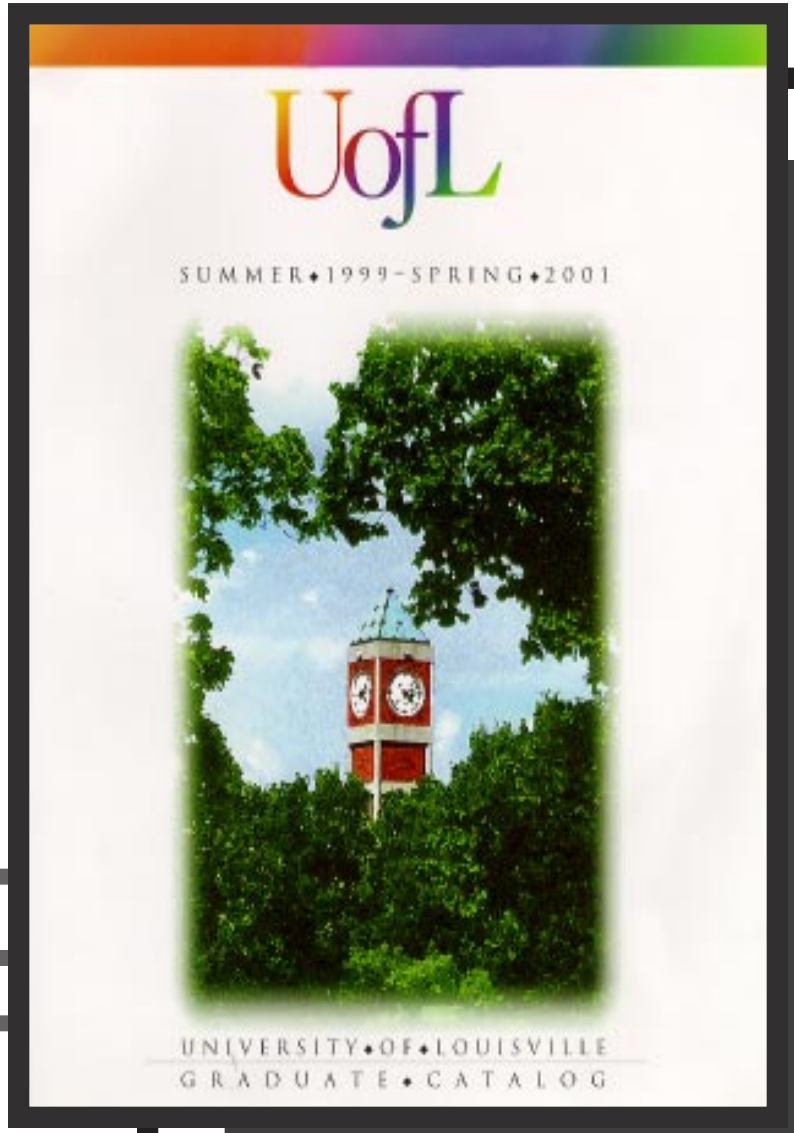

University of Louisville

1999-2001 Graduate Catalog

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UNIVERSITY of LOUISVILLE

Student Services — Registrar's Office
36 Houchens Building
University of Louisville
Louisville, KY 40292
(502) 852–6522

Summer 1999—Spring 2001
Graduate Catalog

Revised June 1999

The University of Louisville is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033–4907; Telephone number (404) 679–4501) to award associate, bachelor, master's, doctoral, and first professional degrees (D.M.D., J.D., M.D.).

The University of Louisville reserves the right to change programs of study, academic policies, academic requirements, fees, schedules of courses, procedures for the confirmation of degrees, or the announced academic calendar without prior notice.

The course descriptions provided herein are for the guidance of students. The University, however, reserves the right to change course descriptions without prior notice.

The provisions of this publication do not constitute an express or implied contract between the University and any member of the student body, faculty, or general public.

The University of Louisville is an equal-opportunity institution and does not discriminate against persons because of race, religion, sex, age, handicap, color, citizenship or national origin.

Inquiries or complaints about illegal discrimination including sexual harrassment or handicap access can be made to the Affirmative Action director (852–6538) if response from the unit staff is unsatisfactory.

The *Redbook* is the official statement of the organizational structure, the rules of governance and procedures and university-wide policies of the University of Louisville. If there is any conflict between the policies, procedures or other statements contained within this catalog, the *Redbook* shall govern. A copy of *The Redbook* is available on the university's web page at www.louisville.edu. Official copies are maintained by all University Libraries, the Student Government Association Office, the student grievance officer, and the vice president for student affairs.

Other policies and information covering students can be found in the Student Handbook.

This publication was prepared by the University of Louisville and printed with state funds. KRS 57.375.

Table of Contents

Academic Calendar

Calendar for 1999–2000

Fall 1999 Semester

Classes start	August 23	Monday
Last day of registration	August 27	Friday
Weekend classes start	August 27, 28, or 29	
Labor Day holiday	September 6	Monday
Last day to apply for degree	September 7	Tuesday
Mid-term break	October 11–12	Monday-Tuesday
Last day to withdraw	October 14	Thursday
Thanksgiving vacation	November 24–28	
End of weekend classes	December 10–12	
End of classes	December 6	Monday
Final examinations	December 8–14	Wednesday-Tuesday
Degree date	December 14	Tuesday

Spring 2000 Semester

Classes start	January 10	Monday
Last day of registration	January 14	Friday
Weekend classes start	January 14, 15, or 16	
Martin Luther King Jr. Day holiday	January 17	Monday
Last day to apply for degree	January 26	Wednesday
Last day to withdraw	February 28	Monday
Spring vacation	March 13–19	
Final Exams:		
for Weekend classes	April 21, 22, or 23	
for other classes	April 26–May 2	
End of classes	April 24	Monday
Reading day	April 25	Tuesday
Commencement	May 13	Saturday

The university reserves the right to change the announced academic calendar without prior notice.

Institutional and Professional Accreditation and Membership

Institutional Accreditation

The University of Louisville is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033–4907; Telephone number (404) 679–4501) to award associate, bachelor, master's, doctoral, and first professional degrees (D.M.D., J.D., M.D.).

Professional Accreditation

The University of Louisville is fully accredited by, or is a member of, the following agencies or organizations:

Accreditation Board for Engineering and Technology

Accreditation Council for Graduate Medical Education

American Art Therapy Association

American Assembly of Collegiate Schools of Business

American Association for the Accreditation of Laboratory Animal Care

American Association for Marriage and Family Therapy

American Association of Colleges of Teacher Education

American Association of Dental Schools

American Association of University Women

American Bar Association

American Chemical Association

American Council on Education

American Federation of Arts

American Mathematical Society

American Medical Association

American Musicological Society

American Nurses Association

American Physical Therapy Association

American Political Science Association

American Psychological Association

American Society for Engineering Education

American Speech-Language-Hearing Association

Association of Academic Health Centers

Association of American Colleges

Association of American Law Schools

Association of Governing Boards of Universities

Bureau of Radiological Health

Commission on Dental Accreditation of the American Dental Association

Committee on Medical Education-Joint Committee of the Association of American Medical Colleges and the American Medical Association on Liaison

Committee on Urban Program Universities

Committee on Allied Health Education and Accreditation of the American Medical Association

Conference of Southern Graduate Schools

Council of Graduate Schools

Council on Postsecondary Education, Commonwealth of Kentucky

Council on Medical Education of the American Medical Association

Council on Social Work Education

Department of Education, Commonwealth of Kentucky

Interuniversity Communications Council (EDUCOM)

Institute of International Education

Kentuckiana Metroversity

Kentucky Academy of Sciences

Kentucky Association of Colleges of Teacher Education

National Association of College and University Business Officers

National Association of Schools of Music

National Association of State Universities and Land Grant Colleges (NASULGC)

National Center for Higher Education Management Systems (NCHEMS)

National Commission for Cooperative Education

National Council for Accreditation of Teacher Education

National Council of University Research Administrators

National League for Nursing

New York Board of Regents

Oak Ridge Associated Universities

Society for College and University Planning

Association of University Technology Managers

Southern Association of College and University Business Officers

Southern University Conference

The University of the State of New York, the State Education Department, Division of Professional Education

General Information

For the New Graduate Student

Graduate School Catalogue

Overview
The University of Louisville operates on a semester system that includes a Fall Semester, Spring Semester, and Summer semester with multiple terms.

The University has a computerized admissions and registration system. Students are advised to include their social security number on all correspondence with the University to facilitate the identification of admission credentials and requests for information.

Students who do not enroll for the semester for which they apply may be required to reapply and resubmit credentials. The University holds credentials on applicants for a limited time.

Student Responsibility

It is the responsibility of the graduate student to become familiar with and observe all policies and requirements of the Graduate School and of his or her particular degree program and department. Policies, procedures, and requirements are subject to change, and it is the responsibility of the graduate student to keep her/himself apprised of current regulations. All students must respond to official notices issued by administrative offices and instructors, whether these notices be posted on official bulletin boards or sent through the mail.

A student's status is not dependent upon a written notification but is a consequence of circumstances in the admission process and the student's academic performance. Written notification is simply a verification of status.

Graduate Credit

Courses listed in this catalog are offered for graduate credit. To receive graduate credit, a student must register for the course through the Graduate School or through another graduate-level program, such as the Master of Engineering, the Master of Science in Social Work, etc.

Students who take these courses as post-baccalaureate or continuing studies registrants do not receive graduate credit.

Prerequisites

Prerequisites for all courses include graduate status and the consent of the graduate advisor for registration. Specific course prerequisites are indicated in the course listing in the curriculum listing of this catalog.

Registration

The University of Louisville uses a touch-tone registration system. Upon admission to Graduate School, each student receives a certificate that may be redeemed for a Schedule of Courses. This Schedule is normally a year-round schedule (Summer, Fall and Spring). Students must first contact their department advisor to discuss course selections. The advising flag is changed within the department.

If a student is in good standing and admitted UNCONDITIONALLY, he/she may proceed with the registration process. If, however, a student still has conditions on his/her admission or is on academic probation, he/she must contact the Graduate Dean's office for further instructions.

A student must participate in touch-tone registration. No in-person registration is permitted. A student may add courses through the touch-tone system through the first week of classes. One may also drop or withdrawal from courses by touch-tone (see Schedule of Courses for appropriate dates).

The Graduate School

The University of Louisville is an urban institution that has had close historical and legal ties with the city of Louisville and Jefferson County. Founded in 1798 as Jefferson Seminary, later known as Louisville College, in 1846 it became the University of Louisville with an academic department and a medical school. Also in 1846, a School of Law was added, and a charter was obtained from the Commonwealth of Kentucky. Under that charter the University has functioned ever since. Currently, it includes the following units: College of Arts and Sciences, Graduate School, School of Dentistry, Speed Scientific School, School of Music, College of Business and Public Administration, School of Education, School of Law, School of Nursing, School of Medicine, School of Allied Health Sciences, and the Kent School of Social Work.

In July of 1970, the University of Louisville officially entered the state university system of the Commonwealth of Kentucky, and thus began a new era of service to community, state, and nation.

Through the Graduate School, the University assumes its responsibility not only to teach but to contribute to the sum of knowledge. It encourages investigation, promotes research, and endeavors to organize the store of human knowledge to serve the needs of present-day life. By fostering the spirit of inquiry and research in the members of its faculties, it not only strengthens undergraduate instruction but also advances knowledge. Through its graduate courses, it furnishes advanced preparation for those who are planning to become investigators or teachers in the social sciences, humanities, and natural sciences. Because of its location in a major metropolitan area, the Graduate School is very much aware of both the research opportunities and the obligations in teaching and public service that such a location presents.

The Graduate School of the University of Louisville was formally established in 1907, although advanced courses were offered by the Schools of Medicine and Law as early as 1856. It is a member of the Council of Graduate Schools.

The legislative functions of the Graduate School are vested in the Graduate Council which consists of elected representatives of the Graduate Faculty. The Council is responsible for establishing policies relating to graduate education and for maintaining a standard of excellence for graduate work within the University. The Dean of the Graduate School serves as chair of this body and of the Graduate Faculty.

The dean and the dean's staff are responsible for the administration of the rules and regulations of the Graduate School and are expected to maintain and safeguard the standards and policies of the school as outlined by the Graduate Faculty and the Graduate Council.

Graduate students participate in the operation and decision-making process of the Graduate School through the Graduate Student Union (to which all Graduate School students belong) and its executive committee, the Graduate Student Council, which consists of one elected representative from each duly constituted graduate student organization. A representative of the Graduate Student Council is a voting member of the Graduate Council. Students are actively sought as members of many of the standing committees of the Graduate School, and they are urged to participate and become involved in the administration of the Graduate School through these channels.

Council on Postsecondary Education Mission Statement for the University of Louisville

The University of Louisville shall serve as Kentucky's urban/metropolitan university. Located in the Commonwealth's largest metropolitan area, it shall serve the specific educational, intellectual, cultural, service and research needs of the greater Louisville region. It has a special obligation to serve the needs of a diverse population, including many ethnic minorities and placebound, part-time, nontraditional students.

Geographic Region
It shall serve as the principal university for instruction, research, and service programs in the Louisville Metropolitan area. In addition, it shall help meet statewide educational, research, and service needs in medicine, dentistry, law, and urban affairs.

Institutional Admissions Standards
The University of Louisville shall admit undergraduate students to its schools and colleges under selective admission standards that exceed the minimum guidelines established by the Council on Postsecondary Education. In addition, U of L shall admit a limited number of undergraduates who shall have an opportunity to remove their academic deficiencies within a limited time according to guidelines established by the Council on Postsecondary Education. Through this approach, the University seeks to provide both broad access and programs of high quality for undergraduates. The University shall admit graduate and professional students using very selective or selective admission standards established by the various graduate and professional schools.

Degree Levels
At the undergraduate level, U of L shall offer selected degree programs closely related to the needs of its urban mission. At the master's level, it shall offer a range of programs responding directly to the advanced educational needs of its metropolitan area. At the doctoral level, it shall offer a limited number of rigorous programs that do not unnecessarily duplicate other doctoral programs in Kentucky. It may offer programs at the associate level, but certificate programs shall not be offered unless they are integral to community college programs, linked to degree programs, or well justified by the human resource needs of the Louisville metropolitan area.

Strategic Directions/Program Priorities
The University of Louisville shall place a high priority on programs that have achieved academic excellence. The University shall build on program strength in business, dentistry, education, engineering, English, environmental studies, law, medicine, music, psychology, and urban affairs. It shall maintain national recognition in selected programs that have already attained such recognition.

These strategic priorities translate into a core of liberal arts baccalaureate programs, in addition to degree program priorities at the baccalaureate (B), master's (M), education specialist (S), doctoral (D), and professional (P) levels that may include the following: — (relevant categories from the Classification of Instructional Programs by degree level are included in brackets): business [B, M - 52]; dentistry [M, D, P - 51]; education [B, M, S, D - 13]; engineering [B, M, D - 14]; English [M, D - 23]; environmental studies [M, D - 26, 40]; law [P - 22]; medicine [M, D, P - 51]; music [B, M, D - 50]; psychology [M, D - 42]; urban affairs [D - 44].

Enhancement of Instruction
The University shall emphasize teaching and educational services to the students admitted to its degree programs. It shall bring the intellectual excitement of research into its instructional programs whenever possible. It shall utilize technology to enhance teaching and increase productivity. It shall adopt teaching methods to serve the needs of students graduated from Kentucky's public schools, a statewide educational system that will change fundamentally as a result of the commonwealth's educational reform efforts.

Research and Service Function
The University of Louisville shall be a research university that places special emphasis on the research and service needs of Kentucky's urban areas. Research shall be encouraged, in particular, as part of doctoral and high-priority programs. Through its research and service efforts, it shall contribute to economic development, educational reform and problem-solving initiatives in the Commonwealth.

Collaborative Ventures
Emphasis shall be placed on cooperative programming with the other state universities. Careful articulation of academic programming at Jefferson Community College and the University shall be developed. The University shall collaborate with the public schools in its service area to further education reform in Kentucky. It shall develop and employ telecommunication resources to communicate with other institutions in the fulfillment of its mission. Undergraduate curriculum development shall emphasize the transfer of credits from other institutions toward degree completion.

Efficiency and Effectiveness
The Board of Trustees shall promote cost effectiveness in academic programming and institutional management. Strategic planning and budgeting shall focus on reallocation and, where appropriate, restructuring to assure the prudent use of resources in maintaining quality, relevant curricula and responsive programming. Processes to measure and evaluate outcomes in major activities shall be undertaken to assure accountability in the University's use of scarce resources. The elimination of duplicative or unproductive programs is essential, while the development of carefully selected new programs, which are consistent with U of L's mission, shall be appropriate. The university shall strive for continuous improvement of its programs and services.*

* SOURCE: Mission Statements on the Higher Education Institutions of Kentucky Commonwealth of Kentucky Council on Postsecondary Education, July 11, 1994, pp.18-19

Structure of the University

In accordance with the statutory authority of the Commonwealth of Kentucky, the Board of Trustees of the University of Louisville shall exercise final jurisdiction over the University. It shall select the President of the University; and upon recommendation of the President, it shall make all appointments of individuals in administrative capacities who serve at the pleasure of the Board. The Board of Trustees shall adopt a budget annually for the ensuing year and grant all degrees conferred by the University.

Administrative Officers of the University

President
John W. Shumaker, Ph.D.

University Provost
Carol Z. Garrison, Ph.D.

Vice President for Finance and Administration
Larry Owsley, M.P.P., M.P.A.

Vice President for Development and Alumni
William J. Rothwell, Ph.D.

Vice President for Health Affairs
Joel A. Kaplan, M.D.

Vice President for Information Technology
Ronald L. Moore, J.D.

Vice President for Research
Nancy C. Martin, Ph.D.

Vice President for Student Affairs
Denise D. Gifford, Ed.D.

Degree Programs

At the present time the following programs for advanced degrees are available.

Doctor of Philosophy (Ph.D.) with majors in:

1. Anatomical Sciences & Neurobiology
2. Art History
3. Biochemistry
4. Chemical Engineering
5. Chemistry
6. Clinical Psychology
7. Computer Science and Engineering
8. English/Rhetoric and Composition
9. Environmental Biology
10. Experimental Psychology
11. Industrial Engineering
12. Microbiology and Immunology
13. Pharmacology and Toxicology
14. Physiology and Biophysics
15. Social Work
16. Urban and Public Affairs
17. Visual Sciences

Cooperative Ph.D. Programs
The University of Louisville is authorized to cooperate with the University of Kentucky in offering the Ph.D. in three areas: *civil engineering, musicology* and *physics.* For more information, see the appropriate program section of this catalog.

Doctor of Education (Ed.D.)
The Ed.D. is a 90-hour (minimum) degree program.

The five curriculum areas available are:

1. Counseling & Personnel Services
2. Educational Administration
3. Educational Supervision
4. Evaluation
5. Special Education

Cooperative Ed.D. Program
The University of Louisville participates in a cooperative Ed.D. program in education administration with Western Kentucky University. To enroll in this program, a student must be admitted to both institutions. Those who complete the program will receive a diploma that states that the degree is awarded by the University of Louisville in cooperation with Western Kentucky University.

Doctor of Audiology (Au.D.)

Master of Fine Arts (M.F.A.) with major in Theatre Arts

Specialist in Education (Ed.S.)
The Ed.S. is a 30-hour degree program beyond the master's. The Ed.S. course work may be acceptable toward the Ed.D. The Ed.S. is offered with majors in:

1. Counseling & Personnel Services
2. Educational Administration
   a. Principalship
   b. Superintendent
   c. Supervision
3. Elementary Education
4. Higher Education

Master of Arts (M.A.) with majors in:

1. Art, Creative
2. Art History
3. Art Therapy
4. English
5. Foreign Language Education
6. French
7. German
8. Higher Education
9. Higher Education with concentration in Sport Administration
10. History
11. Humanities
12. Interdisciplinary Studies
13. Linguistics
14. Mathematics
15. Music History
16. Philosophy
17. Political Science
18. Psychology
19. Sociology
20. Spanish
21. Theatre Arts

Master of Science (M.S.) with majors in:

1. Administration of Justice
2. Anatomical Sciences & Neurobiology
3. Applied Mathematics
4. Biochemistry
5. Biology
6. Chemical Engineering
7. Chemistry
8. Civil Engineering
9. Communicative Disorders
10. Computer Science
11. Electrical Engineering
12. Exercise Physiology
13. Industrial Engineering
14. Interdisciplinary Studies
15. Mechanical Engineering
16. Microbiology and Immunology
17. Oral Biology
18. Pharmacology and Toxicology
19. Physics
20. Physiology and Biophysics
21. Special Education

Combined Master of Science and Doctor of Medicine (M.S.-M.D.)

Combined Master of Science and Doctor of Dental Medicine (M.S.-D.M.D.)

Master of Education (M.Ed.) with majors in:

1. Counseling & Personnel Services with concentrations in:
   a. Counseling Psychology
   b. Elementary School Counseling
   c. Secondary School Counseling
   d. Student Personnel Services
   e. Community Counseling
2. Early Childhood Education
3. Early Childhood Education with a concentration in Early Childhood/Special Education
4. Early Elementary Education
5. Middle School Education
6. Physical Education
7. Occupational Education
8. Occupational Training & Development
9. Reading Education with concentrations in Elementary Reading and Secondary Reading
10. Secondary Education
11. Special Education or Special Education with one of the following concentrations:
    1. Early Childhood/Special Education
    2. Learning & Behavior Disorders
    3. Learning Disabilities
    4. Mental Retardation
    5. Visual Impairment
    6. Moderate and Severe Disabilities

Master of Arts in Teaching (M.A.T.) with majors in:
1. Art Education
2. Early Elementary Education
3. Middle Grades Education
4. Music Education
5. Physical Education
6. Secondary Education

Master of Music (M.M.) with majors in:
1. Performance
2. Music History
3. Theory-Composition

Master of Music Education (M.M.Ed.)

Master of Business Administration (M.B.A.)

Master of Accountancy (M. Ac.)
The objective of the M. Ac. program is to prepare students for careers in public accounting and professional services. The program is designed to meet all of the educational requirements to become a Certified Public Accountant in any state.

For information contact:
Student Academic Support Services Office
College of Business & Public Administration
Room 039, 502-852-7439

Master of Science in Nursing (M.S.N.)

Master of Public Administration (M.P.A.)

Master of Science in Social Work (M.S.S.W.)

Combined Master of Business Administration and Juris Doctor (M.B.A.-J.D.)

Combined Master of Business Administration and Mechanical Engineering (M.B.A.-MEng)

Master of Physical Therapy (M.P.T.)

NOTE: The Master of Physical Therapy program is a 3+2 degree requiring a minimum of 90 undergraduate hours. Students interested in the M.P.T degree should *contact* the program directly.

Interdisciplinary Degrees
At the master's level, it is possible to establish interdisciplinary programs for individual students in the areas not represented by the traditional disciplines.

Application to the Graduate School

Application Credentials
Each of the credentials listed below should be sent to the Office of Admissions at least six weeks prior to the beginning of the semester or summer session in which the student wishes to enroll; otherwise the application may not be reviewed in time for registration. Six weeks is a general deadline. Any program may have a different deadline and may require additional credentials or higher standards than those described in this General Information Section. Applicants should consult the pertinent departmental section of this catalog.

Application for admission
Application forms may be obtained from the Graduate School or the Office of Admissions. Application must be accompanied with a $25.00 non-refundable application fee. The *Graduate School application* may be submitted on-line via the world-wide web at www.louisville.edu. However, applications are not processed until the application fee is received.

Transcripts
The minimum requirement for admission is the baccalaureate degree or its equivalent from an accredited institution; however, official transcripts showing all degrees awarded on all undergraduate and all graduate work completed must be furnished. All University of Louisville transcripts will automatically be submitted with the application. The baccalaureate degree-showing transcript must be submitted before the end of the student's first graduate semester.

Applicants to non-degree or certificate programs in Education need only submit an official transcript certifying at least a baccalaureate degee.

Recommendations
At least two letters of recommendation from individuals who can speak to the applicant's academic and/or professional capabilities and potential are required.

Applicants applying for non-degree or visitor status are not required to submit letters of recommendation.

Examination scores
Each applicant is required to take the General Test Section of the Graduate Record Examination (GRE) and must instruct the Educational Testing Service to forward the results to the Office of Admissions, Belknap Campus, University of Louisville, Louisville, Kentucky, 40292. The Subject Test Section may be required at the discretion of a department, and the applicant should consult the pertinent departmental section of this catalog.

Kent School applicants are not required to submit GRE or GMAT scores. However, applicants to Kent School with a cumulative gpa of less than 2.5/4.0 must submit a Miller Analogies Test score.

Applicants for the Master of Business Administration degree program are exempt from the GRE but must take the Graduate Management Admissions Test (GMAT) prior to consideration for admission.

Information about the times and places for taking these examinations may be obtained from the University Testing Service, University of Louisville, or from the *Educational Testing Service,* Princeton, New Jersey, 08540.

Applicants applying for non-degree or visitor status are not required to submit test scores.

Students enrolled jointly in a Graduate School degree program and in a Medical School degree program may substitute the Medical College Admissions Test for the Graduate Record Examination with the approval of their department chair or graduate program advisor.

International Students
International student applicants must meet three criteria before they can be granted admission: (1) they must meet the regular admissions standards as applied to all successful applicants, (2) they must show proficiency in English by submitting official TOEFL scores of 550 or higher on the paper-based test or 213 or higher on the computer-based test or successfully completing the exit examination for the advanced level of the Intensive English as a Second Language Program at the University of Louisville, and (3) they must present evidence of financial resources adequate to support their educational and living expenses in the United States for the duration of their studies. The award of a University Fellowship or Graduate Assistantship is considered evidence of adequate financial resources.

