1-6)
600	Readings in Theatre.....	(3)
625	Advanced Styles of Acting.....	(3)
660	Studies in Technical Theatre: Production.....	(3)
661	Studies in Technical Theatre: Lighting.....	(3)
692	Studies in Directing.....	(1-3)
730	Directing.....	(3)
770	Seminar in Theatre.....	(3)
780	Independent Study in Theatre.....	(1-3)

Toxicology

Graduate Faculty: Professor Craig McClain. Associate Professors Edward J. Kasarskis, Peter R. Oeltgen and Larry Robertson. Adjunct Professor Abraham Hsie.

Associate Members: Assistant Professors Jeffrey Black, Harry G. Enoch and Ronald Ross. Adjunct Associate Professor Gary Gairola. Adjunct Assistant Professors Scott Hamann and Lowell Jeffrey Lawrence.

Joint Appointments: Professors M.H. Aleem, Charles T. Ambrose, Wesley J. Birge, Jerry W. Blake, Raymond Bridges, Shung K. Chan, Ching K. Chow, Douglas L. Dahlman, Donald F. Diedrich, George A. Digenis, James W. Flesher, Arthur Frank, Alan Kaplan, William C. Lubawy, Gerald A. Rosenthal, Malcolm R. Siegel, Thomas Tobin, Thomas Vanaman, Mary Vore, David Watt and Robert A. Yokel. Associate Professors Robert Blouin, Geza Bruckner, Peter Crooks, Vincent Gallic-

chio, Mark Gillespie, Edgar T. Iwamoto, Yih-Loong Lai, Patrick J. McNamara and John Slevin. Assistant Professors Gilbert Boissonneault, Donald Coher, Howard Glauert, Bernhard Hennig, Joseph Holtman, Phillip Jones and Peter Wedlund. Adjunct Associate Professor John Dougherty. Extension Professor Louis Newman.

Emeritus Professors: T.C. Csaky and H.A. Gordon.

Toxicology is a science concerned with the harmful interactions of chemical agents with living systems. The graduate program in toxicology is designed to train individuals to use the biological, physical, and mathematical sciences in the study of the causes, mechanisms, and evaluation of poisoning as well as the sources, identification and quantitation of poisons.

The graduate program in toxicology is administered by the Graduate Center for Toxicology, headed by a director and staffed by faculty with primary appointments either in the center or in various departments of the Medical Center, the College of Agriculture and the School of Biological Sciences. Both the M.S. (Plan A and Plan B) and Ph.D. degrees are offered.

While an interdisciplinary program is located administratively in The Graduate School, great care is taken to assure that graduate students receive training that qualifies them as competent toxicologists rather than as specialists in only one or two of the many areas which are integral parts of toxicology. However, competencies in special sub-disciplines of toxicology are expected of all students and are developed through independent study, course offerings and, most important, by conducting research under the direction of the toxicology faculty. Areas of special study available to students include such fields as analytical toxicology, behavioral toxicology, clinical and forensic toxicology, environmental and aquatic toxicology, environmental medicine and chemistry, equine toxicology, genetic and biochemical toxicology, immunotoxicology, inhalation toxicology, mammalian toxicology, neurotoxicology, nutritional toxicology, oncology, pesticide toxicology, radiation toxicology, and reproductive toxicology.

Applicants should have strong undergraduate preparation in chemistry, biology and mathematics. Applicants should be graduates of accredited colleges with an appropriate baccalaureate degree (e.g. chemistry, biological sciences, etc.), hold a minimum grade-point average of 3.0 on a 4.0 scale, and have a combined Graduate Record Examination score (verbal plus quantitative) of at least 1,100. Applicants with lesser qualifications normally will be accepted only if personally recommended by a member of the toxicology faculty who is

willing to serve as the student's research adviser.

Eligibility for admission to The Graduate School does not insure admission to the toxicology program. Each applicant is considered individually and acceptance into the program depends a great deal on the interest of the applicant and the program's ability to provide training within that particular area of interest. Students with interests beyond the training capabilities of the program are not encouraged to enter the program even if exceptionally qualified academically.