TOEFL Examination
This examination is required of all international students from countries in which English is not the native language. Students holding a baccalaureate or advanced degree from an accredited institution in the United States are exempt from this requirement. Information about the times and places for the examination may be obtained from the Educational Testing Service, TOEFL, Princeton, New Jersey 08540.

Applicants who have not scored 550 (paper-based)/213 (computer-based) or more on the TOEFL Examination may choose to apply to the Intensive English as a Second Language Program. Successful completion of the Advanced Level of this program will be considered adequate proof of the English proficiency required for course work in the chosen graduate program. Acceptance to the Intensive English Program does not constitute acceptance to the Graduate School. For information and application forms, write to: IESL, University of Louisville, Louisville, Kentucky 40292, U.S.A.

Test of Spoken English
Students whose native language is not an American or British Dialect of English may not be awarded teaching assistantships unless they present an acceptable score on the Test of Spoken English (TSE) or a locally administered teaching competency demonstration. Applications and information about the times and places for the TSE may be obtained from Test of English as a Foreign Language, P.O. Box 6151, Princeton, N.J. 08541 USA. The teaching competency demonstration is given by appointment at the University Testing Service.

Admission Statuses

Upon evaluation of the application credentials, the department in which the applicant wishes to enroll forwards a recommendation concerning admission to the Dean of the Graduate School. A recommendation for admission will specify either of two statuses. Many departments communicate directly with prospective students; however, the official admission letter will come from the Dean of the Graduate School.

Degree status
In order for a student to be recommended unconditionally for admission to degree status, all admission credentials must have been received and evaluated. The applicant must have earned a grade-point average of at least 2.75 on a 4-point scale in either his/her complete undergraduate program or the senior-college years.

Each student in this classification is a prospective candidate for an advanced degree and is expected to pursue a program leading to the master's degree, specialist's degree, or doctoral degree. Each applicant should consult the departmental sections of this catalog to determine any additional admissions criteria or any more restrictive requirements for admission to this status.

Degree status - conditional
This status is intended for students who have furnished their application and baccalaureate transcript but whose remaining application materials are incomplete, or for students whose credentials have all been received but who fail to meet the Graduate School's general requirements and/or specific departmental requirements for unconditional admission. A transcript showing the award of a baccalaureate degree must be submitted before the end of the student's first graduate semester.

A student has one semester to furnish any missing admission credentials and clear any conditions made at the time of admission. Failure to complete the admission process within a semester may result in refusal of permission to register in the next semester.

A student who does not have a 2.75 undergraduate grade-point average should consult with the major department in the intended area of study. Some departments have optional provisions that may lead to reconsideration of such applicants.

A student admitted with an undergraduate point standing of less than 2.75 may be subject to departmental limitations on the number of hours in which he/she may enroll for each semester. Graduate credits earned prior to achieving good academic standing are not automatically applicable to the degree program.

Probation
All students admitted with a point standing below 2.75 will be considered "on probation." This means that if they do not receive a "B" average for their first semester they may be subject to dismissal.

No student with a grade-point average of less than 2.50 will be admitted to graduate study. Under unusual circumstances, exceptions to this policy may be made upon specific recommendation and documented justification for admission by the department chairman or graduate program advisor. Such justification must be provided in writing to the graduate dean, who must approve or disapprove the recommendation.

Nondegree status
Students who do not desire to seek an advanced degree may enroll under nondegree status. Application credentials must include the application form and an undergraduate transcript showing the award of baccalaureate degree. Students may accumulate a maximum of fifteen hours while in nondegree status. The only regular exceptions to this policy are the Rank I and Rank II programs in the School of Education, the Nurse Practitioner program in the School of Nursing and the post-master's program in Family Therapy.

Students admitted in this status who wish to become degree candidates must submit all required admission credentials, including a reapplication. Such applicants must meet all general standards for admission to the Graduate School as well as any established by the appropriate department. After admission to degree status, only six hours of course work taken while in nondegree status may be applied to the degree (Any application of hours toward a particular degree is always subject to departmental approval.)

Auditors
Auditing at the graduate level is available only to persons who are enrolled in at least one course for credit, unless permission to audit only is granted by the Dean of the Graduate School. The fee for auditing a course is equal to the tuition for enrolling in the class for credit.

The Graduate School does not require that auditors take examinations, submit papers, or take part in any evaluative activity. However, the instructor, at his or her discretion, may demand or deny the auditor's participation in class to whatever extent is deemed desirable. A "W" (Withdrawn) shall appear on the transcript unless a student attends at least 75% of the classes.

Some departments may not permit auditing at the graduate level. Students wishing to audit courses must obtain permission in writing from the appropriate instructor. Forms are available at the Graduate Dean's Office.

A graduate student may not satisfy by audit a stated prerequisite for a graduate course or a stated degree requirement.

Visiting Students
University of Louisville graduate students who attend another Graduate School as a Visiting Student must have the permission of their department chair or advisor before the courses are taken in order to transfer credits earned. Visiting student status may be granted only to a student who is in good standing.

A graduate student from another school may enroll for graduate course work as a "visiting student" at the University of Louisville by submitting an application and providing a statement from the dean of his or her graduate school certifying that the student is in good academic standing and approving the transfer of credits to that school at the end of the semester.

Academic Standing

Good Standing
A graduate student is in good standing when his/her overall graduate grade point average and his/her program grade point average are each 3.0 or higher. A student must be in good standing in order to be graduated.

When a graduate student completes a degree program (or a Rank II or Rank I program), the grade point calculation does not include the previous degree courses unless these courses apply to the subsequent higher level degree, e.g., M.A., in English followed by a Ph.D. in English.

Probation
A student whose program GPA or overall graduate GPA falls below a minimum level of academic quality (3.0 on a 4-point scale) will be placed on probation until the student regains a 3.0 average or is dismissed. Students are ordinarily not permitted to continue on probation for more than one semester. Upon request of the student's academic department, the Graduate Dean may approve continuation beyond a single semester.

University GPA
The University's computerized Student Information System provides for three "career" transcripts: undergraduate, graduate, and professional. A University GPA is maintained in each career and includes all courses completed through that career. The University GPA may differ from the GPA used to determine good standing in the Graduate School.

Overall Graduate GPA
The overall graduate GPA is the grade point average for all graduate-level courses taken while a graduate student. When a student completes a degree program (or Rank II/Rank I program) subsequent grade point calculation does not include the previous degree courses unless these courses also apply to a subsequent higher level degree program, e.g., an M.A. in English followed by an Ph.D. in English.

Program GPA
The program GPA is the grade point average based upon those graduate-level courses that have been approved by a student's academic department as constituting his/her program of study for a specified graduate degree (or Rank II/Rank I program).

Plagiarism and Cheating
It is expected that a student in the Graduate School will refrain from plagiarism and cheating. Plagiarism and cheating are serious breaches of academic conduct and may result in permanent dismissal. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the *Code of Student Rights and Responsibilities.* A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty.

General Academic Policies and Requirements

The general policies and requirements for advanced degrees are stated below; however, each advanced degree has specific requirements, particular to that degree, which are detailed in the following descriptions. Also, individual departments may have requirements particular to their advanced degree programs. These requirements are stated in the respective program sections of this catalog and must be consulted, so that the graduate student may be fully apprised of the conditions he/she must meet in order to receive an advanced degree.

The policies and regulations described in this catalog cannot be superseded or invalidated by either oral or written agreement with faculty, staff, or administrators, unless such agreement is confirmed in writing by the Dean of the Graduate School.

Student Responsibility
It is the responsibility of the graduate student to become familiar with and observe all policies and requirements of the Graduate School and of his or her particular degree program and department. Policies, procedures, and requirements are subject to change, and it is the responsibility of the graduate student to keep her/himself apprised of current regulations. All students must respond to official notices issued by administrative offices and instructors, whether these notices be posted on official bulletin boards or sent through the mail.

Credit Requirements
For both the master's and doctoral degree programs, a minimum of 24 semester hours of credit must be taken on campus at the University of Louisville. A minimum total of 30 semester hours of graduate credit is required for a master's degree; some require additional hours. Credits that have been applied to a baccalaureate or master's degree may not be applied to a subsequent master's degree .

The Doctor of Education degree requires a minimum of 90 semester hours of post-baccalaureate courses. Some credits earned toward a master's degree may apply to this minimum. This must be determined by the School of Education, Dean's Office.

The award of a Doctor of Philosophy degree indicates that a student has attained mastery of a field and has demonstrated the capacity to perform independent scholarly research and to appreciate the importance of that research within the broad context of his or her discipline. Accordingly, no specific minimum number of credit hours has been established for Ph.D. programs. However, it has been customary to consider the equivalent of three years of full-time graduate study as minimal.

Course Loads
Unless a department or program requires a larger number of hours for all full-time students, the maximum number of hours that may be taken in a regular semester is 12; or 15 hours if 3 or more hours are research credit. The maximum number of hours that may be taken in the summer session (both terms) is 12, including research hours.

Overloads
Any student wishing to enroll in more than the maximum number of hours must obtain the permission of the Dean of the Graduate School. Permission to enroll for excess hours is rarely granted.

Full-and Part-Time Study
Full-time study is defined as being 9 hours of credit during a regular semester or during the summer term. To be considered in full-time residency for one year, a student must be registered for 9 hours in each of two consecutive semesters.

Satisfactory Progress
All graduate students are expected to make steady and satisfactory progress toward the completion of degrees. Students who fail to enroll for a period of more than 12 months will be considered to have withdrawn from the program. Students who seek to return after such a period of time are required to apply to their departments for readmission. Based on the request of the department, the Dean of the Graduate School will consider the student for readmission.

Satisfactory progress also involves maintaining the standards of academic and professional integrity expected in a particular discipline or program and, in some disciplines, may include demonstration of the ability to function as a professional practitioner. Failure to maintain these standards or demonstrate such abilities may result in termination of the student's admission to the program.

Full-Time Study for University Fellows and Graduate Assistants
All University Fellows are required to complete 12 hours of credit in both the Fall and Spring semesters. Summer enrollment is preferred but not required. Graduate assistants are expected to enroll as full-time students during the year(s) of their appointment.

Candidacy
Generally speaking, a master's degree student becomes a candidate for the degree upon approval of a program of study by his/her graduate committee or graduate department. A doctoral student becomes a candidate upon successful completion of the qualifying examination, which is taken after satisfactorily completing the major portion of the prescribed course work, and the foreign language requirement, if applicable.

Once a doctoral student is admitted to Candidacy he/she must maintain continuous registration by enrolling for courses or paying the doctoral candidacy status fee (see following section).

Maintaining Candidacy
Registration in candidacy status is not the same as admission to degree candidacy (see preceding section). Registration in candidacy status is a means of maintaining continuous registration and is required of all master's, specialist, and doctoral students after they have registered for all of their degree courses.

Registration in candidacy status must be maintained year round (Fall, Spring, and Summer) until the degree is awarded. The candidacy status fee is $20 per semester for master's and specialist students and $50 per semester for doctoral students. A student building fee of $7.50 and a university facility fee of $7.50 per semester is also charged to students who register in candidacy.

Once a student registers for candidacy he/she may not thereafter register for additional courses. Exceptions may, in unusual circumstances, be granted by the Dean of the Graduate School upon written request from the student's department.

Failure to pay the registration fee will be cause to cancel a student's candidacy. In order to restore it, the student must receive the approval of the head of the major department and that of Graduate Dean. For each of the semesters during which his/her candidacy was void, the student will be required to pay the Status Fee (master's or doctoral) plus a reinstatement fee of $25.

Microfilming and Copyrighting
The University of Louisville, by action of its graduate faculty, requires that all theses and dissertations be microfilmed. Copyrighting the paper is an optional choice for its author. Candidates for advanced degrees that require theses or dissertations must submit agreements for microfilming and copyright applications on the appropriate forms supplied by the Graduate School Office. A completed application, one extra copy of the abstract, and one extra copy of the title page must accompany the unbound copies of each dissertation or thesis. The extra copies of the abstract and title page are used by University Microfilms in its abstracting journals. A limitation of 350 words is set on the abstracts for doctoral dissertations and 150 words for theses for master's or Ed.S. degrees.

Application for Degrees
Degrees are awarded in August, December, and May. Candidates who expect to receive degrees on a particular award date must submit their completed application for degrees to the Office of the Graduate School on or before the dates specified in the University calendar (see Schedule of Courses).

Transfer of Credit
Earned graduate credit may be transferred from accredited institutions that offer advanced degrees. The maximum number of semester hours transferable, upon request, is 6. Up to 6 additional hours may be requested, in a master's program, provided that these additional hours are not credit earned by extension, and provided also that the residency requirement of 24 semester hours is maintained by the addition of University of Louisville credits to the total program.

In unusual circumstances, a lesser residency credit requirement may be considered by the Graduate Council. Requests for such exceptions must be supported by the major department and the program advisor. In no case will a master's degree be awarded to a candidate who has completed fewer than 18 semester hours at the University of Louisville. Final approval rests with the Graduate Council.

Credit earned more than six years prior to the student's application to the Graduate School of the University of Louisville will not normally be considered for transfer; however, the Graduate Council and the Dean may make an exception upon the recommendation of the student's department.

The course work being considered for transfer must have been taken while the student was enrolled in an accredited graduate school and must be evaluated for transfer by the head of the department in which the student is seeking additional graduate work. Six hours may be transferred from previously earned master's degrees toward a second master's degree, subject to the approval of the second degree program. Hours earned toward a culminating experience such as a thesis, practicum, or internship shall not be transferable to the second master's degree. Only courses in which the student earned grades of "B" or better will be considered for transfer. Hours and quality points earned at other institutions are not included in the calculation of a student's GPA.

Courses in which grades of "P" were earned must have the approval of the Graduate Dean in order to be transferred. In case of question regarding the transferability of course work, the Graduate Council is empowered to decide.

Transfers of credit from constituent schools and colleges of the University of Louisville are not subject to the above limitations on transfers but requires the recommendation of the student's department and the approval of the Dean of the Graduate School.

Course Numbering System
Courses with numbers from 500 to 599 may be open to both advanced undergraduate and graduate students and can be taken by graduate students for graduate credit. Those numbered 600 and above are primarily for graduate students.

Students who wish to receive graduate credit for 500-level courses must demonstrate a level of mastery of the course material substantially above that required for undergraduate credit. This mastery must be verified in writing by the instructor if graduate credit is requested after course is completed.

Demonstration of an appropriate degree of mastery may include term papers, independent study, comprehensive examinations, or other more stringent requirements than those applied for undergraduate credit. The nature of the differences between the requirements for graduate credit and those for undergraduate credit must be described in course syllabi.

Only those 500-level courses that appear in this catalog are available for Graduate School credit. The student is advised to consult his/her department for information on any particular 500-level course.

Undergraduates Taking Graduate Courses
Undergraduate students with special permission of their undergraduate dean, the Dean of the Graduate School, and the instructors in the courses involved may register in graduate courses, including those at the 600 level. It is understood that such courses will replace courses in the normal undergraduate curriculum and therefore cannot be used for subsequent graduate credit.

Undergraduate students at the University of Louisville who are within 6 semester hours of completing the baccalaureate requirements may register in graduate courses, including those at the 600 level, with the permission of the undergraduate dean, the Dean of the Graduate School, and the instructors involved. Subsequent graduate credit can be obtained only if these courses have not been used to satisfy part of baccalaureate requirements, and if the recommendation of the chairman of the department involved and the approval of the graduate dean are obtained.

Grades and Grading

University GPA
The University GPA may not be identical with the GPA used to determine good standing in the Graduate School (see *Academic Standing).*

Grade-point averages are calculated by dividing the quality points earned by the number of credit hours attempted with grade.

Grading System
The Graduate School has implemented a plus/minus grading system, to be utilized at the discretion of the individual professor. The plus/minus grading system can be used only for graduate students enrolled in courses available for Graduate School credit.

Grade	Quality Points
A+	4.0
A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
C-	1.7
D+	1.3
D	1.0
D-	0.7
F	0.0

C Grades
The student's academic department may approve six hours of coursework in which a grade of "C+, C, or C-" was received to count toward the completion of degree requirements. Approval of the Graduate Dean must be secured in order to count additional hours with any grade of C in any course required in the degree program.

In no case may more than nine hours of "C" be used to fulfill graduate degree requirements. Some programs may not permit any courses in which a grade of C+, C, or C- has been earned to be used in fulfillment of degree requirements. Although grades below C- will be calculated in the graduate student's grade point average, courses in which these grades have been earned will not be counted towards the fulfillment of degree requirements.

Other Grades
"W" means Withdrew and carries no quality points. No student may withdraw from any course after mid-semester. In exceptional cases, the dean may grant a student's request to withdraw from courses because of illness or conditions beyond the student's control.
"I" means Work in Course Incomplete. If the work is not completed by the end of the next term, regardless of whether the student is enrolled, the "I" automatically becomes an "F".
"X" means course work has not been finished because of the nature of the research or study involved, e.g., thesis work.

Pass/Fail Grading Option
Each department has the discretion of extending a Pass/Fail option to any or all of its graduate students and graduate courses.

Because the advisability of such an arrangement varies from department to department, each department, subject to approval of the Graduate Council, works out the arrangement that is most suitable. The student is referred to his/her departmental chair for details.

When using the Pass/Fail option for graduate students enrolled in graduate courses, A+ through C- will be passing grades and D+ through F will be failing grades.

Changes of Grades
No grade changes can be made without a request and explanation on the part of the faculty member giving the grade and the approval of the Dean of the Graduate School.

Missing Grades
All missing grades will be changed to failing grades one year after the completion of the semester in which the course was taken.

Repetition of Courses
A student who has received the grade of "C" (in a course that is a degree requirement), "D" or "F" may repeat that course upon the approval of the graduate program advisor and the graduate dean. When a student repeats a course, the grade point average will be calculated on the basis of the last grade earned, although all previous grades will remain on the transcript.

Graduate Student Honors

Graduate Dean's Citation
Graduate Dean's Citations are awarded annually to students recommended by their departments in recognition of superior accomplishment in their graduate studies. Each school or college may recommend up to 10 percent of its graduate students completing their degrees in August, December, and May of the academic year. Recommendations are to be based on criteria established by the school or college, which must include above-average academic accomplishment and (if appropriate to the discipline) written or creative evidence of superior accomplishment.

Guy Stephenson Award
The Guy Stephenson Award for Excellence in Graduate Studies honors a former dean of the Graduate School. It is awarded annually to a graduating doctoral candidate.

John Richard Binford Memorial Award
The John Richard Binford Memorial Award honors a former chairman of the Department of Psychology. It is awarded annually to a graduating doctoral candidate.

John M. Houchens Prize
The John M. Houchens Prize honors a former Registrar of the University. In the spring of each year, the Graduate Council evaluates doctoral dissertations submitted for its consideration. If one is considered to be of special merit, the council may recommend that its author be awarded the Houchens Prize.

Nominations for the Stephenson and Binford awards are submitted to the dean in the spring of each year by the chairpersons of doctoral-granting departments. Those individuals nominated must have received their degrees in the previous August or December semesters or the current spring semester.

Dissertations to be considered for the Houchens Prize are submitted by the same route. Dissertations nominated for the Houchens Prize must be written by graduates from the previous May, August, or December semesters.

Requirements for Graduate Degrees

The departmental announcements in this catalog should be consulted in all instances; however, the following rules apply to all master's degree programs.

Course Credit
A minimum total of 30 semester hours of graduate credit is required for the master's degree. At least 15 semester hours must be in courses of the major subject area, and the remaining hours in the program distributed as recommended and approved by the major department. At least one-half of the credits counted toward the degree (exclusive of thesis, practicum and internships) must be in courses open to graduate students only (600 level or above). A grade average of 3.0 or better must be maintained.

There is a time limit imposed, stipulating that credit earned more than six years prior to the completion of the degree may not be counted toward meeting its requirements. This time period may be extended upon recommendation of the student's department head and the approval of the graduate dean.

Maintaining Candidacy
Refer to previous section entitled, General Academic Policies and Requirements, see subsection entitled Maintaining Candidacy.

Thesis
Students completing degree programs that include a thesis must submit the thesis to their major professor at least thirty days in advance of graduation.

Acceptance of the thesis shall be at the discretion of a special reading committee composed of the major professor and two other persons of professorial rank recommended by the department and appointed by the Dean of the Graduate School. One person so appointed shall be from a different department, and all three must be members of the graduate faculty. The committee shall complete its review of the thesis at least one week prior to the final oral examination.

One unbound copy of the accepted thesis, signed by the committee members, must be deposited with the Office of the Graduate School (see Schedule of Courses for due date). Graduate students completing a thesis in an M.S. program offered through the Speed Scientific School are required to submit additional copies. Students should contact the office of the dean of that school for specific information.

The thesis normally carries 6 semester hours of graduate credit, which is in addition to the 15-hour minimum taken within the major department. In certain departments, a professional paper may be required in lieu of a thesis. For procedure in these instances, consult the head of the department.

Final Oral Examination
The final oral examination shall be conducted by a committee of Graduate Faculty members recommended by the head of the major department and appointed by the Dean of the Graduate School in the same manner as the thesis reading committee (see above).

The examination must cover the materials presented in the thesis or professional paper and may include the content of courses taken or other matters pertinent to the candidate's admissibility to the master's degree. At the discretion of the major department, a portion of this examination may be written. The recommendation for the degree shall be determined by a simple majority of the committee members. Recommendation shall be made to the graduate dean at least one week prior to graduation.

In the event of an unfavorable vote, the committee may refuse the candidate's admissibility to the master's degree, or it may recommend another examination with or without additional work.

Programs in Education

Teacher Certification
Students interested in teacher certification for early elementary education (grades P-5), middle grades (grades 5-9), secondary education (grades 8-12), physical education (grades P-12), art education (grades (P-12), or music education (grades P-12) first complete an undergraduate degree in the College of Arts and Sciences, School of Education, School of Music, or College of Business and Public Administration and a designated pre-teacher education core of courses in the School of Education. Students then apply to the Master of Arts in Teaching (MAT) degree program which is completed during a professional year at the graduate level.

Successful completion of the graduate professional year culminates in the granting of teacher certification and the Master of Arts in Teaching (MAT) degree. Certification in special education requires additional graduate level specialized coursework and fieldwork.

Additional information regarding admission to the graduate school and the teacher education program, including application deadlines, is available from the School of Education Advising Center.

Certification programs for school principalship (grades P-12), school superintendent, and supervision are offered through the Department of Administration and Higher Education. These programs require from 45 to 60 graduate hours. Although these courses do not constitute a degree program, they may be incorporated as part of the Ed.S. or Ed.D. program requirements if the candidate is admitted to such a program.

Requirements for Master's Programs in Education
The School of Education offers, through the Graduate School, the degrees of Master of Education, Master of Arts in Higher Education, Master of Science in Exercise Physiology, and Master of Arts in Teaching.

Students desiring to acquire a teacher's certificate through the M.A.T. program should consult the Education Advising Center in the School of Education for information about additional requirements beyond those for admission to Graduate School.

Most experienced teachers and other school professionals pursue the Master of Education degree. The Master of Education degree programs offered by the School of Education are described in this Graduate School catalog. The Master of Arts degree is designed for candidates who wish to do thesis research. Master of Arts programs in education and higher education are offered through the School of Education. Some teachers enroll in master's degrees in their teaching disciplines.

In addition to the basic core in education, students are urged to take course work on the master's level outside the field of professional education. The programs for various school positions vary in terms of professional courses required.

The course EDFD 600, Introduction to Research Methods and Statistics, must be taken as one of the first three courses in many School of Education programs leading to the master's degree. Students should consult degree program requirements.

Each graduate degree program requires an appropriate exit evaluation, e.g., a practicum, comprehensive examination, or a professional portfolio. See the individual program descriptions for specific information.

Admissions
Candidates entering most masters' programs in education, which prepare the student for leadership and specialized roles in education, typically have completed a teacher certification program. Candidates without this preparation but otherwise qualified may enter graduate programs but must complete basic teacher certification requirements, in addition to or within graduate programs, in order to receive the master's degree. Exceptions to this requirement are made for graduate programs in counseling and personnel services, higher education, exercise physiology, and the interdisciplinary early childhood/special education program.

All candidates must meet the general requirements for admission to the Graduate School, as well as the requirements for admission to certain specific programs offered by the School of Education.

All students applying for a master's program must take the GRE either prior to application to the Graduate School or during the first semester of coursework in the Graduate School. A combined score of 800 or above on the Verbal and Quantitative sections of the GRE is expected for all programs in the School of Education except the Master of Science in Exercise Physiology, in which a combined score of 900 or above on the Verbal and Quantitative sections of the GRE is expected. Applicants for admission to the exercise physiology program who do not meet this expectation should contact the Department of Health Promotion, Physical Education, and Sport Studies for assistance.

The School of Education's policy allows a student to complete only one semester of coursework before GRE scores have to be submitted, as the student may not meet the School of Education requirements for admission if GRE scores are below 800. A student with a combined GRE score of 800 or above and an undergraduate grade point average of 2.75 or above will be unconditionally accepted. Students whose GRE scores or undergraduate grade point average falls below these minimum standards should consult the School of Education about alternative criteria for conditional admission. No student with an undergraduate grade point average below 2.25 will be admitted.

Admission to the Master of Arts in Teaching involves additional teacher certification requirements beyond those for Graduate School admission. Contact the Education Advising Center for specifics.

Students who do not wish to obtain an advanced degree or who may not meet the requirements for admission to a degree program in the Graduate School may take advanced course work in the School of Education in a nondegree status if they meet the appropriate admission standards. Various certification programs may be completed in nondegree status or as part of Rank II or Rank I programs.

Applicants who wish information or assistance in selecting an appropriate program should contact the School of Education Advising Center, or the appropriate department chair within the School of Education. After admission, the student will be assigned a permanent faculty advisor to assist in planning a graduate program appropriate to the student's needs and goals.

Rank II Equivalency and Rank I Programs

Thirty-two hours of work in a planned Rank II Equivalency Program may lead to Rank II salary status and certification renewal for Kentucky educators. A grade point average of 2.5 is required on the course hours submitted for the Rank II Equivalency program. A planned Rank I Program may be pursued by those who have completed a master's degree or the nondegree Rank II Equivalency Program.

Calculation of the grade point average for Rank I programs will include only those courses completed after the Master's degree is awarded or the Rank II Equivalency program is completed. A grade point average of 3.0 is required on the course hours submitted for Rank I. No credit will be accepted for courses carrying a grade lower than C.

Both programs must meet state guidelines. Additional information concerning the Rank II and Rank I programs is available in the School of Education Advising Center, or from appropriate faculty advisors in the School of Education.

The Master of Arts in Teaching Program

Based on a conceptual framework, "teachers as learners and leaders," the teacher preparation programs share a common goal of developing reflective educators who view learning as a constructive and life-long experience. Teacher education programs at the University of Louisville prepare teachers as life-long learners who can lead students to success.

The teacher preparation programs emphasize a depth of academic preparation that allows teachers to be knowledgeable about the subjects they teach and to develop the critical thinking and life-long learning skills increasingly important for teachers.

Second, the Pre-Teacher Education Core (Early Elementary and Middle Grades) and the Exploring Teaching Class (Secondary Education, Art, Music, and Physical Education) allow any UofL undergraduate or post-baccalaureate student to explore the profession of teaching from the viewpoint of children and their families, the sociocultural context of modern schooling, and the nature of restructured schools under KERA. Students can then make an informed decision about applying for the professional year program leading to a Master of Arts in Teaching (MAT) degree.

Third, the teacher preparation program emphasizes:

- responding constructively to socio-cultural differences among students
- collaborative leadership to improve schools and young people's lives
- nurturing students as active agents in their own learning
- meeting needs of students with disabilities and gifts
- application of appropriate technologies
- designing and implementing engaging school curricula to support KERA
- advocating for student opportunities in school and community

Fourth, these programs are delivered in concert with practitioners in the schools and community agencies. Courses and experiences with students occur at the schools; teachers, staff, and students participate actively in them; and faculty, staff, and students, in turn, are involved with restructuring initiatives at these schools.

The Master of Arts in Teaching degree is an intensive program that culminates in both the graduate degree and Kentucky teacher certification. It builds upon an undergraduate degree in an academic discipline that includes academic coursework in fields taught in Kentucky schools and an undergraduate pre-teacher education core of courses. Teacher preparation is offered in early elementary school education (grades P-5), middle school education (grades 5-9), high school education (grades 8-12), music education (grades P-12), art education (grades P-12), and physical education (grades P-12).

University of Louisville undergraduates who are interested in a teaching career should complete a four-year bachelor's degree in either the College of Arts and Sciences, the College of Business and Public Administration, the School of Music, or the Department of Health Promotion, Physical Education and Sport Studies. They should begin preparing for application to the Teacher Education Programs by taking the prerequisite core course(s) in understanding children and families, their sociocultural background, and the structure and function of schools.

Applicants should be prepared to make an intensive commitment for approximately one year and should be able to devote full time to the program. The preparation program is delivered primarily in school settings and involves the students and teachers in those sites.

Applicants must provide a portfolio composed of evidence of academic and personal preparedness to pursue the master's degree and teacher certification. Students must have earned a bachelor's degree, with a minimum grade point average of 2.75 or higher, and are expected to have a combined score of 800 on the verbal and quantitative sections of the General Test of the Graduate Record Examination. They must also submit letters of recommendation from faculty familiar with their academic record, complete the pre-teacher core, be interviewed, have the necessary academic coursework in an area of teaching, and submit evidence about their literacy, academic background, computer skills, physical condition, and reasons for pursuing a career in teaching. A faculty screening committee considers all the information before making an admission recommendation. For specific information, contact the Education Advising Center (852-5597).

Statement on Student Teaching/Field Experiences

Placement in field experiences is contingent upon the applicant's prospects for success and upon the availability of a qualified supervisor. The faculty reserves the right to evaluate the qualifications and suitability of student applicants and the quality of the student's performance and to make placements and appropriate changes based on the recommendation of the university coordinator and/or the host school or other agency. Evaluation will be based on standards of conduct and performance established by the faculty. Student teachers must abide by all policies, rules, and regulations of the University and the assigned school or other agency. Failure to abide by this policy may result in dismissal from the program.

Specialist in Education Degree

The Specialist in Education (Ed.S.), a 6th year degree program (30-hours beyond the master's degree), is offered with majors in various areas of professional education. Selective admission standards restrict this program to the superior graduate student in education.

Admission requirements for the Ed.S. include an appropriate master's degree; a grade point standing of at least 3.3; a combined score of 900 on the Verbal and Quantitative portions of the Graduate Record Examination; admission to the Graduate School; successful, relevant professional experience; a written rationale for pursuing the degree; a successful interview with a Departmental Committee; and any other evidence the applicant wishes to submit that addresses his/her academic and professional strengths.

Complete applications for admission must be submitted by March 15th or October 15th. A Departmental Committee of at least three faculty members will consider the applications and make recommendations about admissions to the Associate Dean by the end of the semester. Potential applicants should confer with the departmental chairperson before filing an application.

There is a time limit imposed stipulating that credit earned more than six years prior to the completion of the degree may not be counted toward meeting its requirements. This time period may be extended upon recommendation of the student's department head and the approval of the graduate dean.

Requirements for the Degree of Doctor of Education

The Doctor of Education (Ed.D.) program is designed to permit the student to choose a subspeciality in one of five curricular areas: evaluation, educational administration, special education, counseling and student personnel, or supervision. The curriculum includes four components of course work and independent-study activities:

(1) urban studies component,
(2) professional subspecialty component,
(3) elective component, and
(4) knowledge development and utilization component.

Students enrolling in the Ed.D. program will have established an area of subspeciality through previous study and experience, and will focus subsequent work upon developing that subspecialty and integrating it with an understanding of urban concerns. Each student's program will be planned in relation to his/her academic background, professional goals, and program requirements.

The Ed.D. requires a minimum of 90 semester hours beyond the baccalaureate degree. At least 45 of the 90 hours must be earned at UofL. These 45 hours will include the 18 hours fulfilling residency and the 12 hours required for dissertation credit. Not more than 15 hours of UofL coursework taken in nondegree status may be applied to the 90 hours. Students are also subject to the general regulations of the Graduate School. The program in counseling psychology requires a minimum of 48 hours in the counseling psychology concentration.

Applications to the doctoral program in Counseling Psychology will be reviewed by an admissions committee composed of five (5) members including all faculty members of the Counseling Psychology Program. The admissions committee will be chaired by the Training Director for the Educational and Counseling Psychology Department. Recommendations for admission are forwarded to the Dean of the School of Education who, in turn, forwards the recommendation to the Graduate School for consideration. All students granted admission to the Counseling Psychology Program will receive a letter from the committee after the letter of acceptance from the Graduate School is sent. Students will be asked to accept their offer of admission within four weeks. After that time, vacancies will be offered to applicants from the alternate list.

Prior to acceptance, all previous graduate course work taken by the doctoral candidate will be evaluated for possible inclusion in the Ed.D. course of study. With the approval of the student's advisory committee, credits earned at other institutions may be transferred toward the Ed.D. at the University of Louisville in accordance with Graduate School policies. Although not considered transferable, credit earned in programs (M.A., M.Ed., M.S., Certification, Rank I, Rank II, etc.) at other institutions may be counted towards fulfilling the minimum number of post baccalaureate hours required for the Ed.D.

Curriculum
Recipients of the Doctor of Education degree will complete a minimum of 90 semester hours of study beyond the baccalaureate degree. It is anticipated that persons who enter the program will have completed the master's degree and perhaps some additional course work at the time of application.

Residency
Students are required to be in residence for 18 semester hours within a 12-month period.

Transfer of Credit
With the approval of the student's advisory committee, transfer credit earned at other institutions may be applied, in accordance with general policies, toward the Ed.D. Although not considered transferable credit, credit earned in planned graduate programs (M.A., M.Ed., M.S., Certification, Rank I, Rank II, etc.) at other institutions may be counted toward fulfilling the minimum number of postbaccalaureate hours required. Each student in the Ed.D. program must earn at least 45 hours of postbaccalaureate credit at the University of Louisville. Included in these 45 hours must be at least those hours fulfilling residency and a minimum of 12 hours of dissertation credit.

Examinations
Upon completing the course work in the planned program, each student will be required to pass a written candidacy examination. Upon completion of the dissertation, each student will be required to pass a final oral examination, as set forth in the requirements of the Graduate School.

Dissertation
A dissertation is required of all candidates for the degree of Doctor of Education. It is to be a scholarly achievement in basic or applied research in education and must demonstrate a thorough understanding of research techniques in education and the ability to conduct independent research.

Upon successful completion of the comprehensive examination, the student's Program Advisory Committee will automatically dissolve. The student must then consult with the Dean of the School of Education about the appointment of a dissertation advisor and other Dissertation Committee members. The role of this committee is to approve a proposal, assist the student in the execution of the study, and guide the development of the dissertation document.

The student should meet with the dissertation advisor before finalizing the membership of the committee. The committee will consist of at least three members of the Graduate Faculty, including the advisor, a maximum of two of which may be from the same department.

Members of the committee should have an interest in the potential dissertation topic and/or the ability to contribute to the proposal design and study implementation. Therefore, some may be from outside the School of Education. However, all members must be approved by the Dean of the Graduate School.

Final Oral Examination
The oral examination is a defense of the dissertation and a demonstration of the candidate's mastery of his/her field. The examination will be conducted by a committee of at least five persons comprising the candidate's dissertation committee and additional members of the Graduate Faculty appointed, as necessary, by the Dean of the Graduate School upon recommendation of the Dean of the School of Education. The candidate's major professor shall chair the examination committee.

The examination must be taken at least fourteen days before the end of the semester in which the degree is awarded. To be passed in this examination, the candidate must not receive more than one abstention or dissenting vote.

Time Limitations
The candidate must complete all other requirements for the degree of Doctor of Education within four calendar years after passing the comprehensive examination and being admitted to candidacy. A doctoral degree student must have been admitted to candidacy not later than the end of the ninth month prior to the awarding of the degree, that is:

August graduation:	November 30 of preceding year
December graduation:	March 31 of same year
May graduation:	August 31 of preceding year

Although the prescribed course work may have been completed, the candidate must maintain his/her candidacy until the degree is awarded (see previous section entitled General Academic Policies and Requirements, subsection entitled *Maintaining Candidacy.)*

Summary
The minimum total graduate hours required for the Doctor of Education degree is 90. These hours shall be distributed among four program component areas as follows:

Component Areas	Semester Hours
Urban Studies	15
Professional Subspecialty	30
Knowledge Development and Utilization	Minimum of 24
Electives	Hours to complete the 90-hour requirement

A student must also meet program residency and examination requirements. Students are also subject to the general regulations of the Graduate School and to the regulations specified for a particular component and may be required to take more than the minimum of 90 hours required for the degree. Each student must also meet program residency and examination requirements. Students are also subject to the general regulations of the Graduate School.

Admissions
Each applicant for admission to the doctoral program must:

1. meet the general requirements as listed in the current catalog for admission to the Graduate School of the University of Louisville and apply for admission to the Graduate School;
2. possess a master's degree or the equivalent which provides the necessary background for a program subspecialty;
3. have a grade-point standing of 3.50 (based on a 4-point scale) in previous graduate study and have a combined score of 1,000 or above on the verbal and quantitative aptitude portions of the Graduate Record Examination. While the preferred test is the GRE, the Miller Analogies Test is an acceptable alternative. A score of 54 or above is required. Exceptions may be made in the case of applicants who possess other outstanding qualifications. Consideration will be given to outstanding professional achievements, scholarly productivity, creative activities, and other factors that suggest potential special contributions of candidates;
4. provide recommendations from three persons familiar with the applicant as a graduate student and/or as a professional in education or other human-services employment;
5. fill out the Application for Ed.D. Program (available from the School of Education) and submit a formal statement that sets forth a rationale for seeking doctoral study, professional experiences, professional goals, and evidence of commitment to urban education. Application materials are available in the School of Education Dean's Office
6. submit a professional portfolio [program in educational administration (EDAD) only].
7. for all programs in counseling and student personnel work, the student should exhibit those personal qualities and characteristics which, in the judgment of the faculty, are necessary for effective functioning in the role of a counselor or student personnel worker. The faculty may require interviews in addition to written credentials as part of the admission process.

   At any point after admission, the faculty reserves the right to review a student's fitness, on the basis of personal characteristics, for continuing in the counseling and student personnel program. Such an assessment shall be initiated upon the recommendation of two faculty members and shall consist of a review of the student's academic record, other pertinent evidence, and an interview with the student by the department faculty. This review must result in a recommendation to the Dean for (1) continuation of a student in the program, (2) continuation for a specified professional period with specific conditions for continuation thereafter, or (3) dismissal from the program. Some courses may require learning experiences which focus on self-understanding or growth.

   Doctoral students in the Educational and Counseling Psychology Department are reviewed yearly to determine progress in their program of study and general fitness to continue in the program.

Applicants may supplement their application with evidence of their professional and scholarly work. After initial screening of applications, doctoral screening committees invite selected candidates for interviews. Additional information may be requested to document preparedness for doctoral studies.

For application forms and further information call or write: Dean's Office, School of Education, University of Louisville, Louisville, Kentucky 40292; (502) 852-5597.

Doctor of Education Degree (Ed.D)

Urban Studies Component (15 hours)

Professional Subspecialty Component (Minimum of 30 hours)
Each student will have a subspecialty in educational administration, special education, evaluation, counseling and student personnel, or supervision.

The particular concentration of course work in any student's subspecialty will vary somewhat according to that student's background and interests. However, all candidates in each of the five subspecialty areas will take a doctoral-level seminar in their respective area (3 semester hours) and a supervised internship in an urban setting (3 semester hours). The former will address current practice and related research in the area. The latter should be different from the student's present position and should be related to the student's doctoral goals and coursework.

Knowledge Development and Utilization Component (Minimum of 24 hours)
Each candidate for the Ed.D. will carry out a substantial, creative project of scholarly quality. In developing dissertation projects, candidates will be required to select topics which enable them to demonstrate their ability to conduct inquiry related to educational processes and problems of elementary and secondary school systems or nonschool organizations in urban settings. The knowledge development and utilization component will include three subparts:

Development of Research Competencies (9 hours)
Each candidate will be expected to possess a basic understanding of research design and methodology and to demonstrate competence in the critical analysis of research. Candidates in the counseling psychology concentration are required to be competent in multivariate methods of analysis. In addition, they are required to be competent in experimental and quasiexperimental research design.

Dissertation Seminar, EDUC 790 (3 hours)
Consultation and discussion with faculty and students to formulate doctoral project proposals, explore alternative research designs and field study approaches, and present results for criticism.

Dissertation Research, EDUC 795 (12-15 hours)
Independent study arranged with the candidate's advisor or research supervisor.

Elective Component (Hours to complete the 90-hour requirement)
This component provides considerable flexibility for each student in planning a program. Courses taken during previous graduate studies may be applied in this area. These electives also may be applied to further study in a subspecialty area. For those whose interests and research plans encompass two or more areas within professional education, or perhaps a content area in the academic disciplines, this portion of the program may be addressed to building or strengthening that cognate area. These hours also may be focused on further concentration in urban studies.

Requirements for the Degree of Doctor of Philosophy

In addition to the particular rules of the various departments as stated in their sections of this catalog, the following general rules apply to all Doctor of Philosophy programs.

Application for the Doctorate
To become an applicant for the doctorate, the student must be admitted to the Graduate School (see previous sections on Admission to the Graduate School and Admission Statuses) and be accepted by the department of specialization. Only students with exceptional scholarship and originality are accepted for work towards the degree of Doctor of Philosophy, and departments are expected to have more restrictive criteria for admission to this program than those for admission to a master's degree program.

The degree is not awarded solely upon completion of a curriculum of prescribed courses, even though the student has done superior work in them; rather, it is awarded in recognition of creative scholarship as demonstrated by a substantial contribution in the candidate's chosen field. Only students who offer promise of meeting this high standard will be accepted by a department to begin work toward this degree. The prospective student should consult in person with the department in which he/she wishes to major.

Program of Study
Each applicant for the doctorate is expected to take such courses as may be required for the advancement of scholarship in general and for training in his/her field of specialization. The major professor shall design a program of study to fit the needs of the individual student subject to approval by the department's graduate program committee and/or department chair. This program may be modified at any time upon the recommendation of the major professor and approval of the department head and the graduate dean. The program will consist of a major field and such minor fields as the major professor and the department head may agree upon.

All courses offered by the University, at any level and in any school, shall be accessible to the doctoral student, subject to approval by the instructors. The student is expected to receive high marks in these courses; grades lower than "B" will usually be regarded as evidence of poor scholarship and may bar the student from admission to candidacy.

Residency
In order that the student may be assured of an opportunity to utilize the educational facilities properly and to participate in the intellectual life and research atmosphere of the University, at least two years of study must be spent at the University of Louisville and at least one must be spent in full-time residency.

To be considered in full-time residency for one year, a student must be registered for 9 or more hours in each of two consecutive semesters.

Foreign Language Requirement
Foreign language proficiency is no longer a general requirement of the Graduate School. However, some departments have established such requirements, which will be specified in their sections of this catalog.

When a proficiency in computer language is expected and no provision has been made by the major department, a graduate student must establish his or her proficiency in computer language by successful completion of ESC 102, FORTRAN, offered by the Speed Scientific School, or by passing an equivalent examination administered by the Speed School.

Qualifying Examination and Candidacy
The applicant for a Doctor of Philosophy degree must pass a qualifying examination, oral or written, or both. Its purpose is to verify that the student has sufficient understanding of and competence in his/her field to become a candidate for the degree. This examination may be referred to as the preliminary, comprehensive, or candidacy examination.

To be eligible for this examination, the student must have satisfactorily completed the major portion of the prescribed course work and must have met the foreign language requirement, according to departmental policy. It is the student's responsibility to be aware of departmental policy on the consequences of failure of all or part of the examination. A student who fails the examination will not be allowed to retake it more than once.

A doctoral degree student must have been admitted to candidacy not later than the end of the ninth month prior to the awarding of the degree, that is:

August graduation:
November 30 of preceding year

December graduation:
March 31 of same year

May graduation:
August 31 of preceding year

Although the prescribed course work may have been completed, the candidate must maintain an active registration status until the degree is awarded (see previous section on General Academic Policies and Requirements, subsection *Maintaining Candidacy).*

Time Limitation
The candidate must complete all other requirements for the degree of Doctor of Philosophy within four calendar years after passing the qualifying examination. In exceptional cases, the Dean of the Graduate School is empowered to grant limited extensions of this four-year period.

Dissertation
A dissertation is required of all candidates for the degree of Doctor of Philosophy. It is to be a scholarly achievement in research, and should demonstrate a thorough understanding of research techniques in the field of inquiry and the ability to conduct independent research.

The dissertation is to be submitted in completed form to the head of the major department at least thirty days before the end of the term in which the candidate expects to be graduated, and the candidate is not eligible for final examination until the dissertation has been approved.

The dissertation shall be read by a reading committee, chaired by the major professor, and appointed by the Dean of the Graduate School upon the advice of the head of the major department. This committee shall consist of not fewer than three members of the Graduate Faculty and must include one representative of an allied department. The dissertation must be approved by the committee and the head of the major department.

One unbound copy of the dissertation, signed by the dissertation committee, must be deposited with the Office of the Graduate School before graduation. Graduate students completing a dissertation in a Ph.D. program offered through the Speed Scientific School are required to submit additional copies. Students should contact the office of the dean of that school for specific information.

Final Oral Examination
This examination is to be a defense of the dissertation and a demonstration of the candidate's mastery of his/her field. The examination will be given by a committee of Graduate Faculty members appointed by the Dean of the Graduate School upon recommendation of the head of the major department. The Committee will consist of five or more members representing the major department and at least one allied department. The major professor shall be chair.

The Graduate Dean's Office shall notify all members of the Graduate Faculty at least one week in advance that they are invited to participate in the examination, but only members of the committee may vote. At the discretion of the major department, a portion of the examination may be written.

The examination must be taken at least fourteen days before the end of the semester in which the degree is to be granted. To be passed in this examination, the student may not receive more than one abstention or dissenting vote.

Special Facilities and Programs

University Libraries

The University offers an innovative and extensive library system designed to support graduate research in a variety of fields. The University Libraries consist of the Ekstrom Library, and five libraries serving the students and faculty in the areas of Art, Music, Law, Health Sciences, Engineering, Physical Sciences and Technology, and the University Archives and Records Center. Total University of Louisville Library holdings number approximately 1,431,279 volumes.

The libraries subscribe to 13,333 journals and to over 200 electronic journal citation databases, with electronic access to more than 12,000 journals. In addition, the libraries hold over 1.5 million items in microform.

The University Libraries provide access to electronic resources and databases covering a wide spectrum of subjects for faculty, staff and both undergraduate and graduate students. The Interlibrary Loan units of the Ekstrom and Health Sciences libraries provide access to the collections of the Kentuckiana Metroversity member schools, the Louisville Free Public Library, and other libraries throughout the state and nation for materials not owned by the University Libraries. The U of L libraries' collections are accessible through an new state-of-the-art online catalog, Minerva 2000.

Ekstrom Library
The William F. Ekstrom Library on Belknap Campus contains over 600,000 books and subscribes to 4,200 journals as well as an array of diverse information services and collections. Ekstrom is the largest library facility at the University and houses over half of the entire University Libraries' collections. The library is a depository for United States government publications and receives approximately 70% of titles available from the Government Printing Office. This department also has selected reports of the several divisions of the United Nations, as well as selected Kentucky state publications. A superb collection of videos relating to race, gender and diversity can be found in the Media Collection on the second floor of the library. The library houses a Collaborative Learning Center with a fully networked computer classroom with 25 workstations plus a computer laboratory with an additional 31-workstations . More information about the Ekstrom Library can be found on the World Wide Web at: http://www.louisville.edu/library/ekstrom.

Special Collections
The Photographic Archives, established in 1967 is located in the Ekstrom Library. It contains approximately 1.2 million images, plus manuscripts and other items related to its collection specialties. Their holdings contain research level documentary collections covering a broad range of topics. In addition, collections of fine prints support the University's academic major in photography.

Nationally significant collections include the manuscripts and photographs in the Roy Stryker Papers Collection. The Archives is the central depository for materials relating to Stryker, who directed massive documentation projects for the Farm Security Administration, Standard Oil (New Jersey), and Jones and Laughlin Steel. These materials document U.S. life from 1935 through the 1950's.

A significant number of collections in the Photographic Archives are of local and regional interest: the Brown-Doherty Collection is a photographic record of Louisville Architecture; the Caufield & Shook Collection depicts life and times in Louisville and Southern Indiana, 1903-1975; the Metropolitan Sewer District Collection documents twentieth-century development of Louisville and its infrastructure; the Richard Gilbert Potter Collection is the result of a forty-year effort to preserve photographs of people, places and events in Louisville; the Colonel John Macauley Theater Collection contains hundreds of portraits of nineteenth-century theatrical personalities. The Jean Thomas Collection and others document life and folkways in eastern and rural Kentucky.

The Photographic Archives is open weekdays. It has indexes to most major collections, has a reference staff, and operates a gallery with a continuing series of exhibitions from the collections. More information can be found at http://www.louisville.edu/library/ekstrom/special/pa

The Department of Rare Books and Special Collections in Ekstrom Library houses primary research materials in areas of literature and history. Literary manuscripts, early printed books, first editions, illustrated books, as well as reference materials on book arts and paper conservation are available for use.

Chief among the many special collections are the Bullitt Collection of rare mathematics and astronomy books, the McWhorter Collection of Edgar Rice Burroughs (the largest institutional collection in the world of these materials), and the Kain Collection of the Irish Literary Renaissance. Other comprehensive collections focus on Graham Greene, H. L. Mencken, World War I, and the history of theater and film. A regular exhibition schedule draws special attention to these and other collections.

University Archives and Records Center
The University Archives is a research repository of national significance. It contains primary sources relating to the university, Louisville, and the nation. It attracts students, faculty, and scholars from Louisville, from elsewhere in the U.S., and from other countries. It collects, preserves, and makes available for research, historical manuscripts, oral history interviews, and other primary research materials, and thus serves as a research laboratory for humanists, social scientists and others. Its Urban History Collections include nineteenth and twentieth century records of area businesses, cultural organizations, social service agencies, and churches; and personal papers of politicians, scholars, members of the Jewish and African-American communities, women, and other prominent and representative Louisvillians. Students with class projects, theses, or dissertations on University, local or regional topics are invited to consult this office.

The University Archives also serves as the official repository for the records of the University of Louisville, one of the oldest metropolitan universities in the United States. University records preserved in the Archives include minutes of trustee, faculty, staff, student, and committee meetings; official, student, and faculty publications, such as catalogs, yearbooks, newspapers, books, and articles; records of student organizations and classes; samples of student notes, faculty lectures, and examinations; theses and dissertations; departmental and administrative office files; correspondence files; photographs of University people and places; maps; films, television tapes, and other audiovisual items. More information about the University Archives can be found on the World Wide Web at: http://www.louisville.edu/library/uarc/

Fine Arts Library
The Margaret M. Bridwell Art Library, located on the main floor of Schneider Hall, contains over 70,000 volumes, most of which can be accessed by Minerva 2000, the University Libraries' online catalog. The collection supports the programs of the Fine Arts Department, covering the areas of painting, drawing, sculpture, printmaking, architectural history, interior design, graphic design, art education, pottery, textiles and decorative arts. In addition to books and journals, the library collects videotapes and CDROMs.