A minimal core curriculum is compulsory, while the total curriculum will be tailored to meet individual needs. Only one modern foreign language is required for the Ph.D. degree in Toxicology.

The Toxicology Graduate Program is included in the Academic Common Market of the Southern Regional Education Board.

606	Insecticide Chemistry and Toxicology.....	(3)
622	Concepts of Toxicology.....	(3)
640	Detoxification Mechanisms.....	(3)
650	Cellular and Histotoxicology.....	(2)
660	Clinical Toxicology and Drug Monitoring.....	(3)
672	Behavioral Pharmacology and Toxicology.....	(2)
680	Advanced Toxicology.....	(5)
690	Practical Analytical Toxicology.....	(3)
749	Dissertation Research.....	(0)
768	Residence Credit for the Master's Degree.....	(1-12)
769	Residence Credit for the Doctor's Degree.....	(0-12)
770	Proseminar in Toxicology.....	(1)
780	Special Problems in Toxicology.....	(2)
790	Research in Toxicology.....	(1-5)

Veterinary Science

Graduate Faculty: Professors George P. Allen, Jerry W. Blake, John Bryans, J.H. Drudge, E.T. Lyons, W.H. McCollum, James Rooney, T.W. Swerczek, Peter Timoney and Thomas Tobin. Associate Professor Ernest F. Bailey.

Associate Members: Associate Professors Ralph Giles, C.B. Hong and Kockananda Poonacha. Assistant Professors Ernest Cothran, Barry Fitzgerald and Kathryn Trembicki. Extension Professor Louis E. Newman.

The Department of Veterinary Science offers a program of study and research leading to the Master of Science (Plan A only) and Doctor of Philosophy degrees. Possible areas of concentration are comparative pathology, parasitology, reproductive physiology, pharmacology and toxicology, immunology and virology. The program is designed for individuals with the Doctor of Veterinary Medicine degree who desire research training in one of the above areas and for qualified graduates of accredited undergraduate institutions. Individuals electing

pathology as their area of concentration must be graduate veterinarians. Individual programs of study must conform with the general rules and regulations of The Graduate School.

A limited number of research assistantships and fellowships are available.

650	Cellular and Histotoxicology.....	(2)
690	Practical Analytical Toxicology.....	(3)
749	Dissertation Research.....	(0)
768	Residence Credit for the Master's Degree.....	(1-6)
769	Residence Credit for Doctor's Degree.....	(0-12)
770	Veterinary Science Seminar.....	(1)
775	Reproductive Physiology Seminar.....	(1)
781	Correlative Pathology.....	(1-3)
785	Advanced Veterinary Parasitology.....	(3)
786	Advanced Veterinary Pathology.....	(3)
791	Techniques in Veterinary Microbiology.....	(1-9)
792	Techniques in General Veterinary Pathology.....	(1-9)
793	Techniques in Veterinary Parasitology.....	(1-9)

Vocational Education

Graduate Faculty: Professors Herbert Bruce, Charles Byers and Clayton Omvig. Associate Professors Sandra Miller, Kawanna Simpson and Rodney W. Tullock.

Associate Member: Assistant Professor Patricia I. Wilson.

Emeritus Professors: Harold Binkley, Bernard Fagan, Carl Lamar, Leonard McDowell, David McMurtry, and Vernon Musselman.

The Department of Vocational Education offers programs leading to the Master of Arts in Education in the areas of business education and distributive education and the Master of Science in Education in the other areas (Plan A and Plan B available), the Specialist in Education (Ed.S.) degree, and the Doctor of Education (Ed.D.) degree. These advanced degree programs are designed to prepare candidates for leadership positions in vocational education—administration, curriculum, teacher education, research, and vocational guidance.

In addition, the department offers programs leading to: (1) the professional certification of administrators, coordinators, and supervisors in vocational education and (2) certification of master's equivalent for Rank II classification (for Kentucky salary purposes) for teaching.

For further information, write the Department of Vocational Education.

MASTER'S DEGREE PROGRAMS IN VOCATIONAL EDUCATION

For a master's degree in vocational education (agricultural education, business education, distributive education, home economics education, industrial education, or voca-

tional education) a minimum of 30 semester hours must be taken with a minimum of 12 hours of graduate work in professional education. At least 12 semester hours shall be taken from three of six areas—I through VI. This program qualifies the teacher for a Standard Certificate if he has completed a four-year undergraduate curriculum.