The library subscribes to more than 300 journals and museum bulletins which can be accessed by a number of indexes and abstracts in either electronic or print form. Art Library materials circulate to all faculty and to graduate students in the Fine Arts Department.

More information about the Art Library can be found on the World Wide Web at: http://www.louisville.edu/library/art

Dwight Anderson Music Library
The Dwight Anderson Memorial Music Library houses one of the largest academic music collections in the State of Kentucky. Since its founding in 1947, the principal mission of the library has been to provide materials in support of the curriculum of the School of Music and the research of its faculty.

Total holdings exceed 77,000 volumes, and subscriptions are maintained for nearly two hundred fifty magazines and journals. The Listening Area offers state-of-the-art audio and video equipment, complete with compact disc players, cassette decks, and videocassette players. The sound recording collection now exceeds 16,000 discs.

The library houses several special collections of local and national interest. Of particular importance are: The Traipsin' Woman (Jean Thomas) Collection, the Isidore Philipp Archive and Memorial Library, and the Hattie Bishop Speed Collection. The collection of sheet music, with its emphasis on Louisville imprints, is the most extensive in the region. The most notable recent acquisition is a collection of over four hundred eighteenth and early nineteenth century prints and manuscripts assembled by the noble Ricasoli family of Tuscany. The library also serves as the repository for materials related to the Grawemeyer Award for Music Composition. More information can be found at http://www.louisville.edu/library/music/

Laura Kersey Library of Engineering, Physical Science and Technology

The 120,772 volume Kersey Library collection supports research in the fields of chemical, civil, electrical, industrial, and mechanical engineering; computer science; mathematics; chemistry; physics; engineering management; operations research; and energy. The Kersey Library subscribes to over 1,297 periodicals and holds theses, the result from research conducted by students in the physical science and engineering departments. The reference collection contains basic and research materials. CD-ROM and web databases available at the Kersey Library are COMPENDEX (Engineering Index), MATHSCI (Mathematical Reviews), INSPEC (Electrical and Electronic Abstracts, Computer and Control Abstracts and Physics Abstracts combined), Beilsteiníss Current Facts in Chemistry and Web of Science. On-line searching and reference assistance are available by appointment. For more information check the World Wide Web page at: http://www.louisville.edu/library/kersey

Kornhauser Library

The Kornhauser Health Sciences Library located in downtown medical center, meets the Information needs of the Schools of Allied Health Sciences, Dentistry, Medicine, Nursing, Public Health and local area health practitioners. Graduate School students make up a significant part of the Kornhauser Library user group.

The library collections contain more than 209,000 volumes and 1779 journal subscriptions. The collections include a large number of multimedia materials and many historical items relating to health care in Kentucky and the Trans-Appalachian West.

Library services include circulation of materials, reference, interlibrary loan, database searching and access to electronic Information resources via the WWW and Internet.

The Library was founded in 1837 as the Library of the Louisville Medical Institute, which in 1846 became the Medical Department of the University of Louisville. Libraries of the Hospital College of Medicine, the Louisville Medical College, and the Jefferson County Medical Society were incorporated in the present collection at different times early in this century. In 1970 the libraries of the School of Dentistry and the School of Medicine were combined and housed in the present building. Nursing and Allied Health Collections have since been added, thus creating a comprehensive health sciences information resources center. Additional information on the Kornhauser library can be found at: http://www.louisville.edu/library/kornhauser

Law Library

The library of the Louis D. Brandeis School of Law contains more than 300,000 volumes and microform volume equivalents, emphasizing primary and secondary resources in United States law. Special collections include the papers and correspondence of U.S. Supreme Court Justices John Marshall Harlan and Louis D. Brandeis. The library is a selective depository for federal government documents, and a hardcopy depository for U.S. Supreme Court records and briefs. For more information on services and the collections check the World Wide Web at: http://www.louisville.edu/library/law.html

Labor-Management Center

The Labor-Management Center is a component of the College of Business & Public Administration. The Center is a resource for the University, labor and management groups, government agencies, and community organizations in both education and research. Philosophically, the Center is committed to a balanced approach to employee-employer relations within the broad concept of urban affairs.

The Center provides non-credit, continuing education courses together with research and testing to develop strategies to improve both present and long term labor-management cooperation. The Center provides faculty for the Labor-Public Management track of the MPA degree. To fulfill its mission, the Center is actively involved in augmenting the University's academic resources in the field as well as continuing to develop and conduct practical programs of education, research, and service in response to the needs of labor, management, and the urban community.

Computing Services

The University of Louisville's Information Technology (IT) division provides computing services through international (e.g. Internet), statewide (e.g. Kecnet and KTLN) and campus networks. Additional information regarding services offered by Information Technology can be found at: http://www.louisville.edu/it

These networks are connected to mainframe, mini, and micro computers. Two large student computing facilities are located on the Belknap Campus and the other is located at the Health Sciences Campus (along with numerous smaller facilites) provide access to the networks and computer resource of the University.

The centralized computing systems managed by Information Technology at U of L consist mainly of IBM and UNIX systems. They are located in the Miller Information Technology Center on Belknap Campus. These systems are used for general-purpose academic work, administrative business applications and library computing services. Statistical analysis and graphic software, statistical instruction software, various mathematical software, document processors, database software, various compilers and interpreters as well as other program development software are all available on these systems. It also includes a wide variety of Internet, e-mail, file transfer and World Wide Web services.

Computer accounts are available to students, faculty and staff. Accounts are to be used for authorized purposes as specified in account agreements and associated policies. Information Technology provides a wide range of other services as well. This division is responsible for the installation and maintenance of the campus-wide data network including the interactive video conferencing network, Kentucky Telelinking Network (KTLN), Internew Access via the Community of Access (COA), along with the current router based backbone network. The campuses are also connected via a Metro FDDI network along with remote access (Dial-In) services. A video broadband communications network and microwave network, a staellite downlink and uplink site tied directly to the Kentucky Educational Television Star Channels System. The University is licensed for ITFS (Instructional Television Fixed Service), and is a member of KET. The Kentucky Educational Communications Network (KECNET), formerly a private network, is now merged with the Kentucky Information Highway (KIH) that links all the universities in the state. Also, all of the University's telecommunications equipment (8,000) phone connectons and more than (9,000) workstations. Information Technology supports all of this with consultation, programming and engineering design services, newsletters, documentation and hands on training courses.

Information Technology's Computing Centers (public computer laboratories) are located in the Miller Information Technology Center (South Center), the College of Business and Public Administration Building (North Center) and Ekstrom library (Ekstrom Lab) on the Belknap Campus, the Instructional Building B (Health Sciences Center) on the Health Sciences Campus, and the Shelby Campus User Center (Burhans Lab). Together, these five centers provide more than 200 work stations for stand alone use or for access to UofL's computing resources. Additional information regarding Information Technolgoy's computing resources can be found at: http://www.louisville.edu/it/dcs and http://www.louisville.edu/it/opcenter.

Instructional Technology/ Instructional Support

The Instructional Technology/ Instructional Support (IT/IS) Department provides instructional technology support services for the University of Louisville. It provides consultation for technology applications for instruction, research and other programs.

Support services are available through IT/IS offices at Belknap and Health Sciences Center campuses and at the University Center for Continuing and Professional Education at Shelby Campus. These services are also provided to the University extended community and other UofL program locations. Contact IT/IS for: classroom support media equipment scheduling and distribution; projection services for conventions and special programs; room scheduling for specified areas; technical assistance and classroom design; Medical and Dental School students microscope rental; teleconference and telecourse coordination; planetarium programs; instructional design consulting; contract programming for instructional applications; technical assistance in instruction, research and service oriented grant applications; Windows based, Macintosh based, and mainframe based software training through short courses; special software tutoring; Web Based instruction; Web page development; and joint training offerings with the University Center for Continuing and Professional Education.

Horner Bird and Wildlife Sanctuary

This 200-acre tract is located upon a dissected plateau in Oldham County, about 25 miles from the Belknap Campus. It is largely covered by second-growth deciduous forest, and it contains streams, steep hillsides, and rolling upland. It serves not only as a wildlife sanctuary but also as a field laboratory for class trips and for research in plant and animal ecology and natural history.

Oak Ridge Associated Universities

Since 1948, students and faculty of the University of Louisville have benefitted from its membership in Oak Ridge Associated Universities (ORAU), a consortium of colleges and universities and a management and operating contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education, the DOER facility that ORAU manages, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the Resource Guide and the Minority Research and Education Programs brochure, which are available by calling the contacts below.

ORAU's office for University, Industry, and Government Alliances (UIGA) seeks opportunities for collaborative research and development alliances among ORAU's members, private industry, and major federal facilities. Current alliances include the Southern Association for High Energy Research, the Bioelectromagnetics Research Consortium, High Performance Computing, Bioprocessing, Pan American Association for Physics, Materials Science Forum, and international initiatives in support of the New Independent States in Central and Eastern Europe. Other UIGA activities include the sponsorship of conferences and workshops, the Visiting Scholars program, and the Junior Faculty Enhancement Awards. A copy of Especially for Members, which details UIGA's programs, in available from the contacts below.

For more information about ORAU and its programs, contact Dr. Thomas R. Hanley, ORAU Council member, at 502-852-6281; or contact Ms. Monnie E. Champion, ORAU Corporate Secretary, at 423-576-3306, or via Internet at champiom@ORAU.Gov.

WHAS Crusade for Children Audiology and Speech Pathology Center

This University speech and hearing center is administered through the Department of Surgery and has the dual purpose of providing community service for people of all ages and graduate training in the discipline dealing with communication disorders.

Urban Studies Institute

The basic objective of the Institute is to develop means by which the University can better serve communities, at all levels, in the search for solutions to the problems of contemporary life. In meeting that objective, the Institute organizes interdisciplinary research teams capable of addressing the complex aspects of community planning, problem solving, and policy development. As a major research component of the University, the Institute regularly carries out applied research for local, regional, and state government agencies, assisting them in the development of policy and program priorities. Although the Institute's activities involve primarily research and public services, its faculty often teach in other colleges and university departments. The Institute serves as a source of information to advanced students in a number of disciplines and as a catalyst for action by individuals and groups.

University Services

International Center

The International Center is the University's focal point for international education. Its mission is to assist all schools and colleges of the University in developing and implementing student and faculty exchanges and programs consistent with the goal of internationalizing U of L. In doing so, it fosters programs to send U of L students abroad and receives students from overseas for study at U of L. It also encourages the development of area studies, conferences, and lectures of international scope while providing general support for students, faculty, and visitors whose concerns are those of international education.

Brodschi Hall houses the main offices providing services to students, faculty and foreign visitors to the University. It also has a reading room for all interested in international education, stocked with a growing collection of international newspapers, magazines, and a large collection of pamphlets and books on opportunities for international study. It houses two main offices whose staff manage the work of facilitating the integration into the U of L community of persons from abroad and the arrangement of programs of Study Abroad for the University's own students. The Office of the International Student Coordinator (OISC) fosters international scholarship, exchange and understanding through its multi-cultural services and programs. The Associate Director of the Center oversees U of L's programs providing opportunities for our students to study abroad in a rich variety of programs and settings. This Office is also responsible for the U of L Work Exchange with our Sister City Montpellier in France, and our social work program in Munich, Germany, which arranges an exchange providing to graduate students experience of the organization and delivery of social services in Germany, while also allowing fifteen German professors of Social Work to come to the University to observe the organization and delivery of social services in Louisville.

CISP also works closely with faculty committees to administer six Exchange Scholarships for study in Finland (Tampere), France (Paul Valery University, Montpellier), Germany (Mainz, at Johannes Gutenberg University), Japan (Kansai Gaidai University), France (University of Paris), and Germany (Wismar, at the Hochschule fuer Technologie). The activities of the Center also embrace more than fifty other exchange programs worldwide, for students and faculty. These focus on fostering international understanding, cultural diversity, and above all else respect for and tolerance of difference within our one human family within the strategic goal of internationalizing U of L.

The Center provides all services of an international nature or referrals on matters of concern to other divisions of the University. Its main phone is (502) 852-6602, Fax (502) 852-7216.

International Student Coordinator

Located in the International Center, the coordinator provides administrative services and counseling to international students and scholars as they adjust to life in a new culture. Services for international students include assistance with legal and immigration documents; orientation programs for new arrivals; help with language difficulties, housing, and financial arrangements. In addition, the office offers programs and activities which encourage interaction among American and foreign students. Currently more than 600 students and scholars from over 70 nations are studying at the University.

Students from foreign countries must meet three criteria before they can be granted admission:

1. They must meet the regular admissions standards as applied to all successful applicants,
2. they must show proficiency in English by scoring 550 or higher on the TOEFL examination or successfully completing the exit examination for the advanced level of the Intensive English as a Second Language Program at the University of Louisville, and
3. they must present evidence of financial resources adequate to support their educational and living expenses in the United States for the duration of their studies. The award of a University Fellowship or Graduate Assistantship is considered evidence of adequate financial resources.

Residence Facilities

For complete information regarding accommodations and for application forms inquiries should be addressed to the Residence Administration, Belknap Campus, University of Louisville, Louisville, KY 40292.

Student Health and Insurance

The Student Health Service offers the following two plans to meet students' health care needs:

1. **The Comprehensive Broad Plan** is a major medical and hospitalization plan which has coverage for both inpatient and outpatient services. This plan also provides coverage at the Student Health Service on Belknap Campus, and the Family Practice Clinic on the Health Sciences Campus. The Louisville-Area Columbia Hospitals, in conjunction with this plan, have agreed to provide an even greater benefit package when the participating Columbia Hospitals are chosen for treatment or surgery. Similar to an HMO, a referral is necessary for services rendered outside of the Student Health Service.
   To be eligible for coverage under the Comprehensive Broad Plan one must be one of the following: a part-time student enrolled in a degree program, an undergraduate or graduate student taking 6 or more credit hours. Dependent coverage is available. Please call Student Health at (502) 852-6481.
2. **The Health Service Plan** is not a hospitalization plan and will not cover any hospital services. However, this is an excellent plan for those whose current insurance coverage has a large deductible or does not cover wellness care. This plan covers physician's office visits at the Student Health Service and offers discounts on the labs and medications the Student Health Service provides.

The Student Health Service operates 12 months of the year and is staffed by two full-time physicians. Office hours are from 8:30 a.m. to 5:00 p.m., Monday through Friday, with reduced hours during the summer. Patients must be signed in one-half hour before closing to see a physician. Services are provided on a walk-in basis with the exception of pap smears and physicals, which are scheduled by appointment. The Student Health Service is located in the Student Health & Counseling Building on Belknap Campus between the Student Activities Center and the Houchens Building. For more information, please call Student Health at (502) 852-6479.

Student Affairs

Many of the services available to students at the University of Louisville are administered by the Vice President for Student Affairs, whose office is on the second floor of Grawemeyer Hall. The Division of Student Affairs is responsible for admission, orientation, financial aid, registrar services, housing, academic services for athletics, group and individual testing, career planning services, job placement, counseling, disability resources, multicultural services, services to adult and commuter students, student activities, intramural and recreational sports, student communications, services to student organizations, greek affairs, spirit groups, service learning opportunities and legal assistance to students.

Residency Policy and Fees

Classification of Residency for Admission and Tuition Assessment Purposes

Necessity and Function
Public institutions of higher education were established and are maintained by the Commonwealth of Kentucky primarily for the benefit of qualified residents of Kentucky. The substantial commitment of public resources to higher education is predicated on the proposition that the state benefits significantly from the existence of an educated citizenry. As a matter of policy, access to higher education is provided so far as feasible at reasonable cost to residents of the state. It is the long-standing practice of the Council on Higher Education to require students who are not Kentucky residents to meet higher admission standards and to pay a higher level of tuition than resident students. The Commonwealth of Kentucky uses residency requirements to determine items such as voting rights, income tax liability, and employment in certain occupations. The requirements vary in form and substance for each of these uses. The purpose of this regulation is to establish a process and corresponding criteria for the residency classification of students seeking admission to, or enrollment in, public institutions of higher education. Furthermore, it is the intent of the Council on Higher Education that this regulation be interpreted and applied in a uniform manner, as described herein, in determining whether students shall be classified as residents or nonresidents for admission and tuition assessment purposes.

Section 1. Definitions. The language of this regulation on residency classification contains some legal terms as well as everyday terms which have specialized meaning in the determination of residency for admission and tuition assessment purposes. The following definitions apply in the interpretation and application of this regulation:

1. "Academic term" means a division of the school year during which a course of studies is given, e.g., semester, quarter, or intersession.
2. Enrollment at a college or colleges shall be deemed "continuous" if the person claiming "continuous" enrollment continues to be enrolled at the same degree level for consecutive terms (excluding summer) since the beginning of the period for which continuous

enrollment is claimed. The sequence of continuous enrollment is broken if the student fails to enroll, except under extenuating circumstances beyond the student's control, e.g., serious personal illness or injury, or illness or death of parent.

3. "Degree level" means one (1) of the following:
   a. Undergraduate (enrollment in courses or programs which result in the baccalaureate degree or lower);
   b. Graduate (enrollment in courses or programs which result in a postbaccalaureate degree other than the first-professional degrees in law, medicine, and dentistry); or
   c. Professional (enrollment in courses or programs which result in a professional degree in law, medicine, or dentistry).
4. The term "dependent person" means a person who is unable to meet all of the criteria listed in subsection (9) of this section.
5. "Documentation" refers to the submission of source documents, e.g., official letters, papers, or sworn statements. As a general rule, evidence cited as the basis for domicile shall be documented, and the required documentation shall accompany the application for residency classification.
6. The term "domicile" means a person's true, fixed, and permanent home. It is the place where the person intends to remain, and to which the person expects to return without intending to establish a new domicile elsewhere. "Legal residence" and domicile convey the same notion of permanence and are used interchangeably.
7. "Full-time employment" means employment for at least forty-eight (48) work weeks at an average of at least thirty (30) hours per week.
8. "Half-time enrollment" means any enrollment during an academic term which is equal to one-half (1/2) of full time as determined by the governing board of the institution.
9. The term "independent person" means a person who meets all of the following criteria. An independent person is one:
   a. Whose parent has not claimed such person as a dependent on federal or state income tax returns for the tax year preceding the date of application for reclassification of residency status;
   b. Who demonstrates no financial dependence upon parent(s); and
   c. Whose parents' income is not taken into account by any private or governmental agency furnishing educational financial assistance to the person, including scholarship, loans, and other assistance.
10. The terms "institution", "institution of higher education", or "college" refer to all institutions, public or private, offering instruction and conferring degrees beyond the secondary school level, such as four (4) year colleges or universities, seminaries, two (2) year institutions (community colleges and junior colleges), and postsecondary vocational-technical schools.
11. The term "nonresident" means a person who currently maintains legal residence outside Kentucky or has not met the criteria for establishing residency as defined in this regulation.
12. The term "parent" means one (1) of the following:
    a. a person's father or mother, or
    b. a court-appointed legal guardian.
    The term "parent" shall not apply if the guardianship has been established primarily for the purpose of conferring the status of resident on a person.
13. The term "resident" means a person who is a legal resident of Kentucky based upon fulfilling the criteria for establishing residency as set out in Section 2 of this regulation.

Section 2. Guidelines for Determination of Residency.

1. Initial classification of residency shall be determined based upon the facts existing when the conditions governing admission for a specific academic term have been met. Initial residency determinations generally are made on the basis of information derived from admissions materials. An undergraduate student whose admissions records show the student to be a graduate of an out-of-state high school is presumed to be a nonresident and shall be initially so classified. A student whose admissions records indicate the student's domicile to be outside of Kentucky at time of application is presumed to be a nonresident and shall be initially so classified.
2. The domicile of a dependent person is that of either parent. The domicile of the parent shall be determined in the same manner as the domicile of an independent person.
3. The domicile of a dependent person whose parents are divorced, separated, or otherwise living apart shall be presumed to be Kentucky if either parent is a resident of the Commonwealth regardless of which parent has legal custody or is entitled to claim that person as a dependent pursuant to Kentucky income tax provisions.
4. Evidence submitted on behalf of a dependent person shall pertain to the domicile of the parent(s). A person claiming independent status shall document that proclaimed status and demonstrate that domicile in Kentucky has been established.
5. Any dependent person whose parent(s), having domicile in this state, moves from this state shall be entitled to classification as a resident while in continuous enrollment at the degree level in which currently enrolled. When continuous enrollment is broken or the current degree level is completed, the person's residency classification shall be reassessed in accordance with the appropriate sections of this regulation.
6. An independent person who moves to Kentucky and within twelve (12) months enrolls in an institution of higher education more than half-time shall be presumed to have come to Kentucky primarily for educational purposes rather than to establish domicile in Kentucky. Such person shall be classified as a nonresident unless establishment of a Kentucky domicile can be demonstrated in accordance with Section 3 of this regulation.
7. Upon moving to this state, an independent person who provides clear and convincing evidence of domicile shall be eligible for resident classification of self, spouse, or dependent children, provided that any of these persons is not in this state primarily as a student. A person who moves to Kentucky primarily for the purpose of enrollment of either self, spouse, or dependent in an institution of higher education shall not be granted resident classification unless such person can demonstrate establishment of a Kentucky domicile in accordance with Section 3 of this regulation.
8. If an independent person or the parent of a dependent person moves out-of-state, domicile, having been established in Kentucky, is retained until steps are taken to establish domicile elsewhere. The same facts and conditions which are presumed in establishing a Kentucky domicile are similarly presumed in determining when a former Kentucky domicile has been abandoned. In the absence of clear and convincing evidence as to the domicile of an independent person who at one time had domicile in Kentucky, that person is presumed to have lost Kentucky domicile upon a one (1) year absence from the state.
9. An individual shall not be deemed to have established domicile in this state solely by reason of marriage to a Kentucky resident. However, the fact of marriage to a Kentucky resident shall be deemed relevant evidence to be considered in ascertaining domiciliary intent. A student initially classified as a nonresident who marries a Kentucky resident shall be eligible for resident classification if the requisite criteria listed in Section 3 of this regulation are met.
10. Given transfer to, or matriculation in, another Kentucky public institution of higher education, the student's residency classification shall be reassessed by the receiving institution.
11. An individual whose domicile was Kentucky at the time of induction into the military, and who maintains Kentucky as home of record and permanent address, shall be entitled to resident status if the individual returns to this state within six (6) months of the date of discharge from active duty.
12. A member or the spouse of a member of the Armed Forces of the United States stationed in Kentucky on active military orders is considered domiciled in the state and shall be entitled to classification as a resident while the member is on active duty in this state pursuant to such orders. The spouse of the member, while in continuous attendance at the degree level in which currently enrolled, shall not lose resident status when the member is thereafter transferred on military orders. Individuals classified under this section shall be reassessed in accordance with the appropriate sections of this regulation when the qualifying condition is terminated. This regulation is invalid if the individual is stationed in Kentucky for the purpose of enrollment at an institution of higher education or on temporary assignment of less than one (1) year.
13. A dependent person whose parent is a member of the Armed Forces and stationed in this state on active duty pursuant to military orders shall be classified as a resident. The student, while in continuous attendance at the degree level in which currently enrolled, shall not lose resident status when the parent is thereafter transferred on military orders. When continuous attendance is broken or the current degree

level is completed, the person's residency classification shall be reassessed in accordance with the appropriate sections of this regulation. This subsection does not apply if the parent is stationed in Kentucky for the purpose of enrollment at an institution of higher education or on a temporary assignment of less than one (1) year.

14. Any person holding a permanent residency visa or classified as a political refugee has the capacity to remain in Kentucky indefinitely and shall establish domicile in the same manner as any other person. Time spent in Kentucky and progress made in fulfilling conditions of domicile as stated in Section 3(1) prior to obtaining permanent status may be considered in establishing Kentucky domicile.
15. Any person holding a nonimmigrant visa with designation A, E, G, H, I, or L may remain in Kentucky as long as the authorized purpose or established need continues and may establish domicile the same as any other person. In assessing the residency status of such a person, other sections of this regulation shall apply and the person's purpose and length of stay as well as other conditions governing presence in Kentucky shall be determined and considered. If this review justifies a resident classification, the person shall be classified as a resident for admission and tuition assessment purposes.
16. Any person holding a nonimmigrant visa with designation B, C, D, F, J, K or M does not have the capacity to remain in Kentucky indefinitely and may not attain Kentucky resident status for admission and tuition assessment purposes.
17. Pursuant to KRS 164A.330 and 200 KAR 16:040, beneficiaries of a Kentucky Educational Savings Plan Trust shall be granted resident classification for tuition purposes if:
    a. The beneficiary is covered under a vested participation agreement;
    b. The beneficiary has been a continuous resident of the Commonwealth of Kentucky during the eight (8) year vestment period; and
    c. The beneficiary enrolls in an institution of higher education in Kentucky prior to enrollment in any other educational institution.
18. No independent person shall be presumed to have gained resident status while being enrolled in any institution of higher education more than half-time in the absence of clear and convincing evidence that the person has established domicile in Kentucky.
19. Domicile shall not ordinarily be conferred by the performance of acts which are auxiliary to fulfilling educational objectives or are performed as a matter of convenience. Mere physical presence in Kentucky (including living with relatives or friends) is not sufficient evidence of domicile.

Section 3. Types of Evidence to be Considered for Establishment of Domicile.

1. Evidence submitted on behalf of a dependent person shall pertain to the domicile of either parent. Initial classification generally are made on the basis of information derived from admissions materials, and individuals who enroll in college immediately following graduation from high school and remain enrolled are treated as dependent persons unless the contrary is evident from the information submitted. In such cases, domicile shall be inferred from the student's permanent address, parent's mailing address, or location of high school of graduation.
2. A person claiming independent status shall document independent status under Section 1(5) of this regulation and shall demonstrate by clear and convincing evidence that domicile in Kentucky has been established by that person's acts. If an independent person asserts that domicile in Kentucky has been established, the person has the burden of proving that assertion by clear and convincing evidence.
3. The determination of domicile shall be based upon verifiable circumstances or actions. No single fact is paramount, and each situation shall be evaluated to identify those facts which are essential to the determination of domicile.
4. The following facts, although not conclusive, shall have probative value in support of a claim by an independent person for resident classification:
    a. Acceptance of an offer of full-time employment or transfer to an employer in Kentucky or contiguous area while maintaining domicile in Kentucky;
    b. Continuous physical presence in a nonstudent status for the (twelve) 12 months immediately preceding the last date for enrollment in an institution;
    c. Filing of Kentucky resident income tax return for the calendar year preceding the date of application for reclassification of residency status;
    d. Full-time employment of at least one (1) year while living in Kentucky;
    e. Attendance as a full-time, nonresident student at an out-of-state institution of higher education while determined to be a resident of Kentucky;
    f. Abandonment of a former domicile and establishing domicile in Kentucky with attendance at an institution of higher education following and only incidental to such change in domicile;
    g. Payment of occupational taxes in Kentucky;
    h. Payment of real property taxes in Kentucky;
    i. Payment of intangible personal property taxes in Kentucky;
    j. Ownership of real property in Kentucky, if the property was used by the student as a residence for at least six (6) months preceding the date of application for reclassification of residency status;
    k. Long-term lease (at least twelve [12] consecutive months) of noncollegiate housing;
    l. Kentucky automobile registration;
    m. Kentucky driver's license;
    n. Continued presence in Kentucky during vacation periods;
    o. Marriage to a Kentucky resident; and
    p. Registration as a Kentucky voter.
5. Documentation. The determination of domicile shall be based upon verifiable circumstances or actions, and a student may be required to submit original or notarized copies of any relevant evidence pertaining to domicile. When reviewing the documentation submitted, institutions may request additional documentation to clarify the person's circumstances and to formulate a classification decision which considers all relevant facts.
6. Submission of False Documents. A student who gives incorrect or misleading information to institution officials may be subject to criminal prosecution and to such disciplinary sanctions as may be imposed by the institution, which shall include but not necessarily be limited to the payment of nonresident tuition for each academic term attended.

Section 4. Responsibilities

1. Institution Responsibilities. Each institution shall designate an administrative office or person with delegated day-to-day responsibility for administration of this classification regulation and for evaluating and deciding student requests for reclassification. Each institution shall also establish a residency review committee (hereafter the committee) to assist and recommend action on student requests for reclassification referred to the committee by said administrative office or person having day-to-day responsibility for this regulation. To evaluate student requests for reclassification, each institution shall establish an operational policy including procedures and designated responsibilities. The Council on Higher Education Residency Classification Policy shall be published in its entirety in the official bulletin(s) of each institution.
2. Student Responsibilities. The responsibility for registering under the proper residency classification is that of the student. It is the student's obligation to raise questions concerning residency classification and make application for change of residency classification with the administrative officials of the institution. A student classified as a resident who becomes a nonresident shall be required to notify immediately the proper institutional officials. However, if the student fails to notify institutional officials of the change in status, institution officials may investigate and evaluate the current status of the student regardless of the source of the information. A student classified as a nonresident is considered to retain that status until the student makes written application for reclassification in the form prescribed by subsection (3) of this section and is officially reclassified by the proper administrative officials.
3. Request for Reclassification. Application for change of residency classification shall be made to the administrative office or person designated by the institution for this purpose. Such application with supporting documentation shall be made by the student not more than thirty (30) calendar days after the first day of classes of the academic term for which reclassification is sought. A student may apply for reclassification only once during the academic term for which reclassification is requested.
    a. To support full consideration of a request for a change in residency classification, each application shall consist of a complete affidavit which includes the necessary documentation to substantiate facts cited for reclassification. Each applicant is encouraged to submit a formal statement indicating the basis for the claim of resident status. The student shall be responsible

for ensuring that all necessary documentation is submitted with the affidavit. Incomplete applications may be returned to the student for completion at the discretion of appropriate institutional officials.

b. Applications for reclassification shall be reviewed according to institutional policy. When applications for reclassification are referred to the committee, the student shall be notified in writing as to the committee's decision on the application. The committee's written decision on residency shall include findings of fact, and determination of whether the applicant is deemed to be a "dependent person" or "independent person," whether the applicant is a "resident" or "nonresident," and the reason(s) based upon this regulation for said determinations. If an application results in a change of classification from nonresident to resident, such change shall not be made retroactive beyond the academic term in which application for resident classification is made. A student denied resident classification by the committee shall have the right to appeal such decision to the Council on Higher Education.

Section 5. Procedure for Appeal to the Council on Higher Education.

1. The Executive Director of the Council on Higher Education shall appoint a person to serve as an appeals officer. The appeals officer shall review all residency appeals from the public institutions of higher education to determine if the committee's written decision is supported by substantive evidence and in conformity with this regulation.
2. After the student receives the decision of the committee, the student has fourteen (14) calendar days in which to appeal that decision to the Council on Higher Education. The student initiates this process by giving written notice to the chair of the committee or the person or office designated by the institution to handle such appeals. Appeals filed more than (fourteen) 14 calendar days after receipt of the decision of the committee shall be dismissed and the decision of the committee shall be final.
3. The committee or its designated representative shall be responsible for forwarding to the Council on Higher Education a complete copy of the student's file within fourteen (14) calendar days of the receipt of a notice of appeal. The student may review the content of the file before it is forwarded to the Council on Higher Education.
4. The appeal shall be considered on the written record alone and new or additional evidence shall not be considered.
5. The appeals officer shall review the written record and the committee's written decision and shall make a recommendation to affirm, modify, or reverse the committee's decision. The appeals officer may order the appeal remanded to the committee for further proceedings before the appeals officer renders a recommendation. Within twenty-one (21) calendar days after receipt of the student's file, the recommendation of the appeals officer shall be forwarded to the Executive Director of the Council on Higher Education or designated representative. The Executive Director of the Council on Higher Education or designated representative shall promptly forward the recommendation of the appeals officer to the institutional representative designated to handle appeals for final disposition by the institution in accordance with established institutional procedures.
6. The institutional representative shall promptly forward the recommendation of the appeals officer to the student. Each party (the institution and the student) shall have ten (10) calendar days after receipt of the appeals officer's recommendation to file written exceptions to the report with the institutional representative designated to handle final disposition of appeals. The institution shall make final disposition of the appeal and notify the student within thirty (30) calendar days after expiration of the ten (10) day period for filing exceptions.

Section 6. This regulation supercedes all previous policies and regulations of the Council relating to residency classification of students for tuition assessment purposes. Please consult the University of Louisville web site for most current regulations, or you may obtain the latest version from the Office of Student Services.

Tuition and Fees

Fees and Expenses

For fee purposes, determination of "undergraduate' or "graduate" status is based on the school or enrollment unit to which a student is admitted; not on the level of courses taken.

1999-2000 Registration Fees

	Resident	Non-Resident
Undergraduate Students registering for 12 or more credit hours per semester	$1,623.00 *	$4,583.00 *
Students registering for 9 or more credit hours: Graduate, Kent School, Speed Graduate Professional per semester	$1,773.00 *	$5,033.00 *
Hourly rate for students registering in: Undergradute schools per credit hour	$133.00**	$380.00**
Hourly rate for students registering in: Graduate, Kent School, Speed Graduate Professional: per credit hour	$194.50**	$556.50**

Additional course fees are listed under courses where applicable. These fees may be added or changed without prior notice. The above fee schedule does not apply to the schools of Dentistry, Medicine, and Law.

*** The above tuition charges include:**
Student Activity Fee — $14.00 per semester prorated per credit hour
Student Service Fee — $59.00 per semester prorated per credit hour
Student Computer Fee — $40.00 per semester prorated per credit hour
Student Building Fee — $15.00 per semester prorated per credit hour
University Facility Fee — $15.00 per semester prorated per credit hour

**** The above tuition charges do not include:**
Student Building Fee:
$7.50 per semester for students taking 0-6 credit hours
$15.00 per semester for students taking 7 or more credit hours
University Facility Fee:
$7.50 per semester for students taking 0-6 credit hours
$15.00 per semester for students taking 7 or more credit hours

Note: University fees and refunds are subject to approval by the Board of Trustees and may be changed without prior notice. The current Schedule of Courses should be consulted for the most current information.

Degree Application Fees

Each master's degree applicant is charged a fee of $25.00.

Each Ph.D. applicant is charged a fee of $35.00.

If an applicant does not receive the degree, the charge will be adjusted to $10.00. *The candidate must reapply for the degree to be granted at a later time and pay the full application fee at that time.*

Candidacy Fees

Doctoral Candidacy Status Fee $50.00
Master's Candidacy Status Fee $20.00
Reinstatement to Candidate Status* $25.00

* Reinstatement fee is applied to each semester in which a student who was required to register for candidacy fails to do so.

Privilege Fees

Examination for extramural credit: 1/2 regular course fee
International Student Fee:
—Fall/Spring $50.00
—Summer $25.00
Reinstatement $25.00
Replacement diploma $20.00
Transcript:*
—Former students $4.00
—Currently enrolled students $2.00

* The first transcript ordered after a degree is completed is free if ordered within one year after the degree is granted.

Registration and Financial Settlement

Early Registration
Current and previously enrolled students may register for the upcoming semester or term during the current semester by participating in early registration. Students generally have a better chance of getting the courses they want at the desired times during this period. Most currently enrolled students are mailed a Schedule of Courses for the upcoming academic year, which includes instructions for advising and registration.

At the end of Early Registration, student schedules and statements of account are mailed approximately 14 days before the published due date. Students are advised to consult the Early Registration calendar in the Schedule of Courses to determine these dates.

Financial settlement is required by the due date to finalize early registration. If a student's courses are dropped for non-settlement, the student must register during regular registration prior to the beginning of the term.

Regular Registration
Students who do not participate in Early Registration may register for courses in the days immediately preceding the start of the semester. Students should consult the Schedule of Courses for procedures to register in this fashion.

Drop/Add
A student's drop/add must be approved according to the procedure for the academic unit in which the student is enrolled. Students may consult the Schedule of Courses for detailed information concerning unit procedures for drop/add and for permission to enter closed classes.

Financial Settlement

Payment Policy
Tuition and fees are due on, or before, the designated due date on the Statement of Account. Payment may be made by cash, check, money order, charge card (MasterCard or Visa), or financial aid credit. Payment must be accompanied by the top portion of the Statement of Account. Payments may be made by mail, by use of the deposit box located in the front entrance of the Houchens Building, or at the Office of the Bursar. Refer to information in the Schedule of Courses for financial settlement options.

Students who early register will be mailed statements of account; failure to receive the Statement of Account will not relieve the student of the responsibility for making financial settlement by the designated due date. Early Registrations which are not financially settled by the designated due date may be cancelled and class spaces made available for DROP/ADD & REGISTRATION.

Drop/Add & Regular Registration
Information regarding Financial Settlement of tuition and fee charges (including housing charges) will be given on the Touch-Tone system.

Students who register during DROP/ADD & REGISTRATION will not have their registrations cancelled for non-payment. Students will incur a financial obligation for their period of enrollment. Please refer to the TUITION/FEE REDUCTION SECTION in the Schedule of Courses. A late payment fee of $50.00 may be assessed when student accounts are not paid by the established semester deadline.

Short-Term Loan
You may participate in this program by paying 33 1/3% (thirty-three and one-third percent) of your anticipated charges for the semester, a processing fee of $25.00 *(non-refundable),* and any other amounts due. Questions regarding the exact down payment required to participate in this program should be directed to the Bursar's Office (852–6503). Students may consult the Schedule of Courses under the Financial Settlement Options for more information on this loan program.

Short term loans are not offered during the Summer semester.

Financial Aid
If financial assistance is required, applications may be obtained from the Office of Student Financial Aid. The formal application period for financial assistance for the following academic year is January 1 to March 15. Applications submitted after March 15 will be evaluated subject to the availability of funds. Applications and information are available from the Student Financial Aid Office, Belknap Campus, University of Louisville, Louisville, KY 40292.

Financial Aid Recipients
Determination regarding refunds of credit balances will be based on regulations governing the financial aid awarded to the student.

Checks
The Bursar's Office will accept a check for payment of University accounts. Postdated checks will not be accepted, nor will any check be held for deferred deposit. The student who presents to the University a check later returned by the bank unpaid will be charged an additional fee for each such check. If such a check and penalty are not paid promptly, the student will be subject to legal action. Louisville banks require time to clear checks written on accounts in out-of-city banks before they will honor checks drawn on newly opened accounts.

Additional financial settlement options, including third party billing, and senior citizen tuition remission, are described in the Schedule of Courses.

Financial Penalities
The Registrar's Office may discontinue services, including the privilege of registration, to persons having a past-due University account. A late payment fee of $50.00 may be assessed when student accounts are not paid by the established semester deadline.

Withdrawal

Withdrawal Policy
The effective withdrawal date is the date on which the Registrar's Office, or its designated representatives during evening hours and at external campus offices, receives the appropriately signed drop form, or the date the drop/withdrawal is processed through the touch-tone system. This date is used in calculating any refund or tuition reduction due if withdrawal deadlines are met.

The last day to withdraw for each semester is published in the Schedule of Courses, and for normal duration courses, is set in the eighth week of the semester.

A grade of "W" will be reflected on students' official transcripts for all courses officially dropped after the end of late registration.

Students who make a complete withdrawal from all courses for a particular semester must process this in accordance with the procedures established by their academic unit. At the time of withdrawal, the students should present their student identification card for the current semester validation sticker to be removed. The permanent identification card will be returned to the student.

When a student officially withdraws (see definition of effective withdrawal date above) from the University or from any course, or courses, for which hourly rates apply, tuition and student activity fee charges and credits will be adjusted in the following manner:

	Semester Charge	Tuition Credit
Withdrawal through 10% of the term	0%	100%
Withdrawal through 25% of the term	50%	50%
Withdrawal through 50% of the term	75%	25%
Withdrawal after 50% of the term	100%	0%

Summer terms and some regular semester courses vary in length and the percentages of refunds are modified. Effective dates are printed for special terms and courses in the Schedule of Courses or are available from the Registar's Office.

This policy applies to all tuition and to the student activity fee except for non-refundable deposits. Special course fees, laboratory fees and the Student Building fee are refundable only with 100% adjustment.

Graduate Training Assistantships

Graduate teaching, research, and service assistantships are available to qualified students in most graduate programs. These assistantships provide tuition remission and a stipend that is adequate to cover basic living expenses.

Applicants who are interested in being considered for assistantships, should write to the chair or graduate advisor of the department to which they are applying for admission, stating their desire to be appointed as a graduate assistant. The award of an assistantship is competitive; students who hope to be considered should present credentials that are well above the minimum required for admission.

The purpose of a graduate assistantship is to provide experience and training that augment a student's academic program. The department chair or graduate advisor will attempt to place a student in an assistantship believed to best serve the career training objective of the student. Although a student is free to make known a preference for a particular placement, the final decision is the prerogative of the department in which the student is enrolled.

The distribution of assistantships across departments may differ from year to year. Moreover, some departmental policies require that a student complete 9-18 graduate credit hours in the program before being eligible for an assistantship.

Resigning Appointments
As a member of the Council of Graduate Schools in the United States, the University of Louisville subscribes to the Resolution Regarding Scholars, Fellows, Trainees, and Graduate Assistants:

> Acceptance of an offer of financial support (such as a graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by a prospective or enrolled graduate student completes an agreement that both student and graduate school expect to honor. In that context, the conditions affecting such offers and their acceptance must be defined carefully and understood by all parties.
>
> Students are under no obligation to respond to offers of financial support prior to April 15; earlier deadlines for acceptance of such offers violate the intent of this Resolution. In those instances in which a student accepts an offer before April 15, and subsequently desires to withdraw that acceptance, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another appointment without first obtaining a written release from any previously accepted offer. It is further agreed by the institutions and organizations subscribing to the above Resolution that a copy of the Resolution should accompany every scholarship, fellowship, traineeship, and assistantship offer.

Scholarships and Fellowships

University Fellowships
A limited number of University fellowships may be awarded to outstanding students in the doctoral programs. These carry a generous stipend and full tuition remission. Nominations are made each spring to the Dean of the Graduate School by the chairs of departments granting the doctorates. Students who wish to be considered for fellowships should submit all credentials by March 1.

The Allen R. Hite Scholarships
Ten thousand dollars annually is awarded for partial- and full-tuition scholarships to qualified graduate and undergraduate students majoring in creative art or in art history. Full-time and part-time students will be considered for these awards. A Hite Scholarship application and the Kentucky Financial Aid Form must be submitted by all candidates to the Director of the Allen R. Hite Art Institute. In addition, entering students are required to include examples of their work, at least two letters of recommendation, and transcripts of all courses, college level and above. All applications and supporting materials must be received before March 15.

Scottish Rite Foundation Fellowships
This is a fellowship program for new applicants and currently enrolled student in the Educational Administration doctoral program. Recommendations of potential fellows to the Foundation will be made the first week of April and the successful candidate(s) will be notified before Fall registration. Applications are available in the Dean's Office at the School of Education.

Gerhard Herz Scholarship in Music History
The scholarship is awarded annually for graduate study in Music History at the University of Louisville to a student with a degree in music (B.M., B.A., B.M.Ed.) with preference given to a graduating senior in the School of Music or Division of Humanities. Qualifications for consideration include a grade point average of 3.5 and a combined score of 1000 on two segments (verbal plus either quantitative or advanced music) of the Graduate Record Examination.

The Alfred and Iva Homberger Memorial Fellowships in the Department of Biochemistry
These are fellowships in the Department of Biochemistry, in the School of Medicine, for students who have graduated from an accredited college with a major in chemistry or who are graduates of an accredited medical school.

Moritz von Bomhard Fellowship in Music Composition
A two-year award to a student working for a Master of Music degree with an emphasis in operatic composition. To be considered candidates must have an earned undergraduate degree in music composition and a portfolio of work demonstrating inclination and ability to compose for a human voice. One-year stipend and tuition waiver renewable for a second year.

Warren Babb Award in Music Composition

Financial Aid

Students who wish to explore or inquire about additional forms of financial assistance should contact the Student Financial Aid Office, University of Louisville, Louisville, Kentucky 40292 or visit the Financial Aid Home Page. Phone: (502) 852-5511.

University Policies and Procedures

Academic Grievance Procedure

The Graduate School follows the procedures for academic grievance as published in The Redbook, Chapter 6, Article 8. This policy is stated below. Any student considering filing such a grievance is advised to consult with the Graduate School Grievance Officer for advice and information. The Graduate School Grievance Committee is the committee of original jurisdiction for issues involving graduate students enrolled for graduate credit.

Section 1: Introduction
This procedure is designed to provide fair means of dealing with student complaints regarding a specific action or decision made by the faculty or a faculty member. "Students who believe they have been treated unfairly, discriminated against, or have had their rights abridged may initiate a grievance" (The Redbook, Section 6.8.1).

The Unit Academic Grievance Committee has the power to hear all grievances involving academic matters other than substantive grade appeals. "Academic matters are defined as those concerning instructional activities, research activities, activities closely related to either of these functions, or decisions involving instruction or affecting academic freedom" (The Redbook, Section 6.8.3). The Unit Academic Grievance Committee may review allegations that a course grade has resulted from an unfair procedure. However, the committee should not substitute its judgment on their merits as an evaluation of academic performance. Where the dean concurs that procedural irregularities have occurred, the dean shall consult with an appropriate faculty committee as to the grade to be recorded in the student's official transcript. To assist the student, a Student Grievance Officer is provided, who is responsible for "informing students of their rights and obligations under the grievance procedure and especially the deadlines that have been established. The Student Grievance Officer shall seek to resolve informally as many grievances as possible" (The Redbook, Section 6.8.2). Students are encouraged to seek the assistance of the Student Grievance Officer at any stage of the grievance process.

Each unit shall establish an Academic Grievance Committee to carry out the procedures described below.

Section 2: Preliminary Steps
To pursue a grievance concerning academic matters within the academic unit, the following steps of the grievance procedure should be observed:

1. The student should first discuss the matter with the person involved and attempt to resolve the grievance through informal discussion.
2. If there is no resolution, the student should discuss the matter with that person's supervisor or the person to whom such person reports, who should attempt to mediate a resolution.
3. If the student has not been able to obtain a resolution, he or she may request the Student Grievance Officer (S. G. O.) to attempt informal mediation of the problem.
4. If the matter has not been satisfactorily resolved through the informal process, the student shall submit a written statement of the grievance to the Unit Academic Grievance Committee through the Office of the Dean. The statement shall contain:
   a. A brief narrative of the condition giving rise to the grievance;
   b. designation of the parties involved; and
   c. statement of the remedy requested.

Section 3: Committee Action
Upon receipt of the written statement, the Unit Academic Grievance Committee, or its representatives, shall:

1. Contact the student and the Student Grievance Officer to obtain assurance that all steps of the above informal process were completed and that those issues in the statement were discussed at all levels.
2. Notify the parties named in the statement of the grievance naming them; and send a copy of the statement to the named parties and to all committee members.
3. Notify the grievant and the respondent of the right to challenge committee members for cause, and request early notification of challenge(s) to expedite the grievance procedure. Included in this notification will be a list of the names of all current, regular committee members.
4. Meet within twenty working days after receiving the written statement of any grievance and recommend to the dean of the unit whether sufficient grounds exist to accept a case for hearing. The committee shall hear the case when the dean concurs. The committee shall notify, in writing, all persons directly involved as to the reasons for its recommendation.
5. The action of the grievance committee as to whether to grant a hearing when accepted by the dean of the unit shall be final and binding on all parties except when subject to the condition of appeal.
6. If a hearing will be held, notify in writing all the parties involved, including any witnesses, of the date, time and place of the hearing at least ten days prior to the hearing date (which shall be within 30 working days of receipt of the written grievance).
7. Request in writing from all parties involved any pertinent material deemed necessary for review by the committee prior to the hearing. These materials, and any additional materials either party chooses to submit, must be submitted to the committee not later than four days prior to the hearing. Any person named in a grievance may submit a written statement to the committee outlining issues from that person's perspective.
8. Maintain confidentiality throughout the entire grievance process.

All communications among the committee, the grievant(s), and the person(s) named in the statement of grievance will be confidential.

Section 4: Hearing Process
All hearings conducted by the Unit Academic Grievance Committee shall be conducted confidentially in the following manner:

1. The grievant(s) and the respondent(s) must be present during the information-gathering portion of the hearing. Witnesses will be available and will be called when needed. The committee reserves the right to allow the presence of a secretary or a technical assistant.
2. All statements during the information-exchange phase of the hearing will be tape-recorded. This record will be preserved in the University Archives for a minimum of five years and shall be confidential.
3. Any committee member may question any of the participants at the hearing.
4. The grievant will present his or her statements and/or witnesses to the committee.
5. The respondent will have the opportunity to question the grievant(s) and the witnesses about their statements.
6. The respondent will present his or her statements and/or witnesses to the committee.
7. The grievant will have the opportunity to question the respondent(s) about their statements.
8. After all information is exchanged, all persons except the committee members and the recording secretary will leave the committee room. The grievant(s), the respondent(s), and the witnesses will continue to be available to the committee should further information be needed.
9. The committee will meet in closed session to decide upon its recommendation(s) to the dean.
10. The committee shall submit its report with recommendation(s) and reasons for the recommendation(s), to the grievant(s), the respondent(s), and the dean. If the grievance directly involves the dean, the report and recommendation(s) of the Unit Academic Grievance Committee shall be referred for decision to the appropriate academic vice-president (now referred to as the University Provost).
11. The student's grievance will not be included as part of the student's record, unless it results in a change in student status or the student voluntarily inserts the information.
12. Until the grievance is resolved, the student may continue the natural academic progression through the academic unit, subject to the requirements of Article 6.6, "Academic Review, Advancement, Probation, and Dismissal of Students," and Article 6.7, "Nonacademic Disciplinary Procedures," of The Redbook.

Section 5: Decision
The dean shall approve or reject the committee's recommendation(s) within 28 days after receiving it (them). If the decision of the dean is not in accord with the committee's recommendation(s), the dean shall state the reasons for that decision, in writing, to all persons directly involved in the grievance and to the committee. The dean shall then take appropriate action to implement his or her decision after the time for appeal has elapsed.

Section 6: Rehearing
A grievance committee, within 21 days after delivery of its report, may be petitioned to reconsider its decision upon the basis of evidence of misrepresentation of materials, facts, or upon the basis of newly discovered evidence clearly not available at the original hearing.

Section 7: Appeal
Any party to the grievance may appeal to the University Student Grievance Committee within 21 days from the date of the final decision of the dean if the dean's decision does not concur with the recommendation of the grievance committee.

Student Grievance Officer

The University of Louisville Student Grievance Officer is a full-time tenured faculty member who is responsible for informing students of their rights and obligations under the University Student Grievance procedure and especially the deadlines that have been established.

The Grievance Officer will assist the student in efforts to achieve informal resolution in as many academic or non-academic complaints possible. One of the main goals of the Student Grievance Officer is to establish an understanding among students, faculty, staff and administration when there is conflict.

Problems pertaining to grades, financial aid, University parking, housing, food services, registration, etc., may all be discussed with the Student Grievance Officer as a means of seeking direction for the pursuit of a resolution. Any aspect of the University that creates a problem for students is a matter of concern for the Student Grievance Officer.

This service is available to all students. The Student Grievance Officer maintains office hours on Tuesdays and Thursdays from 3:00–5:00 pm and Wednesdays from 8:00–10:00 am. An answering machine is on 24 hours a day so every call is received, noted and returned, if necessary. Phone 852-6102.