ALL PROGRAM SERVICE AREAS

- Area II: Research
EDP 522, EDP 656, and EDP 557
- Area III: Advanced Study in Human Development
SOC 542, EDP 600, FAM 654, EDP 603
- Area IV: Psychology of Learning
PSY 502, PSY 550, EDP 548, and EDP 658.
- Area VI: Foundations in Education
EDF 640, EDF 645, EDF 651, EDF 655, and EDF 661 (SOC 661).

AGRICULTURAL EDUCATION

- Area I: Curriculum Development
EDV 672, EDV 678, and EDC 732
- Area V: A Seminar in Instruction Devoted to Method in Teaching
EDV 670, EDV 671, EDV 672, EDV 679, EDV 680, EDV 681, EDV 695, EDV 779, and EDV 789.

BUSINESS EDUCATION

- Area I: Curriculum Development
EDV 615, EDV 626, EDV 678, EDC 714, and EDC 732.
- Area V: A Seminar in Instruction Devoted to Method of Teaching
EDV 511, EDV 512, EDV 615, EDV 618, EDV 695, EDV 779, and EDV 789.

DISTRIBUTIVE EDUCATION

- Area I: Curriculum Development
EDV 517, EDV 678, and EDC 732
- Area V: A Seminar in Instruction Devoted to Method of Teaching
EDV 516, EDV 528, EDV 670, EDV 671, EDV 695, EDV 779, and EDV 789

HOME ECONOMICS EDUCATION

- Area I: Curriculum Development
EDV 678, EDV 685, and EDC 732
- Area V: A Seminar in Instruction Devoted to Method of Teaching
EDV 670, EDV 684, EDV 686, EDV 687, EDV 695, EDV 779, and EDV 789.

INDUSTRIAL EDUCATION

- Area I: Curriculum Development
EDV 678 and EDC 732
- Area V: A Seminar in Instruction Devoted to Method of Teaching
EDV 516, EDV 518, EDV 529, EDV 537, EDV 670, EDV 693, EDV 695, EDV 779, and EDV 789.

VOCATIONAL EDUCATION

- Area I: Curriculum Development
EDV 517, EDV 672, EDV 678, EDV 685, and EDC 732.
- Area V: A Seminar in Instruction Devoted to Method of Teaching
EDV 516, EDV 518, EDV 528, EDV 615, EDV 670, EDV 693, EDV 695, EDV 779, and EDV 789.

THE Ed.S. AND DOCTORAL (Ed.D.) DEGREE PROGRAMS IN VOCATIONAL EDUCATION

For information, write the appropriate director of graduate studies in the Department of Vocational Education. See Graduate School section of Bulletin.

CERTIFICATION OF ADMINISTRATORS, SUPERVISORS AND COORDINATORS OF VOCATIONAL EDUCATION

For certification as an administrator, coordinator, or supervisor of vocational education the student must complete two years of teaching in a vocational teaching assignment, and a minimum of 15 semester hours of graduate level courses above and beyond the course requirements for the 10-year teaching certificate. Courses are to be selected from those listed below, including at least one course in each of the following four curriculum areas.

CURRICULUM AREAS AND COURSES

- I. Organization and Administration of Vocational Education
EDV 535 Principles and Philosophy of Vocational Education.....(2)
EDV 694 Administration of Vocational Education.....(3)
EDV 779 Seminar in Vocational Education.....(1-3)
- II. Administration and Supervision of Education Personnel
EDA 633 Administration and Supervision of Instructional Programs.....(3)
EDA 634 Administration of Educational Personnel (Required in this Area).....3
EDV 608 Internship in Vocational Education.....6
EDV 693 Supervision in Vocational Education.....3
- III. Program Planning, Research, and Evaluation in Vocational Education
EDV 529 Evaluation in Industrial and Distributive Education.....2
EDP 656 Methodology of Educational Research.....(3)
EDP 660 Research Design and Analysis in Education.....3
- IV. Vocational Guidance, Industrial Psychology, Human Relations
EDV 523 Vocational Guidance.....2-3
EDV 702 Career Development, Research Theories and Practice.....2-3
PSY 502 Introduction to Industrial Psychology.....3
- PSY 503 Psychology of Industrial Personnel Procedure.....3
PSY 545 Small Group Behavior.....3
SOC 542 Human Relations in Administration.....3

For information about the certification program, contact the Director of Graduate Studies.