Code of Student Conduct

The Code of Student Conduct is the University's policy regarding non-academic misconduct and discipline of students. The primary purpose for the imposition of non-academic discipline in the University campus setting is to preserve and protect a quality educational environment. The Code of Student Conduct is published in the Student Handbook and is also available on the worldwide web at http://www.louisville.edu/student code-conduct.html and through the Student Life Office, Student Activities Center, Room W302. If you have any questions or would like information pertaining to reporting an alleged incident of non-academic misconduct, please contact the Associate Director of Student Life at 852–5787.

Code of Student Rights and Responsibilities

Section 1. Purpose
The Code of Student Rights and Responsibilities is set forth in writing in order to give students general notice of certain of their rights and responsibilities at the University of Louisville. Further rights and responsibilities are set forth in other University rules and policies, including the Code of Student Conduct, Residence Hall contracts, and academic unit bulletins. It is the students' responsibility to be aware of all University rules and policies; students should check with the office of the Associate Vice President for Student Life and with their academic units if they have any questions about the purposes or intent of these policies.

The University is a public educational institution for adults rather than a custodial institution. Consistent with the role of the University to educate its students and to stimulate student autonomy and independence, University regulation and supervision of student life on and off campus is limited. The University does not assume responsibility or liability for the conduct of its students; responsibility and liability for student conduct rests with the student as inherent attributes of his or her adult status, concurrently with the student's freedom of choice regarding his or her presence at the University and his or her own conduct and associations.

Section 2. Definitions
When used in this Code:

1. The term "academic dishonesty" means obtaining or seeking to obtain an unfair academic advantage for oneself or for any other student; it includes lying, cheating, stealing, or engaging in otherwise dishonest conduct in the course of or related to any academic exercise.
2. The term "academic exercise" means a test, quiz, examination, speech, presentation, paper, field or laboratory work, or any other academic activity on which a student is evaluated.
3. The term "group" means a number of persons who are associated with each other and who have not complied with the University requirements for recognition as an organization.
4. The term "organization" means a number of persons who are associated with each other and who have complied with the University requirements for recognition.
5. The term "student" means any person taking courses at the University, either full time or part time, pursuing undergraduate, graduate or extension studies on a regular quarter, semester, or summer-term basis.
6. The term "student broadcast" means oral material published on a student operated radio or television station.
7. The term "student press" means either a student publication or a student broadcast.
8. The term "student publication" means written material published by a student organization.
9. The term "teacher" means any person hired by the University to conduct classroom activities. In certain situations, a person may be both "student" and "teacher." Determination of the person's status in a particular situation shall be determined by the surrounding circumstances.
10. The term "University" means the University of Louisville and, collectively, those responsible for its control and operation.

Section 3. Admission and Financial Aid
All applicants for admission and financial aid to the University shall be considered without regard for race, color, national origin, religion, sex, handicap not affecting qualification, or political beliefs.

Section 4. Classroom Rights and Responsibilities
1. A student shall be evaluated on demonstrated knowledge and academic performance, and not on the basis of personal or political beliefs or on the basis of race, color, national origin, religion, sex, age, or handicap not affecting academic performance.
2. A student has freedom of inquiry, of legitimate classroom discussion, and of free expression of his or her opinion, subject to the teacher's responsibilities to maintain order and to complete the course requirements.
3. A student is responsible for fulfilling the stated requirements of all courses in which he or she is enrolled.
4. A student has the right:
   a. To be informed in reasonable detail at the first or second class meeting about the nature of the course and to expect the course to correspond generally to its description in the appropriate University catalog or bulletin;
   b. to be informed in writing and in reasonable detail at the first or second class meeting of course requirements and assignments;
   c. to be informed in writing and in reasonable detail at the first or second class meeting of standards and methods used in evaluating the student's academic performance;
   d. to be informed in writing of any necessary changes in assignments, requirements, or methods of grading during the semester with the reasons for such changes.
5. A student has the right to confidentiality in the student/teacher relationship regarding the student's personal or political beliefs. Disclosures of a student's personal or political beliefs, expressed in writing or in private conversation, shall not be made public without explicit permission of the student.

Charges of violations of these classroom rights and responsibilities shall be handled through the appropriate academic unit level procedures.

Section 5. Academic Dishonesty
Academic dishonesty is prohibited at the University of Louisville. It is a serious offense because it diminishes the quality of scholarship, makes accurate evaluation of student progress impossible, and defrauds those in society who must ultimately depend upon the knowledge and integrity of the institution and its students and faculty.

Academic dishonesty includes, but is not limited to, the following:

1. ***Cheating:***
   a. Using or attempting to use books, notes, study aids, calculators, or any other documents, devices, or information in any academic exercise without prior authorization by the teacher.
   b. Copying or attempting to copy from another person's paper, report, laboratory work, computer program, or other work material in any academic exercise.
   c. Procuring or using tests or examinations, or any other information regarding the content of a test or examination, before the scheduled exercise without prior authorization by the teacher.
   d. Unauthorized communication during any academic exercise.
   e. Discussing the contents of tests or examinations with students who have not yet taken the tests or examinations if the instructor has forbidden such discussion.
   f. Sending a substitute to take one's examination, test, or quiz, or to perform one's field or laboratory work; acting as a substitute for another student at any examination, test, or quiz, or at a field or laboratory work assignment.
   g. Conducting research or preparing work for another student, or allowing others to conduct one's research or prepare one's work, without prior authorization by the teacher.

   Except when otherwise explicitly stated by the teacher, examination questions shall become public after they have been given.
2. ***Fabrication:***
   Inventing or making up data, research results, information, or procedures, such as:
   a. Inventing or making up data, research results, information, or procedures.
   b. Inventing a record of any portion thereof regarding internship, clinical, or practicum experience.
3. ***Falsification:***
   Altering or falsifying information, such as:
   a. Changing grade reports or other academic records.
   b. Altering the record of experimental procedures, data, or results.
   c. Altering the record of or reporting false information about internship, clinical, or practicum experiences.
   d. Forging someone's signature or identification on an academic record.
   e. Altering a returned examination paper in order to claim that the examination was graded erroneously.
   f. Falsely citing a source of information.
4. ***Multiple Submission:***
   The submission of substantial portions of the same academic work, including oral reports, for credit more than once without prior authorization by the teacher involved.
5. ***Plagiarism:***
   Representing the words or ideas of someone else as one's own in any academic exercise, such as:
   a. Submitting as one's own a paper written by another person or by a commercial "ghost writing" service.
   b. Exactly reproducing someone else's words without identifying the words with quotation marks or by appropriate indentation, or without properly citing the quotation in a footnote or reference.
   c. Paraphrasing or summarizing someone else's work without acknowledging the source with a footnote or reference.
   d. Using facts, data, graphs, charts, or other information without acknowledging the source with a footnote or reference.

   Borrowed facts or information obtained in one's research or reading must be acknowledged unless they are "common knowledge". Clear examples of "common knowledge" include the names of leaders of prominent nations, basic scientific laws, and the meaning of fundamental concepts and principles in a discipline. The specific audience for which a paper is written may determine what can be viewed as "common knowledge": for example, the facts commonly known by a group of chemists will differ radically from those known by a more general audience. Students should check with their teachers regarding what can be viewed as "common knowledge" within a specific field or assignment, but often the student will have to make the final judgment. When in doubt, footnotes or references should be used.
6. ***Complicity in Academic Dishonesty:***
   Helping or attempting to commit an academically dishonest act.

The academic units may have additional guidelines regarding academic dishonesty. It is the student's responsibility to check with their teachers and academic units to obtain those guidelines.

Section 6. Discipline Procedures for Academic Dishonesty
Charges of academic dishonesty shall be handled through the appropriate academic unit level procedures.

An academic unit that determines that a student is guilty of academic dishonesty may impose any academic punishment on the student that it sees fit, including suspension or expulsion from the academic unit. A student has no right to appeal the final decision of an academic unit. However, a student who believes that he or she has been treated unfairly, has been discriminated against, or has had his or her rights abridged by the academic unit may file a grievance with the Unit Academic Grievance Committee, pursuant to the provisions of the Student Academic Grievance Procedure; the Unit Academic Grievance Committee may not substitute its judgment on the merits for the judgment of the academic unit.

An academic unit that suspends or expels a student from the academic unit because the student has been found guilty of academic dishonesty may recommend to the University Provost in writing that the student also be suspended or expelled from all other programs and academic units of the University. Within four weeks of receiving such a recommendation, the Provost shall issue a written decision. Neither the student nor the academic unit shall have the right to appeal the Provost's decision. However, a student who believes that he or she has been treated unfairly, has been discriminated against, or has had his or her rights abridged by the issuance of a decision by the Provost may file a grievance with the University Student Grievance Committee, pursuant to the provisions of the Student Academic Grievance Procedure; the University Student Academic Grievance Committee may not substitute its judgment on the merits for the judgment of the Provost.

Section 7. Campus Expression
1. Students have the right of freedom of expression to the extent allowed by law.
2. Students may picket or demonstrate for a cause, subject to the following conditions:
   a. The students must act in an orderly and peaceful manner.
   b. The students must not in any way interfere with the proper functioning of the University.
   c. Where students demonstrate in an area not traditionally used as an open public forum, the University reserves the right to make reasonable restrictions as to time, place, and manner of the student demonstrations.
3. Students may distribute written material on campus without prior approval, providing such distribution does not disrupt the operations of the University or violate University rules.
4. Students may invite to campus and hear on campus speakers of their choice on subjects of their choice; approval will not be withheld by any University official for the purpose of censorship.

Section 8. The Student Press

1. The student press is free to deal openly, fearlessly, and responsibly with issues of interest and importance to the academic community. There shall be no prior approval of student press content by the University.
2. The student press is responsible for adhering to the canons of responsible journalism and for complying with the law. Student publications and broadcasts shall not publish libelous or slanderous matter, or any other content that violates the law.
3. All student publications and broadcasts shall explicitly state that the opinions expressed are not necessarily those of the University or its student body.
4. Students may not be disciplined by the University for their participation with the student press except for violations of University rules that are not inconsistent with the guarantees contained herein.

Section 9. University Facilities

Appropriate University facilities shall be available to organizations within the University community for regular business meetings, for social programs, and for programs open to the public.

1. Reasonable conditions may be imposed to regulate the timeliness of requests, to determine the appropriateness of the space assigned, to regulate time and use, and to insure proper maintenance.
2. Preference may be given to programs designed for audiences consisting primarily of members of the University community.
3. Allocation of space shall be made based on priority of requests and the demonstrated needs of the organization.
4. Charges may be imposed for any unusual costs for use of facilities.
5. Physical abuse of assigned facilities may result in reasonable limitations on future allocation of space to offending parties and will require restitution of damages.
6. The organization requesting space must inform the University of the general purpose of any meeting open to persons other than members and the names of outside speakers.

Section 10. Use of University Name and Insignia

No individual, group, or organization may use the University name or insignia without the express authorization of the University except to identify the University affiliation. University approval or disapproval of any policy or issue may not be stated or implied by any individual, group, or organization.

Section 11. Campus Residence Facilities

Students have the right of privacy in campus residence facilities.

1. Nothing in the University relationship or residence hall contract may expressly or impliedly give the institution or residence hall officials authority to consent to search of a student's room or residence by police or other law enforcement officials unless they have obtained a search warrant.
2. The University reserves the right to enter a student's room in a residence hall or a student's apartment in a campus residence:
   a. in emergencies where imminent danger to life, safety, health, or property is reasonably feared;
   b. to make necessary repairs, improvements, or alterations in the facility;
   c to provide necessary pest control services;
   d. to inspect the facility as deemed necessary by the University.

Section 12. Student Records

The privacy and confidentiality of all student records shall be preserved in accordance with applicable laws. The University shall establish and adhere to a clear and definitive records policy.

Section 13. Campus Organizations

Organizations and groups may be established within the University for any legal purpose. Affiliation with an extramural organization shall not, in itself, disqualify the University branch or chapter from University privileges. A group shall become a formally recognized organization through procedures established by the Student Government Association, upon approval of the Vice President for Student Affairs.

1. Groups of a continuing nature must institute proceedings for formal recognition if they are to receive benefits from the University.
2. Recognition of an organization by the University infers neither approval nor disapproval of the aims, objectives, and policies of the organization, nor liability for the actions of the organization.
3. Membership in all University-related organizations shall be open to any member of the University community who is willing to subscribe to the stated aims and meet the stated obligations of the organization, provided such aims and obligations are lawful.
4. Membership lists are confidential and solely for the use of the organization, except that names and addresses of current organization officers shall be reported to the University as a condition of continuing University recognition.
5. Any organization that engages in activities either on or off campus that are illegal or contrary to any University policy may have sanctions imposed against it, including withdrawal of University recognition.

Section 14. Promulgation of University Rules Affecting Students

Rules and Policies affecting students shall be published in the Student Handbook, in the appropriate University catalogs, or in any other appropriate publication prior to their enforcement. Included in the Student Handbook are the following: Academic Grievance Procedure, Code of Student Conduct, Code of Student Rights and Responsibilities, Policy on Consumption of Alcoholic Beverages for Recognized Student Organizations, Hazing and Initiation Activities Policy, Non-academic Grievance Policy and the Sexual Harassment Policy. Copies of the Student Handbook are available from the Office of Student Life.

Privacy of Student Records

The University of Louisville hereby notifies students concerning the Family Education Rights and Privacy Act of 1974. This Act, with which the institution intends to comply fully, was designed to protect the privacy of educational records, to establish the right of students to inspect and review their education records, and to provide guidelines for the correction of inaccurate or misleading information. Students also have the right to file complaints with the Family Education Rights and Privacy Act Office, Department of Education, concerning alleged failures by the institution to comply with the Act.

The University has adopted a policy which explains in detail the procedures to be used by the University for compliance with the provisions of the Act and the regulations adopted pursuant thereto. Copies of the policy can be obtained from the University Archives and Records Center, Ekstrom Library. Questions concerning the Family Education Rights and Privacy Act may be referred to the Director, University Archives and Records.

Drug-Free Schools and Communities Act Amendments of 1989

On December 12, 1989, President Bush signed into law the Drug-Free Schools and Communities Act Amendments of 1989. These Amendments require that higher education institutions receiving any federal funding must notify each student and employee annually of its program to prevent the illicit use of drugs and the abuse of alcohol by students and employees.

The University of Louisville is committed to creating an environment that assists students in making choices that enhance positive learning and successful transition into adulthood. The misuse and abuse of alcohol and other mood altering chemicals leads to counterproductive behaviors, attitudes and emotions; and, as a result, the total university experience (learning, acculturation, social development) is diminished for both the students who abuse alcohol and other drugs and other students affected by their behavior.

We have several programs in place to combat the misuse of alcohol and other drugs. We realize, however, that only through a concerted effort by all, can any major strides be made in preventing substance abuse.

Drug-Free Schools Notice
As required by the Federal Drug-Free Schools and Communities Act Amendments of 1989, you are hereby notified by the University of Louisville that on University premises or at University-sponsored activities the following acts are prohibited:

1. distribution, possession, or use of any illegal drug or controlled substance without legal authorization;
2. providing alcoholic beverages to individuals under 21 years of age, or possession of alcoholic beverages by individuals under 21 years of age; or
3. illegal possession of an open container of an alcoholic beverage, public intoxication, driving while intoxicated, and drinking alcoholic beverages in an unlicensed public place.

In addition to imposition of disciplinary sanctions under University procedures including suspension or separation from the University for such acts, students or employees may face prosecution and imprisonment under Federal and Kentucky laws which make such acts felony and misdemeanor crimes.

The Code of Student Conduct lists details of offenses and disciplines for students. Staff may be disciplined under Section 11.1 of the Staff Handbook. Faculty may be disciplined by Deans per Redbook Sections 4.5.3 or 3.2.2 with review per 4.4 for sanctions less than dismissal or suspension for one year.

The health risks associated with the misuse and abuse of mind-altering drugs, including controlled substances and alcohol, include but are not limited to: physical and psychological dependence; damage to the brain, pancreas, kidneys and lungs; high blood pressure, heart attacks, and strokes; ulcers; birth defects; a diminished immune system; and, death.

The Counseling Center provides prevention, assessment and referral services to university students.

For further information, call 852-6585. Service for faculty and staff are available through the Faculty/Staff Assistance Program. For further information call 852-6543.

Program Information

Program Information Index

Program Information

Accountancy

Master of Accountancy

Major: ACCY
Degree: MAC
Unit: GB

Faculty

Director
Alan N. Attaway, Associate Professor

Professors
Sidney J. Baxendale
Betty C. Brown, Associate Dean, College of Business and Public Administration
Richard E. Coppage
Alan S. Levitan

Associate Professors
Archie W. Faircloth
Benjamin P. Foster
Julia N. Karcher
Wyatt McDowell
Richard M. Walter

Assistant Professor
William D. Stout

Mission of the School of Accountancy

To meet the needs of our constituents:
- The faculty provides flexible and creative learning experiences to enable our students to succeed in their careers.
- The faculty produces scholarly works to disseminate knowledge to the business and academic communities and to enrich the learning experiences of our students.
- The faculty uses its expertise to serve the community, the university, and the accounting profession.

General Information
The degree program is available to qualified men and women possessing a bachelors degree from an accredited college or university.

No specific undergraduate major is required. An applicant whose curriculum did not include the appropriate course work may be admitted on conditional status while completing the undergraduate prerequisites and later enroll in the Master of Accountancy program.

The Master of Accountancy program is primarily an evening program. A student can enroll as either a part-time or full-time student (9 hours for full-time). During the Fall and Spring semesters, courses are typically offered Monday through Thursday, one evening a week, from 5:30 until 8:15 p.m. During the summer semester, there are two successive five-week sessions and classes meet three evenings a week-- Monday, Tuesday, and Thursday, 5:30-8:15 p.m.

All required courses are offered on a rotating basis in the Fall and Spring semesters, along with a variety of elective courses. A smaller selection of 600-level courses are offered during the two summer sessions. Two-year advance course schedule planners are available to assist students in planning their curriculum and avoiding unforeseen delays in degree completion.

Admission Procedures
Admission into the Master of Accountancy program is competitive. In addition to the requirements described elsewhere in this Catalog for admission to Graduate School, candidates for admission to the Master of Accountancy program must:

1. Submit scores from the Graduate Management Admission Test (GMAT). Designed to measure general aptitude for graduate study in business administration, the GMAT does not test knowledge in specific business subjects. The test should be taken a minimum of two test dates before the semester in which the applicant hopes to enroll. An admission decision will not be made without the GMAT scores.
2. Submit a written personal statement. The statement should demonstrate the applicant's motivation and desire to earn an advanced degree as evidenced by professional achievements, community involvement, etc.

Academic Policies
In addition to the academic policies described elsewhere in this Catalog, the following standards apply to all Master of Accountancy degree candidates:

1. Academic status of part-time students. A part-time student (8 or fewer hours per semester) will be placed on probation for two semesters if the 3.0 grade point average is not maintained. If the part-time student does not restore the grade point average to a 3.0 by the end of the second semester of probation, he/she will be dismissed from the program.
2. An academically dismissed student is required to discontinue course enrollment for a minimum of one semester. After the semester of dismissal, the student may submit a written petition to the Master of Accountancy counselor requesting readmission. Such a request must be submitted at least 40 days prior to the semester in which enrollment is requested. Final approval on readmission must come from the Graduate School.
3. Students are restricted to no more than 3-hours of independent study.

Visiting Students
A student visiting from another university may take the Master of Accountancy course work on a space-available basis. Visiting students must also meet Graduate School requirements stated in the General Section of this catalog.

A U of L Master of Accountancy student who wishes to be a visiting student at another academic institution for a particular semester must obtain permission from the Master of Accountancy counselor. Visiting student status is not allowed to a student who is on academic probation. Only grades of A and B can be transferred back to the University of Louisville and quality points are not transferred. No more than 6 credit hours can be taken from a non-AACSB accredited school.

Curriculum Requirements
The following curriculum requirements apply to all Master of Accountancy degree students:

- Strict compliance with prerequisites is required. Check course descriptions which are listed in this catalog.
- Six hours of graduate courses may be taken in non-business, non-economic areas. Business Education courses are not accepted unless special permission has been given by the Master of Accountancy counselor. NO BUSINESS COURSE MAY BE TAKEN PASS/FAIL.
- All graduate students are expected to make steady and satisfactory progress toward their degrees. Students who fail to maintain enrollment for a period of more than 24 months will be considered to have withdrawn from the program. Students who seek to return after such a period of time (or longer) are required to contact the Master of Accountancy counselor for readmission. Based on the request of the School, the Graduate Dean will consider the student for readmission.

Transfer Credit
A student may be allowed to transfer up to six semester hours of graduate academic credit from another accredited institution(s) that offers advanced degrees. Only courses in which the student earned a grade of "B" or better will be considered for transfer. The hours will be transferred; not the quality points.

Honors
Students who complete the Master of Accountancy program with a grade point average of 3.75 or higher will graduate "With Distinction." Any graduate with a 3.9 standing will also be nominated for the Phi Kappa Phi Honorary Society and the Graduate Dean's Citation.

Degree Requirements
Candidates for the Master of Accountancy degree must:

- Earn a minimum of twenty-four of the thirty graduate credits in residence at the University of Louisville.
- Complete degree course requirements within six years of the semester admitted to the Master of Accountancy degree program.
- Make steady and satisfactory progress towards their degrees. Students who fail to maintain enrollment for a period of more than 24 months will be considered to have withdrawn from the program. Students who seek to return after such a period of time are required to apply to the Student Academic Services office at the College of Business and Public Administration for readmission. Based on the request of the School, the Graduate Dean will consider the student for readmission.

Master of Accountancy Foundation Content
Students must have been exposed to the following topical coverage prior to receiving unconditional admission to the Master of Accountancy program. These provide students with the academic common body of knowledge needed for the Master of Accountancy program.

Content	Equivalent U of L Courses
Taxation Overview of federal taxation, tax terminology, income tax formulas, tax accounting methods, gross income, deductions and losses, significant coverage of property transactions, introduction to tax research, tax problems relating to all aspects of corporate and partnership taxation.	ACCT 315 and ACCT 415
Auditing and Systems Accounting transaction processing cycles, systems development, system documentation, database systems, evaluation of internal control structures, assessment of control risks.	CIS 300 and either ACCT 430 with ACCT 440 or ACCT 310 with ACCT 411
Managerial Cost Accounting Cost accounting concepts and terms, job costing and process costing, activity-based costing, budgeting, variable costing, C-V-P analysis, differential/relevant cost and revenue analysis, standard costing and variance analysis.	ACCT 320
Financial Accounting The range of topics covered in the Intermediate accounting sequences. For some undergraduate programs, this is a two-course sequence; for others it is a three-course sequence.	ACCT 301, ACCT 302, ACCT 303

Master of Accountancy Course Requirements

The Master of Accountancy program consists of 21 graduate hours in accounting courses, 3 graduate hours in commercial law and 6 graduate hours of electives.

	Semester Hours	Total
ACCT 611 Cost & Operations Mgmt	3	
ACCT 631 Federal Taxation	3	
ACCT 615 Not-for-Profit and Governmental Accounting	2	
ACCT 621 Mergers and Consolidations	1	
ACCT 641 Financial Accounting & Professionalism	4	
ACCT 651 Auditing & Systems I	2	
ACCT 652 Auditing & Systems II	6	
CLAW 610 Commercial Law for Professional Accountants	3	
Electives	6	
Total Credit Hours		**30**

Note:

Except for ACCT 652, the prerequisite for all Master of Accountancy courses is admission to the program. ACCT 651 is the prerequisite for ACCT 652.

Electives may be chosen from any 600-level course offered by the CBPA. Electives outside the college may be taken with permission of the Director of the School of Accountancy.

Administration and Higher Education

Faculty

Chair
John L. Strope, Jr., Professor

Professors
Robert E. Hoye, Emeritus
Thomas S. Jeffries, Emeritus
Francis C. Thiemann, Emeritus

Associate Professors
John L. Keedy
Robert R. Schulz, Emeritus
John F. Welsh

Assistant Professor
Paul A. Winter

Programs

Degrees offered by the Department of Administration and Higher Education include the Doctor of Education, Specialist in Education, Master of Education in Educational Leadership, and Master of Arts in Higher Education. Certification as school superintendent, principal, or supervisor of instruction is also available.

Programs are designed to prepare graduates for roles in educational institutions (P-12, post-secondary public or private) or other organizations which value leadership by education-oriented managers. Concentration is on leadership-related concepts and competencies. Mature learners from the fields of education, health services, government, and various other public or private organizations may advance their knowledge of crucial administrative functions and increase their vision regarding organizational potential.

Programs are open to individuals within or outside of professional education.

Certification Program for Instructional Leadership - School Principal (P-12)

Major: EDAD
Concentration: PRNP
Unit: GE

Certification program only. Not a degree program.

These courses do not constitute a degree program, but may be applied to the Ed.S. or the Ed.D. requirements, if the student is admitted to an advanced program. Kentucky law requires completion of at least Level One of a program as a prerequisite to taking mandated tests and then completion of a one-year on-the-job administrative internship.

Admission to the Graduate School and to this Program requires:
1. A masters degree with a grade point average of 2.75 on a 4.0 point system.
2. Two (2) letters of recommendation.
3. Combined GRE scores of at least 800 (Verbal & Quantitative).
4. Approval of Admissions Review Committee.
5. Qualification for a Kentucky classroom teaching certificate.
6. Successful completion of the Kentucky Teacher Internship Program.
7. Successful completion of appropriate tests as required by the Kentucky Department of Education for certification (consult EDAD department).

	Semester Hours	Total
Level I Courses: (Initial Certification)		
EDAD 604, Instructional Leadership and Supervision	3	
EDAD 607, Principles of Educational Leadership	3	
EDAD 608, K-12 Leadership	3	
EDAD 610, Collaboration and Communication for Effective Leadership	3	
EDAD 612, Human Resource Management	3	
EDAD 620, Legal Issues in P-12 Education	3	18
Level II Courses: (First 5-year renewal)		
EDAD 622, Educational Resource Management in P-12 Education	3	
EDAD 720, Advanced Internship in Administration and Supervision	3	
Electives (consult advisor)	6	12
Minimum Total		30

Exit Requirement:
Each student completing the program must complete satisfactorily the state testing program for certification as a principal, an on-the-job internship, and a portfolio. Contact the Administration and Higher Education Department for details.

Certification Program for Supervision of Instruction (Grades P-12)

Major: EDAD
Concentration: SUPV
Unit: GE

Certification program only. Not a degree program.

These courses do not constitute a degree program, but may be applied to the Ed.S. or Ed.D. requirements, if the candidate is admitted to an advanced degree program.

Admission to the Graduate School and to this Program requires:

1. A masters degree with a grade point average of 3.2 on a 4.0 point system.
2. Two (2) letters of recommendation.
3. Combined GRE scores of at least 800 (Verbal & Quantitative).
4. Approval of Admissions Review Committee.
5. A teaching certificate valid for elementary 1-8, early elementary K-4, middle grades 5-8, high school 7-12, high school 9-12, or exceptional children (except speech and communication disorders).
6. At least (3) years of full-time teaching.

	Semester Hours	Total
Level I Courses: (Initial Certification)		
EDAD 603, Administrative Leadership in a Reform Environment	3	
ECPY 540, Evaluation and Measurement in Education	3	
EDEM/EDSD 511, Reading and Writing in Content Areas	3	
EDAD 604, Instructional Leadership and Supervision	3	
EDAD 607, Principles of Educational Leadership	3	
EDAD 608, K-12 Leadership	3	
EDAD 610 Collaboration and Communication for Effective Leadership	3	
EDSP 540, Introduction to Exceptional Children	3	24
Level II Courses: (First 5-year Renewal)		
EDAD 612 Human Resource Management	3	
EDAD 620, Legal Issues in P-12 Education	3	
EDAD 622, Educational Resource Management in P-12 Education	3	
EDAD 720, Advanced Internship in Administration and Supervision	3	
EDAD 740, Seminar in Curriculum	3	15
Minimum Total		39

Certification Program for the School Superintendent

Major: EDAD
Concentration: SPDT
Unit: GE

Certification program only. Not a degree program.
These courses do not constitute a degree program, but may be applied to the Ed.S. or Ed.D. requirements, if the candidate is admitted to an advanced degree program.

Admission to the Graduate School and to this Program requires:

1. A masters degree with a grade point average of 3.2 on a 4.0 point system.
2. Two (2) letters of recommendation.
3. Combined GRE scores of at least 800 (Verbal & Quantitative).
4. Approval of Admissions Review Committee.
5. Qualification for a Kentucky classroom teaching certificate.
6. At least (3) years of full-time teaching experience.
7. Two years of additional experience in an approved school leadership position (see advisor for more information).
8. Completion of both Level I and Level II preparation and certification for principal or supervisor of instruction.

	Semester Hours	Total
Initial Certificate		
(6 hours required, plus EDAD 610 if not previously taken)		
EDAD 610, Collaboration and Communication for Effective Leadership	3	
EDAD 626, Planning	3	
EDAD 720, Advanced Internship in Administration and Supervision (Central office focus)	3	6-9

Program Completion Requirements:

1. A grade-point average of 3.0 on all courses counting on this program.
2. Successful completion of a portfolio. Guidelines are available in the department.

Master of Arts in Higher Education

Major: HED
Degree: MA
Unit: GE

This program is designed for students who wish to qualify for college administrative positions. It does not qualify graduates for Kentucky administrator certification.

	Semester Hours	Total
General Requirements		
EDFD 600 Introduction to Research Methods and Statistics	3	
EDFD 680, The American College and University or EDFD 681, Philosophy of Higher Education	3	6
Professional Area		
EDAD 607, Principles of Educational Leadership	3	
EDAD 626, Planning	3	
EDAD 680, Legal Issues in Postsecondary Education	3	
EDAD 682, Organization and Administration of Higher Educational Institutions	3	
EDAD 684, Educational Resource Management in Postsecondary Education	3	15
Electives (advisor-approved)	6	6
Exit Requirement		
EDAD 690, Internship in Postsecondary Education	6	
or EDAD 699, Thesis or Professional Paper	4	4-6
Minimum Total		**31-33**

Master of Arts in Higher Education With Concentration in Sport Administration

Major: HED
Concentration: SADM
Degree: MA
Unit: GE

	Semester Hours	Total
Professional Area		
EDAD 600, Introduction to Research Methods and Statistics	3	
EDAD 607, Principles of Educational Leadership	3	
EDAD 620, Legal Issues in Education	3	
EDAD 682, Organization and Administration of Higher Educational Institutions	3	
EDFD 680, The American College and University *or* EDFD 681, Philosophy of Higher Education	3	
SPAD 625, Sport Administration	3	18
Specialization Area		
SPAD 505, Sport Facility Management *or* HPES 575, Administration of Physical Education Programs and Athletics	3	
SPAD 618, Rise of the Sport System in America *or* SPAD 680, Athletics and Higher Education	3	
SPAD 684, Current Trends and Issues in Sport Administration *or* other SPAD elective approved by the advisor	3	9
Exit Requirements		
EDAD 699 Thesis or Professional Paper	1-5	
or SPAD 692, Internship in Sport Administration	1-3	4-6
Minimum Total		**31-33**

Specialist in Education in Higher Education

Major: HED
Degree: EDS
Unit: GE

The Specialist in Education (ED.S.) is a sixth-year degree program. Admission requirements for the ED.S. include:

1. An appropriate master's degree.
2. A grade point average of at least 3.3.
3. A combined score of 900 on the Verbal and Quantitative portions of the Graduate Record Examination.
4. Admission to the Graduate School.
5. Successful, relevant professional experience.
6. A written rationale for pursuing the degree.
7. A successful interview with a Departmental Committee.
8. And other selective evidence of academic and professional strengths of the applicant's choice.

A Departmental Committee of at least three faculty members will consider the application and make a recommendation to the Associate Dean about admissions. Potential applicants should confer with the departmental chairperson before filing an application. The Education Specialist degree requires 32 hours of post-masters credit, including the following courses:

	Semester Hours	Total
General Requirements		
1. Historical, philosophical, psychological or social foundations or comparative education	3	
2. Statistics, measurement theory, or symbolic logic	3	6
Specialization		
Courses related to specialization in college administration	12	
EDAD 690, Internship in Postsecondary Education	4	
EDAD 796, Research Literature	4	20
Electives		
Graduate level (500 or above)	6	6
Minimum Total		**32**

Specialist in Education Degree in Educational Administration With Concentrations in Principalship, Superintendent, or Supervision

Major: EDAD
Concentrations: PRNP, SPDT, SPVN
Degree: EDS
Unit: GE

Kentucky law for certification programs and requirements for this degree program do not necessarily coincide. If the student wishes Kentucky administrative certification then the student must incorporate certification requirements into this degree program. Contact the Department of Administration & Higher Education, School of Education, for the most recent information on certification requirements.

The Specialist in Education (ED.S.) is a sixth-year degree program. Admission requirements for the ED.S. include:

1. An appropriate master's degree.
2. A grade point standing of at least 3.3.
3. A combined score of 900 on the Verbal and Quantitative portions of the Graduate Record Examination.
4. Admission to the Graduate School.
5. Successful, relevant professional experience.
6. A written rationale for pursuing the degree.
7. Successful interview with a Departmental Committee.
8. Other selective evidence of academic and professional strengths of the applicant's choice.

A Departmental Committee of at least three faculty members will consider the application and make a recommendation about admission to the Associate Dean. Potential applicants should confer with the departmental chairperson before filing an application.

The Education Specialist degree requires 30 hours of post-master's credit, including the following courses:

	Semester Hours	Total
EDAD 720, Advanced Internship in Administration and Supervision	3	
EDAD 796, Research Literature	3	
EDFD XXX, An approved course in Foundations of Education	3	
EDAD or other approved courses	21	30

Anatomical Sciences and Neurobiology

Faculty

Chairman

Fred J. Roisen, Professor - Trophic factors; nerve-muscle interaction, spinal cord regeneration, neuronal development and neuroplasticity in vitro.

Professors

Kunwar P. Bhatnagar - Pineal gland ultrastructure, organs of special senses, biology of bats; human development, olfactory and acessory olfactory systems; brain development and function.

Ferrell R. Campbell - Ultrastructural studies of hemopoietic tissues.

Nigel G.F. Cooper - Neurobiology of development of sensory systems, somatosensory and visual systems.

Peter M. Fuller - Injury mechanisms, trauma; clinical forensic medicine/anatomy; impact and fracture studies.

James B. Longley, Emeritus - Histochemical aspects of kidney structure and function.

G. Stephen Nettleton - Chemistry of biological stains; histochemistry.

Kenneth H. Reid - Electrophysiology, CNS response to hypoxia, hypoglycemia, and abnormal ionic conditions.

Richard D. Rink - Causes and effects of blunt force injury.

Laura F. Schweitzer - Developmental neurobiology; anatomy of the mammalian auditory and gustatory systems.

Frank J. Swartz, Emeritus - Somatic polyploidization; nuclear differentiation of pancreatic beta cells and hepatocytes.

Richard H. Swigart, Emeritus - Chronic hypoxia with emphasis on the cardiovascular system.

Michael T. Tseng - Photodynamic therapy, experimental chemotherapy; hypoxic and ischemic insults.

Charles E. Wagner, Emeritus - Gross anatomy.

Associate Professors

Rita Colella - Proteinases and their inhibitors: muscle protein degradation, cancer metastasis.

Madhu Gupta - Aging and Parkinson's diseases; neuroanatomical and chemical changes; role of glia and trophic factors.

Kathleen M. Klueber (Director of Graduate Studies) - Muscle biology, neuromuscular relationships in diabetes, spinal cord regeneration.

George D. Mower - Development and plasticity of the visual system; anatomy and physiology; neurotransmitter systems; molecular genetics.

Assistant Professors

Martha E. Bickford - Synaptic circuity of visual thalamus; anatomy and physiology.

Nobuyuki Kuwabara - Cellular and functional organization of the central auditory system.

Guillermo W. Rougier - Comparative anatomy and embryology.

Joint Appointments

Robert B. Aramant - Retina regeneration.

Michael Gruenthal - Neurobiology of epilepsy.

David Magnuson - Identification and characterization of spinal cord interneurons involved in motorneuron activity.

Barbara J. McLaughlin - Ultrastructure, freeze-fracture, and cytochemistry of developing retina; pigment epithelial photoreceptors; corneal wound healing; human corneal dystrophies.

Magdalene Seiler - Retina regeneration.

Associates

Robert Acland, Department of Surgery

John H. Barker, Department of Surgery

Harvey L. Edmonds, Department of Anesthesiology

Allan G. Farman, Department of Maxillofacial Surgery

Vasudeva Iyer, Department of Neurology

John R. Johnson, Department of Orthopedic Surgery

James Jumblatt, Department of Ophthalmology and Visual Sciences

Marcia Jumblatt, Department of Ophthalmology and Visual Sciences

Charles P. McGraw, Department of Neurological Surgery

William N. Olson, Department of Neurology

Michael J. Voor, Department of Orthopedic Surgery

Programs

The Department of Anatomical Sciences and Neurobiology, in the School of Medicine, offers programs of study and investigation leading to the degrees of Master of Science and Doctor of Philosophy. Applicants must satisfy all of the general requirements of the Graduate School. They are expected to have a thorough background in general biology, chemistry, and physics. Students may be accepted with minor deficiencies in these areas when their academic records show superior performance in other subject matter. Applicants should have a baccalaureate degree from an accredited college with a grade average of "B" (3.0) or higher to be considered for admission to unconditional degree status. Applicants are required to take the Graduate Record Examination before they can be considered for admission.

Most major fields of specialization in anatomical sciences and neurobiology are represented by the members of the Department.

An informal atmosphere, moderate size of department, and close contact between staff and students foster the common aims of students and faculty in original research and advanced study.

The following departmental rules, in addition to the general rules of the Graduate School, apply.

Doctor of Philosophy in Anatomical Sciences and Neurobiology

Major: ASNB
Degree: PHD
Unit: GM

Doctoral students are required to take 3 of the 4 courses in the core curriculum (ASNB 601, 603, 605, 615) and 606, Anatomy Seminar. Continuous registration in the seminar course is required throughout the student's time in residence. Additional formal course work is arranged, according to the needs and interests of the individual student, in cooperation with his/her advisor. Students are required to complete six hours of course work outside the department and an additional six credit hours of departmental electives. To prepare adequately for an academic career, each doctoral student is required to assist in two of the three (cannot TA in Embryology) major anatomy courses (601, 603 or 615) and to present a limited number of lectures.

The Department of Anatomical Sciences and Neurobiology does not have a foreign language proficiency requirement. Applicants should recognize, however, that specific areas of intended research may demand such proficiency.

Students are required to complete both a written and an oral examination in order to qualify for candidacy. A research proposal describing the thesis research is also required.

Doctoral students are eligible to apply for traineeships supported by departmental funds and may be nominated for competitive University Fellowships.

Master of Science in Anatomical Sciences and Neurobiology

Major: ASNB
Degree: MS
Unit: GM

Master's applicants are required to take the core curriculum of the department (ASNB 601, 603, 605, 606, 615). Completion of a research project of appropriate scope and the presentation and defense of an acceptable thesis are required for this degree.

Anthropology

Faculty

Chair
Julie Peteet, Associate Professor

Professors
Joseph E. Granger
Edwin S. Segal

Associate Professor
Yvonne V. Jones

The Department of Anthropology offers courses that may be applied toward graduate degrees in other areas. Students must obtain their program advisor's permission before enrolling in these courses. Students who are interested in these courses should contact the Chair of the department.

Audiology

Doctor of Audiology Degree

Major: AUDI
Degree: Au.D.
Unit: GM

Faculty

Professor
David R. Cunningham

Associate Professor
Ian M. Windmill, Director

Assistant Professor
Karen C. Johnson

Adjunct Faculty
William Green, University of Kentucky
George Purvis

Clinical Staff
Tina Boyle
Barbara Eisenmenger, Clinical Coordinator
Sergio Guerriero
Jenny Kloft
Cathy Koetter
Richard Lazich
Margaret Pearson
Sue Windmill

Application Deadline
Except under unusual circumstances, students will be admitted for Fall semester only. Deadline for applications is March 1.

Program

The Doctor of Audiology Degree (Au.D.) is a four-year post bachelor's degree program leading to a professional degree conferred by the School of Medicine. This program has replaced the Master's degree previously offered. The program is physically located within the Louisville Medical Center and the University of Louisville Health Sciences Campus and administratively located in the Division of Communicative Disorders in the Department of Surgery. The faculty are committed to the clinical focus of the Au.D. degree and endeavor to bring real-world experiences to bear on the teaching environment. The faculty and staff of the Audiology Section actively participate in the provision of clinical services in both hospital and private practice arenas.

Students benefit by working side by side with the faculty and staff in an active and dynamic medical environment. Students will be able to interact with faculty, residents and medical students from other disciplines such as otolaryngology, speech pathology and pediatrics, not only in the provision of clinical services, but also in teaching and research endeavors.

Admission to the Doctoral Program
Admission to the program will be for Fall term only, and applications must be received by March 1 of the application year. Criteria for admission to the program includes the following:

a. completed application form;
b. minimum undergraduate grade point average of 3.2 (on a 4.0 scale);
c. appropriate undergraduate preparation (courses in the sciences, mathematics, etc.)
d. minimum score of 1000 on the GRE (verbal and quantitative sections). Note: scores from other tests such as the MCAT may be substituted for the GRE test result.
e. three letters of recommendation; and
f. an interview with the admissions committee.

Applications can be requested through the Audiology Program at (502) 852-5274.

Curriculum
The Doctor of Audiology degree program has been designed to meet the content and experience guidelines developed over the past decade by numerous professional organizations and associations. Curricular content areas and competencies are outlined on the following pages.

The curriculum begins with the student spending a significant amount of time in the classroom with a minimum amount of time in the clinical environment. Over the course of the four years, the ratio of classroom to clinic time reverses, so that the last year consists of virtually full-time clinical experience. During the fourth year, students will be given options for practical experiences in a variety of sites around the country.

Affiliated Hospitals and Clinical Services
Audiology students are exposed to broad-based clinical environments and patient populations during their training. Practicum experiences include the faculty private practice, four hospitals, and affiliated practicum sites located throughout the Louisville area. University Audiology Associates and HearCare Associates are the private practices of the faculty and afford the student an opportunity to learn the business aspects of audiology in addition to provision of a full range of audiologic services. Kosair Children's Hospital is the only comprehensive children's hospital and pediatric trauma center in the state of Kentucky. It functions as the main teaching hospital for the Department of Pediatrics. The faculty manage and staff the audiology services at Kosair Children's Hospital and provide hearing and auditory system evaluations for infants and children, central auditory processing evaluations, and comprehensive audiologic monitoring for children at high risk for hearing loss. The University of Louisville Hospital is the main teaching hospital for the University of Louisville. A variety of audiologic services are performed including audiologic evaluations, follow-up testing for infants failing hearing screenings at birth, evoked potentials and electronystagmography, and worker' compensation evaluations. Located approximately three miles from the Medical Center, the Veteran's Administration Medical Center is a 444-bed facility that recently added a clinical addition that includes new space for the audiology service. Hearing aid dispensing, audiologic evaluations and vestibular evaluations are conducted in the audiology service at the VA. Located in the Medical Center, Jewish Hospital and Frazier Rehabilitation Center provide audiology and vestibular services for both inpatients and outpatients. Vestibular services, in conjunction with physical therapy, include electronystagmography, rotational testing and platform posturography. Frazier Rehabilitation Center has the only vestibular rehabilitation program in the region.

Degree Requirements
Students must successfully pass all required and elective courses with a final GPA of greater than 3.0. Students are expected to maintain a GPA of greater than 3.0 during their course of study. Practical experiences must be successfully completed to graduate. Students whose performance is less than expected may be dismissed from the program.

Biochemistry and Molecular Biology

Faculty

Chair

Russell A. Prough, Professor —Regulation of enzymes involved in foreign compound metabolism; biochemical mechanisms of toxicity and carcinogenesis.

Professors

Mark D. Brennan—Developmental regulation of gene expression; human genetics.

William L. Dean—Structure and function of membrane proteins.

Richard C. Feldhoff—Developmental regulation of complement component C9; purification and characterization of salamander courtship pheromones.

Robert D. Gray—Design and application of metalloproteinase inhibitors in pathological conditions.

Calvin A. Lang—Nutritional and biochemical regulation of gluathione and cyst(e)ine status, detoxification, and the aging process.

Nancy C. Martin—Molecular biology of mitochondrial biogenesis and protein transport; RNA processing.

James L. Wittliff—Characteristics and biological role of steroid and peptide hormone receptors in target tissues; endocrine regulation of gene expression in cancer.

Associate Professors

Jaydev N. Dholakia—Translation control of gene expression during differentiation, development, fertilization, and viral infection.

Steven R. Ellis—Translational regulation of yeast cell growth and differentiation.

Thomas E. Geoghegan—Biochemistry of gene expression in eukaryotes; carcinogenesis and DNA repair.

Thomas J. Wheeler—Membrane transport proteins, focusing on glucose transport in heart and other tissues.

Assistant Professors

Barbara J. Clark—Regulation of steroid hormone biosynthesis by trophic hormones.

Pamela W. Feldhoff—Molecular mechanisms of complement component C9 mediated reactions, utilizing cell culture/cytokines and a hypoxia neonatal rat model.

Ronald Gregg—Function of the subunits of voltage-gated calcium channels in muscle contraction and central nervous systems function using gene targeting in mice.

Carolyn M. Klinge—Estrogen regulation of gene expression.

Joint Professors

Aruni Bhatnagar—(Primary Appointment: Department of Medicine-Cardiology) Reactive oxygen species in cardiovascular disease.

David V. Cohn—(Primary Appointment: Department of Biological & Biophysical Sciences) Biochemistry and physiology of calcium regulating hormones and proteins.

Fred J. Hendler—(Primary Appointment: Department of Medicine-Medicine Oncology) Role of growth factors in cancer; squamous cell neoplastic transformation.

Kenneth R. McLeish—(Primary Appointment: Department of Medicine-Nephrology) Regulation of chemoattractant receptor-G protein interactions; role of mitogen-activated protein kinases in neutrophil function.

Stephen C. Peiper—(Primary Appointment: Department of Pathology) Molecular analysis of chemokine receptors, including their roles as coreceptor for HIV and malaria.

Ch. Venkatesware Rao—(Primary Appointment: Department of Obstetrics and Gynecology) Molecular reproductive biology.

Richard N. Redinger—(Primary Appointment: Department of Medicine-Gastroenterology) Metabolism and secretion of bile acids.

Arno F. Spatola—(Primary Appointment: Department of Chemistry) Peptide chemistry, peptide mimetics and molecular diversity; drug design.

Roland Valdes—(Primary Appointment: Department of Pathology) Endogenous drug-like factors and sodium pump isoforms; pharmacogenetics.

William W. Young—(Primary Appointment: Department of Biological & Biophysical Sciences) Gycolipid metabolism and trafficking.

Joint Associate Professor

Douglas D. Darling—(Primary Appointment: Department of Biological & Biophysical Sciences) Molecular mechanism of action of thyroid/steroid hormone receptors; regulation of gene expression during development.

Sven-Ulrich Gorr—(Primary Appointment: Department of Biological & Biophysical Sciences) Endocrine, neuronal and exocrine cells that store peptide hormones, neuropeptides and digestive proteins at high concentrations in secretory granules.

Joint Assistant Professors

Leighton Grimes—(Primary Appointment: Department of Surgery-Division of Cellular Therapeutics) Molecular imunology and transplantation biology

Walter K. Jones—(Primary Appointment: Department of Medicine-Cardiology) Molecular cardiology and transgenic methods.

Douglas D. Taylor—(Primary Appointment: Department of Obstetrics and Gynecology) Activation of lymphoid cells; role of tumor products in cancer cachexia.

Associates

John Arthur
Douglas C. Borchman
William D. Ehringer
Cicek Gercel-Taylor
Zhenmin Lei
Si-Qi Liu
Douglas Lutz
Joseph M. Steffen

Emeritus/Emerita Professors

John W. Brown
R. Duncan Dallam
Margaret L. Fonda
Mary A. Hilton
Jerald L. Hoffman
Robert S. Levy
Robert L. McGeachin

Adjunct Faculty

Walter M. Mastropaolo
Betty Jane Mills
Holly L. Neibergs

Doctor of Philosophy in Biochemistry

Major: BIOC
Degree: PHD
Unit: GM

Programs

The Department of Biochemistry and Molecular Biology in the School of Medicine offers programs of study and investigation leading to the award of Master of Science and Doctor of Philosophy degrees.

Admission
Applicants must have attained the B.A. or B.S. degree with a "B" (3.0 on a 4-point scale) average in all course work. The minimum science requirements include chemistry through one semester of physical chemistry, one year of biological sciences, mathematics through integral calculus, and one year of physics. A limited number of deficiencies may be removed during the first year of graduate study. The results of the Graduate Record Examination, a transcript of course work, and two letters of recommendation are required. Prospective students also should arrange for a personal interview with members of the department.

Thesis and Dissertation Committees
The Director of the Graduate Executive Committee in Biochemistry will serve as the first-year advisor to each incoming graduate student until a research program is selected. After completion of laboratory rotations, a student will select a major professor with the approval of the Graduate Executive Committee. At the same time a Dissertation or Thesis Committee will be formulated, subject to approval by the Dean of the Graduate School, which will serve as the Reading Committee and Examining Committee. This Committee will ordinarily convene at least once a year.

Financial Support
Financial support for graduate study is currently being provided by the Alfred and Iva Homberger Memorial Fund of the Department of Biochemistry and Molecular Biology, by University doctoral fellowships and by department teaching and research assistantships.

Requirements for the Ph.D. Degree in Biochemistry

1. Students entering the Ph.D. program must have taken two (2) semesters of organic chemistry and earned a B or better both semesters and one (1) semester of physical chemistry and earned a C or better. Students receiving a C (or lower) in one semester of organic chemistry have the option of taking and passing the ACS exam in organic chemistry with a minimum of the 40th percentile or taking a remedial undergraduate course or appropriate graduate course in the area of deficiency and earning a B or better.
2. Students who have not satisfied the requirement in physical chemistry must take Physical Chemistry I their first year and must earn a C or better.
3. Course work will consist of BIOC 603, 605, 611, 612, 613, 645, 647, 650, 668, and 681. Electives 602, 640, 641, 660, 667, and 675 are also available.
4. Attendance at seminars and research conferences is required.
5. BIOC 606 (Seminar) is required on an annual basis each year of residence for a total of three seminars. Grades are received for the first two semesters.
6. All Ph.D. students are required to assist in teaching for one semester during their 2nd or 3rd years.
7. There is no foreign language requirement. At least one 2-hour outside elective such as statistics is required and must be approved by the Dissertation Committee.
8. Students are expected to maintain a 3.0 average in their course work. Students who do not will be subject to dismissal from the program.
9. Written Proposal and Oral Examination. A written proposal on a topic different from the student's dissertation research will be given in May/June to students who have completed the core courses and attained a 3.0 or better GPA. The purpose of this exam is to evaluate the student's knowledge of biochemistry and ability to interpret literature and integrate material from the graduate curriculum into a clearly written research proposal.
10. Preliminary Research Proposal. By the end of the third quarter of the second year the student will provide his/her Ph.D. Committee with a short, informal write-up of research proposed for the Ph.D. dissertation. The student will meet with the Ph.D. Committee to give an oral presentation and discuss the proposed research.
11. Written Proposal and Oral Examination. A formal written proposal of the student's dissertation work and an oral defense that must be completed by December of the student's third year. The proposal will not exceed one (1) page for specific aims, two (2) pages for background (significance), three (3) pages of preliminary results, three (3) pages for proposed experimental plans including major equipment required. The student is responsible for the literature work and specific experimental design. Committee members must be provided with the proposal two (2) weeks prior to the date of the oral examination. The written proposal should be approved by each Committee member one (1) week prior to the oral examination. At the Oral Examination, the student will present a formal research conference open to everyone. This will be followed by an oral defense before the student's committee, chaired by the dissertation advisor. A written report stating the outcome of the examination and signed by each examiner will become a part of the student's record. A copy of representative proposals will be on file in the Biochemistry and Molecular Biology Department Office.