- BUS 519 Records Management.....(3)
BUS 556 Business Communications.....(3)
IND 525 Supervised Work Experience in Business Industry.....(3)
511 Teaching Secretarial Subjects.....(1)
512 Teaching Accounting Subjects.....(1)
513 Teaching Typewriting and Clerical Practice.....(3)
514 Teaching General Business Subjects in the Secondary Schools.....(3)
515 Problems in Distributive Education.....(2-3)
516 Problems of the Coordinator in Vocational Education.....(2-3)
517 Determining Teaching Content in Distributive Education.....(2-3)
518 Methods in Industrial Education.....(2-3)
523 Vocational Guidance.....(2-3)
528 Technique of Teaching Distributive Education.....(2-3)
529 Evaluation in Industrial and Distributive Education.....(2)
535 Principles and Philosophy of Vocational Education.....(2-3)
536 Surveys in Industrial Education.....(2)
537 Special Problems in Industrial Education.....(1-3)
540 Supervision of Student Teaching in Industrial Education.....(2)
580 Materials and Methods for Teaching Vocational Agriculture.....(3)
583 Experience Programs in Vocational Agriculture.....(3)
586 Teaching Home Economics in the Secondary School.....(3)
588 Adult Education in Home Economics.....(3)
590 Problems in Home Economics Education.....(3)
608 Internship in Vocational Education.....(6)
615 Problems in Business Education.....(3)
618 The Social Business Subjects in High School.....(3)
623 Administration and Supervision of Business Education.....(3)
626 Classification and Possible Use of Community Resources in Business Education.....(3)
640 Advanced Methods in the Secretarial Subjects.....(3)
641 Appraisal of Current Literature in Vocational Education.....(3)
670 Method in Teaching Vocational Education.....(3)
671 Youth Organizations in Vocational Education.....(3)
672 Determining Content in Vocational Agriculture.....(3)
678 Selecting Teaching Materials.....(3)
679 Adult Education in Agriculture.....(3)
680 Directing Occupational Experience in Agriculture.....93
681 Teaching Farm Shop.....(3)
684 Current Trends in Home Economics Education.....(3)
685 Home Economics Curriculum Construction.....(3)
686 Evaluation in Home Economics Education.....(3)
687 Home Economics Supervision.....(3)
693 Supervision in Vocational Education.....(3)

- 694 The Administration of Vocational Education(3)
- 695 Special Problems in Vocational Education(3)
- 702 Career Development: Research, Theories and Practices.....(2-3)
- 749 Dissertation Research.....(0)
- 768 Residence Credit for the Master's Degree.....(1-6)
- 769 Residence Credit for the Doctor's Degree.....(0-12)
- 779 Seminar in Vocational Education.....(1-3)
- 789 Independent Work in Vocational Education.....(1-3)
- 799 Research in Vocational Education.....(1-3)

OTHER GRADUATE COURSES

- CEX 501 Principles of Cooperative Extension.....(3)
- CLT 560 Comparative Literature: Grecian and Roman.....(30)

- CLT 561 Comparative Literature: Medieval and Renaissance.....(3)
- CLT 562 Comparative Literature: Seventeenth Through Nineteenth Century.....(3)
- CLT 563 Comparative Literature: Twentieth Century.....(3)
- EGR 537 Numerical Analysis.....(3)
- EGR 599 Topics in Engineering (Subtitle Required).....(1-3)
- EGR 621 Computational Methods in Engineering.....(3)
- EGR 622 Advanced Computational Methods in Engineering.....(3)
- EGR 780 Topics in Engineering (Subtitle Required).....(1-3)
- GRN 513 Geriatric Pharmacy.....(3)
- GRN 612 Biology of Aging.....(3)
- GRN 643 Biomedical Aspects of Aging.....(3)
- IND 525 Supervised Work Experience in Business or Industry.....(3)
- ISP 599 Study Abroad.....(1)
- LIN 515 Phonological Analysis.....(3)
- LIN 516 Grammatical Analysis.....(3)
- LIN 517 Special Topics in Linguistics (Subtitle Required).....(3)

- LIN 519 Historical Linguistics.....(3)
- MD 500 Special Topics Course(1-3)
- MT 501 Seminar in Advanced Hematology....(2)
- PAT 660 Clinical Toxicology and Drug Monitoring.....(3)
- PT 604 Physical Therapy in the Educational Setting.....(3)
- PT 645 Measurement in Physical Therapy.....(3)
- PT 650 Dysfunction of Peripheral Joints.....(3)
- PT 651 Dysfunction of Vertebral Joints.....(3)
- PT 652 Pathomechanics.....(3)
- PT 654 Mechanisms of Motor Control.....(3)
- PT 655 Neuromotor Development.....(3)
- PT 660 Advanced Clinical Practicum in Physical Therapy.....(1-6)
- PT 690 Independent Research in Physical Therapy.....(3)
- PT 695 Independent Study in Physical Therapy.....(1-3)
- PT 768 Residence Credit for the Master's Degree.....(1-6)
- PT 770 Seminar in Physical Therapy.....(3)
- WS 600 Topics in Women's Studies (Subtitle Required).....(3)

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(For specific academic programs see Programs of Graduate Studies on page 38)

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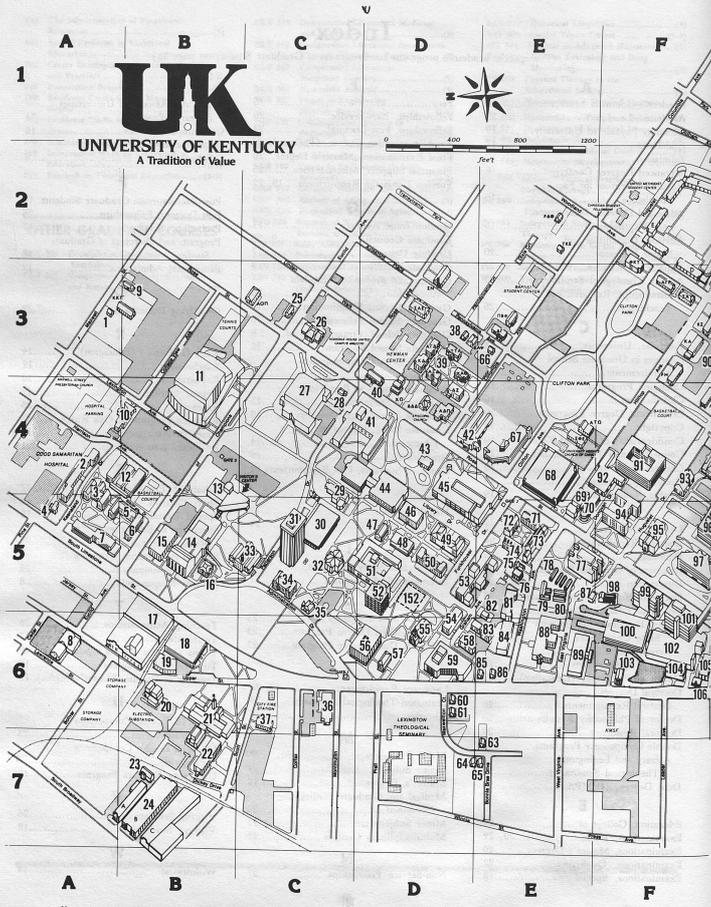
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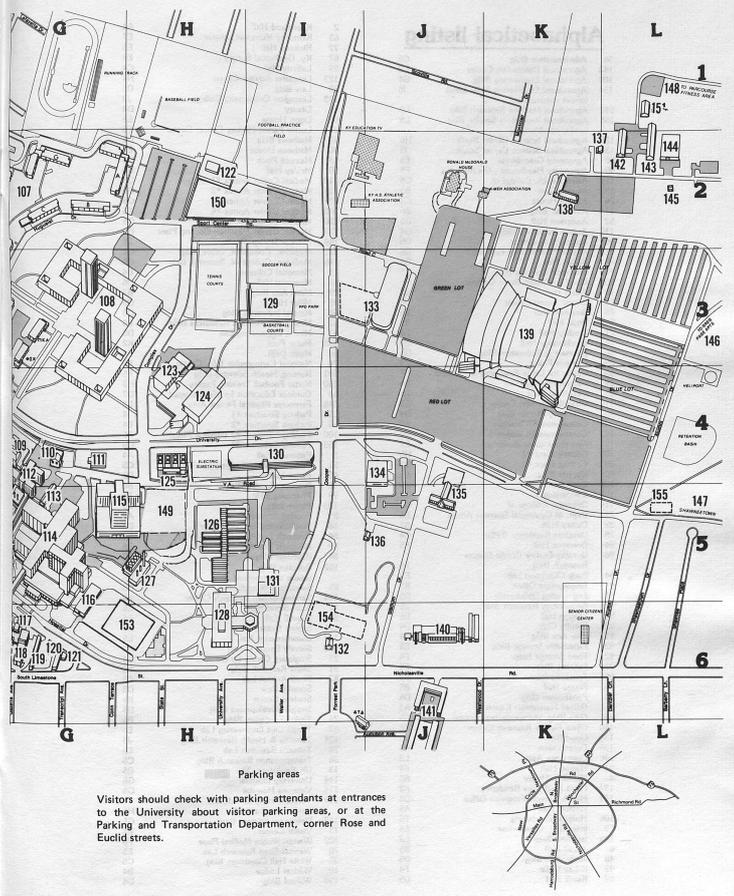
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Map prepared by Cartographic Lab University of Kentucky, Lexington



Parking areas
 Visitors should check with parking attendants at entrances to the University about visitor parking areas, or at the Parking and Transportation Department, corner Rose and Euclid streets.

Alphabetical listing

34	Administration Bldg.	C5
143	Agricultural Distribution Center	L2
109	Agricultural Engineering Bldg.	G4
154	Agricultural Engineering Bldg. (new) (under construction)	I6
142	Agricultural Machine Research Bldg.	L2
155	Agricultural Regulatory Service Bldg. (under construction)	L5
128	Agricultural Science Center North	H6
131	Agricultural Science Center South	I5
80	Agronomy Greenhouse	E5
98	Agronomy Headhouse—Greenhouses	F5
118	Allied Health, College of	G6
15	Alumni Gym	B5
26	Alumni House	C3
17	American Bldg.	B6
52	Anderson Hall	D5
112	Animal Pathology Bldg.	G4
60	Appalachian Center	D6
61	Appalachian College Program	D6
33	Barker Hall	C5
77	Biological Sciences Bldg.	E5
108	Blanding-Kirwan Dorm Complex	G3
12	Blazer Hall	B4
129	Boone Tennis Center	I3
73	Bowman Hall	E5
5	Boyd Hall	B5
71	Bradley Hall	E5
74	Breckinridge Hall	E5
56	Business & Economics Bldg.	D6
25	Campus Police	C3
65	Center for Labor Education & Research	E7
19	Central Heating Plant	B6
69	Centrifuge Bldg.	E5
114	Chandler Medical Center	G5
45	Chemistry-Physics Bldg.	D4
139	Commonwealth Stadium	K3
141	Commonwealth Village	J6
151	Communications Building	L1
125	Cooling Plant #1	H5
20	Cooling Plant #2	B6
95	Cooper Bldg.	F5
132	Cooper House	I6
107	Cooperstown	G2
114	Dentistry, College of	G5
75	Dept. of Geological Sciences Annex	E5
22	Dickey Hall	B7
28	Directors Residence (PPD)	C4
94	Donovan Hall	F5
96	Dorothy Enslow Combs Cancer Research Bldg.	F5
54	Early Childhood Lab	E5
9	Employment Office	B3
51	Engineering Quadrangle	D5
136	Entomology Research Bldg.	J5
54	Erikson Hall	D6
42	Faculty Club	D4
41	Fine Arts Bldg.	D4
82	Flammable Storage Bldg.	E5
92	Food Storage Bldg.	F4
93	Forestry Bldg.	F4
90	Fraternity Row	F3
16	Frazer Hall	B5
53	Funkhouser Bldg.	D5
1	Gaines Humanities Center	A3
35	Gillis Bldg. (Administration Annex)	C5
140	Gluck Equine Research Center	K6
135	Good Barn	J5
126	Greenhouses	H5
146	Greg Page Apts.	L3
91	Haggin Hall	F4
4	Hamilton House	A5
137	Head Mechanics Residence	K2
121	Health Careers Programs Office	G6
7	Holmes Hall	A5
106	Hospital Purchasing	F6
79	Insectory—Greenhouse	E5
145	Isolation Barn	L2
6	Jewell Hall	B5
48	Journalism Bldg.	D5
92	K-Lair Grille	F4
49	Kastle Hall	D5
2	Keeneland Hall	A4
63	Kentucky Municipal League	E7
72	Kinkead Hall	E5
67	Ky. Geological Survey	E4
29	Lafferty Hall	C4
123	Lancaster Aquatic Center	H4
59	Law Bldg.	D6
133	Lexington Community College	J3
44	Library	D4
85	Ligon House	E6
97	Lucille Parker Markey Cancer Center	F5
57	Mathews Bldg.	D6
86	Mathews House	E6
43	Maxwell Place	D4
50	McVey Hall	D5
119	Medical Center Annex #1	G6
118	Medical Center Annex #2	G6
117	Medical Center Annex #3	G6
105	Medical Center Annex #4	F6
120	Medical Center Bookstore	G6
127	Medical Center Heating—Cooling Plant	H5
144	Medical Storage Facility	L2
111	Medicine, College of, Office Bldg.	G4
116	Medicine, College of, Research Bldg.	G5
11	Memorial Coliseum	B4
55	Memorial Hall	D6
23	Metal Arts Bldg.	B7
32	Miller Hall	C5
58	Mineral Industries Bldg.	D6
67	Mining and Minerals Resources Bldg.	E4
47	Mining Engineering Lab	D5
138	Motor Pool	K2
66	Music Dept.	E3
76	National Cartographic Info. Center	E5
101	Nursing/Health Sciences Bldg.	F5
150	Nutter Football Training Facility	H2
64	Outdoor Education for Handicapped	D7
148	Parcourse Physical Fitness Area	L1
130	Parking Structure #1	I4
68	Parking Structure #2	E4
100	Parking Structure #3 (Medical Plaza)	F6
153	Parking Structure #4	G6
3	Patterson Hall	A4
31	Patterson Office Tower	C5
46	Pence Hall	D5
18	Peterson Service Bldg.	B6
99	Pharmacy Bldg.	F5
103	Porter Bldg.	F6
8	Printing Services	A6
38	Psychological Service Center	D3
84	Research Lab #1	E6
89	Research Lab #2	E6
24	Reynolds Bldgs.	B7
152	Robotics Bldg. (under construction)	D5
25	Safety and Security	C3
104	Sanders-Brown Research Center	F6
37	Scott Street Bldg.	C6
88	Scovell Hall	E6
124	Seaton Center	H4
147	Shawneetown Apts.	L5
122	Shively Sports Center	H2
27	Singletary Center for the Arts	C4
81	Slone Research Bldg.	E5
87	Small Animal Lab	E5
39	Sorority Row	D3
14	Student Center	B5
40	Sturgill Development Bldg.	D3
21	Taylor Education Bldg.	B6
83	Terrell Civil Engineering Lab	E6
134	Tobacco & Health Research Bldg.	J4
78	Tobacco Research Lab	E5
36	Transportation Research Bldg.	C6
13	UK Bookstore, The	B5
114	University Hospital	G5
115	Veterans Hospital	G5
149	Veterans Hospital Addition (under construction)	H5
113	Veterinary Science Barn	G5
13	Visitor Center	B4
102	Warren Wright Medical Plaza	F6
70	Wenner-Gren Research Lab	E5
30	White Hall Classroom Bldg.	C5
10	Wildcat Lodge	B4
110	Wilford Bldg.	G4