Dissertation
Students, with the consent of their committee, may choose between a traditional research thesis/dissertation format or a thesis/dissertation in which the methods and results sections are replaced by manuscripts ready for submission for publication in a refereed journal. In either case, the dissertation must conform to the Graduate School's Standards for Preparation of Theses and Dissertations.

Master of Science in Biochemistry

Major: BIOC
Degree: MS
Unit: GM

Requirements for the M.S. Degree in Biochemistry

1. M.S. students must have taken one semester of physical chemistry prior to enrollment or take one semester of physical chemistry during their first year of graduate training, and receive a minimum grade of C.
2. M.S. students must have received a grade of at least B in 2 semesters of organic chemistry, or must take the ACS organic chemistry diagnostic examination and receive a minimum score at the 40th percentile. The student also may retake undergraduate organic chemistry or an appropriate graduate course and must receive a grade of B or better.
3. Course work will consist of BIOC 611, 612, 613, 645, and 647. In addition, the M.S. student must take two of the following courses: BIOC 605, 650, 668, and 681.
4. One semester of BIOC 606 (Seminar) is required during the second year.
5. Students are required to attend seminars and research conferences.
6. Students are expected to maintain a 3.0 average in their course work. Students who do not will be subject to dismissal from the program.
7. There are no foreign language requirements for the M.S. degree in Biochemistry.
8. Students must present a 1-2 page research proposal for their thesis committee and orally defend that proposal.

Thesis
See dissertation description above.

Biology

Faculty

Chair
Ronald D. Fell, Professor

Professors
Ronald M. Atlas
Gary A. Cobbs
Charles V. Covell, Jr.
William D. Pearson
R. Jan Stevenson

Associate Professors
Arnold J. Karpoff
Michael H. Perlin
Joseph M. Steffen

Assistant Professors
Paul A. Bukaveckas
Lee Alan Dugatkin
Perri Kaye Eason
Jeffrey D. Jack
Martin G. Klotz
Ashima Sen Gupta

Emeritus Professors
William S. Davis
Roger G. Lambert
Frederick H. Whittaker
Varley E. Wiedeman

Programs

The Department of Biology, in the College of Arts and Sciences, offers work leading to the degrees of Master of Science in Biology and Doctor of Philosophy in Environmental Biology. Programs generally include a broad base of fundamentals in biology, and each student has the opportunity for direction by specialists in aquatic ecology, behavioral ecology, cellular biology, ecology, entomology, genetics, ichthyology, insect development, invertebrate ecology, microbiology, molecular biology, ornithology, plant physiology, plant anatomy, systematics and evolution of plants and animals, and vertebrate physiology.

Because of the widening divergence of specialities and the development of new areas of biological and related sciences, the Biology department will assist those students who wish to include interdisciplinary objectives in their Masters or Ph.D. program.

To be admitted as a graduate major for an advanced degree in biology, the applicant must meet the requirements for admission to the Graduate School, must present an acceptable undergraduate major (as outlined in the catalog of the College of Arts and Sciences of the University of Louisville) or its equivalent in the biological sciences, and must have taken the aptitude section of the Graduate Record Examination. A "Graduate Student Regimen," explaining in detail the requirements for the several degrees, is available from the Director of Graduate Studies of the Department of Biology.

Applications for admission and additional information may be requested from the Office of Admissions or the Director of Graduate Studies of the Department of Biology. The general requirements for the master's and doctoral degrees are stated in the General Requirement sections in the General Information section of this catalog. There is no formal language requirement for graduate students seeking the degree of Master of Science or Doctor of Philosophy.

Cooperative Ph.D. programs are sponsored jointly by the Department of Biology at Murray State University or Western Kentucky University and the University of Louisville. Inquiries concerning the program should be addressed to chair of the Department of Biology either at the University of Louisville, at Murray State University (Murray, Kentucky 42071), or at Western Kentucky University (Bowling Green, Kentucky 42101). All applications for these cooperative programs should be obtained from the University of Louisville.

Doctor of Philosophy in Environmental Biology

Major: EBIO
Degree: PhD
Unit: GA

The following requirements are those for the degree of Doctor of Philosophy in Environmental Biology.

Foundations in Environmental Biology (600 level)
One course to be selected by student's committee from each of five categories*

	Semester Hours	Total
Environmental Physiology	4	
Molecular Approaches in Environmental Biology	4	
Evolution or Systematic		
Population, Community, or Ecosystem Ecology	4	16

Other Courses

Statistics	4
Advanced Environmental Courses (600-700 level)	20
Dissertation Research (700 level)	9
Minimum Total**	**49**

Note:
A dissertation proposal suitable for submission to an extramural funding source shall also be prepared by the student by or before his/her Ph.D. oral exam.

* If it is determined that the student has an adequate background in a particular area, additional elective selections may be made from other categories. Any student enrolled in the Ph.D. program must take these courses at the 600 level.

** Post-baccalaureate education, including courses in master's program.

Master of Science in Biology

Major: BIOL
Degree: MS
Unit: GA

The following requirements are those for the degree of Master of Science in biology, designed to provide a general background and to allow a student through selection of elective courses, to emphasize biological fields such as aquatic ecology, behavioral ecology, cellular biology, ecology, entomology, genetics, ichthyology, insect development, invertebrate ecology, microbiology, molecular biology, ornithology, plant physiology, plant anatomy, systematics and evolution of plants and animals, and vertebrate physiology.

General Background Courses (500 or 600 level)
One course to be selected by student's committee from each of two of the following categories

	Semester Hours	Total
Environmental Physiology	3-4	
Molecular Approaches in Environmental Biology	3-4	
Evolution or Systematics	3-4	
Population, Community, or Ecosystem Ecology	3-4	12-16

Courses in Area of Emphasis (500 or 600m level)

Selection to be made by student's committee in accordance with area of emphasis	11

Other courses

Statistics	3-4
Thesis Research (600 level)	6
Dissertation Research (700 level)	9
Other Research or Electives	1-4
Minimum Total	**30**

Note:
A minimum of 12 semesters hours, exclusive of thesis credit, must be in courses at the 600 level. Students intending to seek a Ph.D. degree later are advised to take as many of their courses as possible at the 600 level or above.

Business Administration

Faculty

Professors
Arthur J. Adams
Sidney J. Baxendale
Jeffrey S. Bracker
Betty C. Brown, Associate Dean
Richard E. Coppage
Kathleen Drummond, Emerita
Stephen F. Gohmann
Hazel J. Johnson
Frank E. Kuzmits
Raymond W. LaForge
Alan Levitan
Subash C. Lonial
Peter B. Meyer
John P. Nelson
J. Russ Ray
Harold V. Savitch
S. Srinivasan
Lyle Sussman
Robert L. Taylor, Dean, College of Business & Public Administration
Randall L. Wells

Associate Professors
Jay T. Brandi
Reginald A. Bruce
Nan-Ting Chou
Van G. H. Clouse
Paul A. Coomes
Carrie G. Donald
Archie W. Faircloth
John I. Gilderbloom
Mahesh C. Gupta
Terence M. Hancock
Denise M. Johnson
Bruce H. Kemelgor
Thomas S. Lyons
James R. McCabe
Robert C. Myers
P. S. Raju
Frederick W. Siegel
John Vahaly, Jr.

Assistant Professor
Audrey Davidson

General Information

The mission of the University of Louisville College of Business and Public Administration (CBPA) is to develop the minds and imaginations of our students, faculty, and metropolitan community through innovative learning and scholarship that provide understanding and skills for the global entrepreneurial marketplace of the 21st century.

The University of Louisville's MBA program is accredited by the American Assembly of Collegiate Schools of Business (AACSB), the national accrediting body for schools of business administration. The degree program is available to qualified men and women possessing a bachelors degree from an accredited college or university.

No specific undergraduate major is required. An applicant whose undergraduate curriculum did not include the appropriate course work may be admitted on conditional status while completing the Foundation Core and later enroll in the MBA Core Curriculum.

Applicants who have earned academic credits equivalent to the content of the Foundation Core and who successfully pass the placement tests will need 36 hours of MBA Core courses in order to fulfill the degree requirements.

The MBA program is primarily an evening program in which an individual can enroll as either a part-time or full-time student. During the Fall and Spring semesters, courses are typically offered Monday through Thursday, one evening a week, from 5:30 until 8:15 p.m. During the summer semester, there are two successive six week sessions and classes meet three evenings a week, Monday, Tuesday and Thursday.

All required 600-level courses are offered in the Fall and Spring semesters, along with a variety of elective courses. A smaller selection of 600-level courses is offered during the two summer sessions. The 500-level course offerings are split between the Fall and Spring semesters and are not part of the summer course schedule. Two-year advanced course schedule planners are available to assist students in planning their curriculum and avoiding unforeseen delays in degree completion.

Admission Procedures
Admission into the MBA program is competitive. Entering MBA candidates at the University of Louisville are in the top third of all entering MBA candidates nationwide. The procedures for admission into the U of L MBA program are as follows:

- submit a completed graduate application to the University of Louisville Admissions Office. There is a $25 application fee. Program candidates are admitted in the Fall semester (which begins in late August), and in the Spring semester (which begins in mid-January). The application deadline (and submission of all application materials) for both of these terms is 120 days prior to the beginning of the semester. Program candidates are also admitted the summer semester, which begins in mid-May. Submission of all application materials for the Summer semester is 80 days prior to the beginning of the semester.
- official transcripts verifying the receipt of a baccalaureate degree from an accredited institution must be submitted to the Admissions Office prior to the application deadline.
- the Graduate Management Admissions Test (GMAT) is required. Designed to measure general aptitude for graduate study in business administration, it does not test knowledge in specific business subjects. The test must be taken a minimum of two test dates before the semester in which the applicant hopes to enroll. An admission decision will not be made without the GMAT results.
- a written personal statement is highly recommended for the applicant who has either a marginal GMAT score, undergraduate grade point average, or both. The statement should demonstrate the applicant's motivation and desire to earn an advanced degree as evidenced by professional achievements, community involvement, etc.
- two letters of recommendation need to be from individuals familiar with the applicant's academic performance. Professional letters from employers are acceptable when substantial time has elapsed since the applicant has attended an academic institution.

- international applicants are required to take the TOEFL examination if English is not the native language. Applicants who have not scored 550 or higher on the TOEFL may choose to apply to the intensive English as a Second Language Program. Successful completion of this program or passing the Exit Examination in the advanced level of IESL will be considered adequate proof of the English proficiency required for course work in the MBA program. Acceptance to the Intensive English Program does not constitute acceptance to the MBA program. For information and application forms, write to IESL, University of Louisville, Louisville, KY, 40292, U.S.A.

Academic Policies
The following standards apply to all MBA degree candidates:

- Grades of "A", "B", or "C" are the only grades to be considered as passing. However, a "D" or an "F" will be used in calculating the grade point average.
- A maximum of six hours in 600-level courses with a grade of "C" may count toward the completion of degree requirements.
- After admission into the program, a 3.0 grade point average must be maintained in the Foundations Core and a 3.0 grade point average must be maintained in the 36 hour MBA Core. In each area, the grade point average is calculated separately. These calculations exclude transfer work. If a 3.0 GPA is not maintained, the student will be placed on probation. Continuation in the program will be dependent upon the student's subsequent performance and evaluation by the designated school academic officer.
- Students are restricted to no more than one independent study from any single faculty member throughout the degree program. It is possible to earn only 3 credit hours of independent study per semester.
- For a full-time student (9 or more hours per semester), a 3.0 grade point average must be maintained or the student will be placed on probation. If the student does not restore the grade point average to a 3.0 by the end of the next semester of enrollment, the student will be dismissed from the program. For a part-time student (8 or less hours per semester), if the 3.0 grade point average is not maintained, the student will be placed on probation for two semesters. If the part-time student does not restore the grade point average to a 3.0 by the end of the second semester of probation, the student will be dismissed from the program.
- An academically dismissed student is required to discontinue course enrollment for a minimum of one semester. After the semester of dismissal, the student may submit a written petition to the MBA Counselor requesting readmission. Such a request must be submitted at least 40 days prior to the semester in which enrollment is requested.
- a student who has received a grade of "C", "D", or "F" may repeat the course upon approval of the Graduate Dean and the MBA Counselor. When a student repeats a course, the grade point average will be calculated on the basis of the last grade attempted, although all previous grades will remain on the transcript.
- a faculty member teaching a graduate-level course (i.e. either 500- or 600-level) may assign a grade with either a plus (e.g., B+) or a minus (e.g., B-). See section on Academic Policies and Requirements (Grading System).

Visiting Students
A student visiting from another university may take MBA course work on a space-available basis. Visiting students must also meet Graduate School requirements stated in the General Section of this catalog.

A U of L MBA student who wishes to be a visiting student at another academic institution for a particular semester must obtain permission from the MBA Counselor. Visiting student status is not allowed to a student who is on academic probation. Only grades of A and B can be transferred back to the University of Louisville and quality points are not transferred. No more than 6 credit hours can be taken from a non-accredited AACSB school.

Quantitative Skills Requirements
MBA candidates are expected to be academically proficient in quantitative skills. This includes both mathematics and statistics. The MBA Counselor is responsible for reviewing the student's transcripts.

The quantitative skills requirement may be demonstrated either on admission or gained after admission. Students may on admission demonstrate proficiency by prior academic work which meets or exceeds the following minimal requirements in level and credit hours:

- **Mathematics:** Three or more semester credit hours of prior undergraduate course work in mathematics at least at the level of MATH 111, College Algebra, passed with a grade of at least a C,
- **Statistics:** Three or more semester credit hours of undergraduate course work in statistics passed with a grade of at least a C.

Students not demonstrating proficiency on admission must attain it during their MBA program. They may do so in the following way:

- **Mathematics:** Either completing MATH 111, College Algebra, with a grade of B or better or passing a proficiency exam in college algebra.
- **Statistics:** Either completing MGMT 501, Managerial Statistics, with a grade of B or better or passing a proficiency exam in business statistics.

Computer Skills Requirement:
- Computer literacy: Upon review and approval, the student who has completed formalized course work utilizing "hands on" experience may be waived from this requirement. If equivalent "hands on" knowledge has been achieved through work experience, then the student should submit a written statement requesting a waiver for the computer requirements. Such a letter should be submitted to the MBA Counselor. For the student who is not academically prepared, CIS 500, Computer Concepts for Managers, should be taken.

Curriculum Requirements
The following curriculum requirements apply to all MBA degree students.

Students must complete the prerequisite courses before enrolling in any 500 and/or 600 course. Failure to do so will result in disenrollment from the program.

- Students who do not have the undergraduate course equivalents for a particular 500-level course must complete the 500-level course before enrolling in the respective 600-level course. A 500-level course cannot be used as an elective.
- Students should take Accounting 600 and Management 600 as early as possible in their program.

Master of Business Administration

Major: BA
Degree: MBA
Unit: GB

- Strict compliance with prerequisites is required. Check course descriptions which are listed in this Catalog.
- Undergraduate accounting majors must take a 600-level accounting or finance elective instead of ACCT 600. Undergraduate finance majors may petition the chairman of the Finance department to take a 600-level finance elective instead of FIN 600. Undergraduate marketing majors may take a marketing elective to replace the Marketing 600. Undergraduate Management majors may take a management elective to replace the Management 600.
- For students seeking to establish an MBA concentration, the twelve hours of electives are specified. Concentrations currently available: Healthcare Administration, Communications, and Entreprenuership.
- For students not seeking to establish an MBA concentration, no more than six of the twelve hours of electives may be taken in any one discipline (marketing, management, etc.).
- Six hours of graduate courses may be taken in non-business, non-economic areas. Three hours of the non-business, non-economic course work may be taken on a pass/fail basis. Business Education courses are not accepted unless special permission has been given by the MBA counselor. NO BUSINESS COURSE MAY BE TAKEN PASS/FAIL.
- All graduate students are expected to make steady and satisfactory progress toward their degrees. Students who fail to maintain enrollment for a period of more than 24 months will be considered to have withdrawn from the program. Students who seek to return after such a period of time (or longer) are required to contact the MBA Counselor for readmission. Based on the request of the School, the Graduate Dean will consider the student for readmission.

Transfer Credit
A student may be allowed to transfer up to six semester hours of graduate academic credit from another accredited institution(s) that offers advanced degrees. An additional six semester hours of graduate credit may be transferred from AACSB accredited business school provided the student earns 24 semester hours of residency at the University of Louisville. Only courses in which the student earned a grade of "B" or better will be considered for transfer. The hours will be transferred; not the quality points.

A transfer of credits is possible only after earning six semester hours in the University of Louisville College of Business and Public Administration. Students wishing to transfer credit should make a request to the MBA Counselor. Final approval for transfer of credit must come from the Office of Research & Graduate Programs.

Honors
Students who complete the M.B.A. Core program with a grade-point average of 3.75 or higher will be graduated "With Distinction." Any graduate with a 3.9 standing will also be nominated for the Phi Kappa Phi Honorary Society and the Graduate Dean's Citation.

Degree Requirements

Candidates for the M.B.A. degree must:

- Earn a minimum of twenty-four of the thirty-six hours of graduate credit in residence at the University of Louisville.
- Complete degree course requirements within six years of the semester admitted to the MBA degree program (Foundation Core and/or MBA Core.)
- Make steady and satisfactory progress toward their degrees. Students who fail to maintain enrollment for a period of more than 24 months will be considered to have withdrawn from the program. Students who seek to return after such a period of time are required to apply to the Advising Center at the College of Business and Public Administration for readmission. Based on the request of the School, the Graduate Dean will consider the student for readmission.

Foundation Core
The undergraduate and 500-level courses provide students with the academic common body of knowledge for the MBA Core requirements (600-level). An applicant who has not taken any of the Foundation Core can be admitted to the program. Only an applicant who has been admitted to the MBA program is eligible to enroll in a 500-level course.

Upon admission to the MBA program, the student must take the following Foundation Core course(s) unless the course equivalents were taken in the student's undergraduate curriculum, a minimum grade of C was earned, and the MBA Counselor has waived the course requirement.

	Semester Hours
Acct 500, Fundamentals of Accounting	
or 6 hours of Principles of Accounting I & II	1.5
CIS 500, Computer Concepts and Application for Managers	
or ISDP 155 and CIS 300	1.5
ECON 500, Economics	
or 6 hours of Micro and Macro Economics	3
FIN 500, Business Finance	
or 3 hours of Corporate Finance	1.5
MGMT 501, Managerial Statistics	
or 3 hours of Statistics (placement test)	3
MKT 500, Marketing Concepts	
or 3 hours of Principles of Marketing	1.5

Additional courses in Mathematics and Computers may be required depending upon the student's academic transcripts and proficiency. Please refer to the section on "Quantitative Skills Requirements."

Master of Business Administration and Juris Doctorate

Majors: BA and LAW
Degrees: MBA and JD
Units: GB and LA

Master of Business Administration Core

The MBA Core is required of all students. If a course has been taken by the student at another academic institution, the student must initiate a request for a course waiver with the MBA Counselor. Strict compliance with prerequisites is required.

Courses	Semester Hours	Prerequisites
Acct 600, Managerial Accounting	3	ACCT 500 or equivalent
CIS 675, Management Information Systems	3	CIS 500 or equivalent
ECON 600, Managerial Economics	3	ECON 500, CIS 500, and elementary calculus or equivalents
FIN 600, Financial Management	3	FIN 500 or equivalent
MGMT 600, Advanced Organizational Behavior	3	None
MGMT 610, Operations Management Systems and Technology	3	MGMT 501 or equivalent
MGMT 690, Strategic Management	3	Must be taken in the final semester
MKT 600, Marketing Management	3	MKT 500 or equivalent
Electives	12	
Total	**36**	

Approved Concentrations/Electives
MBA students normally take twelve hours of elective courses distributed across several areas of business, with a maximum of six hours in any one area of study. However, students do have the option of pursuing an MBA with a concentration in Heathcare Administration, Communications, or Entrepreneurship. Courses taken to complete one of these concentrations fulfills the twelve hours of electives.

MBA/JD Program
The MBA/JD program is offered jointly by the College of Business and Public Administration and the School of Law. The purpose of the program is to combine the two-year Master of Business Administration (MBA) program and the three-year Juris Doctor (JD) program into one four-year, full-time program. Upon successful completion of the program, the student is awarded both the MBA and the JD degrees.

This program is open to all students who have successfully completed a baccalaureate degree at an accredited college or university. To be admitted into the program, the student is required to apply to and be accepted by both the College of Business and Public Administration and the School of Law. Such a procedure requires the student to meet the admission requirements of both schools.

Students seeking admission into this program need to submit a letter to the admissions office of the school in which they first intend to take courses, or in which they are currently taking courses, and forward a copy of such letter to the admissions office of the other school. Applicants will receive written notification regarding whether their admission request is approved or disapproved.

Candidates in the joint MBA/JD program must accumulate 27 directed hours in the MBA curriculum (in lieu of the normal 36 hours) and 81 directed hours in the JD curriculum (in lieu of the normal 90 hours). Nine hours from each program can be counted as electives in the other program to give the student the requisite hours for both the MBA and the JD degrees.

While enrolled in the College of Business and Public Administration, the MBA/JD students are subject to all academic policies and procedures that MBA students are expected to follow.

Integrative MBA Program
The integrative MBA program departs from the traditional three-credit hour, fifteen week format and uses an integrative, interactive approach that more closely resembles the natural business environment. Students apply the fundamentals of group dynamics when they participate as team members and will gain hands-on experience with the practical application of information technology. Courses are offered as modules and are frequently team-taught by faculty across disciplines.

Each student is required to have access to a personal computer seven days a week, 24 hours a day. Students communicate via e-mail with team members, faculty, and establish links with team members at other universities, nationally and internationally. Although this program offers some exciting alternatives to the traditional MBA program, it significantly reduces flexibility available in scheduling classes and completing requirements. Each class of students go through the module sequency together.

There are two additional application credentials required: a current resume and a one page written personal statement outlining reasons for being selected for participation in the accelerated program.

Prospective students interested in more information on this program should contact the Advising Center, College of Business and Public Administration, 852-7439.

MEng/MBA Program
The College of Business and Public Administration in conjunction with the Speed Scientific School offers a program where a student may simultaneously work toward a Master of Engineering degree and Master of Business Administration degree. Speed School students interested in declaring this degree may seek admission to the MBA program in their junior year. Admitted students may begin taking the MBA foundations courses as early as the summer after their junior year. Upon completion of the MEng, students may count up to twelve hours of graduate Speed courses toward the thirty-six-hour MBA Core. Students in the MEng/MBA also have the option of seeking a concentration in entrepreneurship. For more information, contact the MEeng/MBA program coordinator.

Overseas Program
The College of Business and Public Administration offers its MBA degree at selected overseas sites. At present these sites include Hong Kong, Athens, and Singapore. University of Louisville faculty travel to these locations to present the courses for the programs. The overseas programs are designed to serve students residing outside the U.S. The programs have separate admission and registration processes, different time schedules and tuition rates, and are fixed-length, lock-step programs which do not allow electives. For information on the overseas programs, contact the faculty coordinator or the particular program of interest.

Chemical Engineering

Faculty

Chair
Dermot J. Collins, Professor

Professors
Pradeep B. Deshpande
Marvin Fleischman, Emeritus
Earl R. Gerhard, Dean Emeritus, Speed Scientific School
Thomas R. Hanley, Dean, Speed Scientific School
Dean O. Harper, Graduate Student Advisor
Walden L. S. Laukhuf
Raul Miranda
Charles A. Plank, Emeritus
Patricia A. Ralston
Hugh T. Spencer, Emeritus
James C. Watters
Gordon C. Williams, Emeritus

Assistant Professor
Mahendra Sunkara

Associates
Lawrence Gettleman
Elias Klein
Richard A. Ward

Programs

The Department of Chemical Engineering of the Speed Scientific School, the school of engineering and applied science of the University of Louisville, offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy. It also offers an integrated five-year program of cooperative education leading to the professional degree of Master of Engineering (described in the University's Undergraduate Catalog).

Admission Requirements
The admission requirements for the M.S. program are essentially the same as those of the Graduate School. For unconditional admission a minimum score of 1100 (Verbal & Quantitative) on the GRE and a minimum 3.0 on a 4.0 scale is expected. Remedial work may be specified for those applicants who, in the opinion of the faculty, do not have a sufficient background in chemical engineering, e.g., B.S. chemists, biologists (approximately one year of undergraduate courses may be required.)

Doctor of Philosophy Program

Major: CHE
Degree: PHD
Unit: GS

The general requirements of the Doctor of Philosophy program are the same as those of the Graduate School. Other specific guidelines for the Ph.D. degree in chemical engineering are these:*

	Semester Hours	Total
Minimum course hours beyond baccalaureate degree in Chemical Engineering	30	
Seminar	6	
Research	36	
Minimum Total		**72**

* (includes course, research and thesis hours for M.S. or M.Eng.).

Master of Science in Chemical Engineering

Major: CHE
Degree: MS
Unit: GS

The general requirements of the Master of Science program are the same as those of the Graduate School. Other, specific requirements for the M.S. degree in chemical engineering are these:

	Semester Hours	Total
CHE 610, Advanced Thermodynamics	3	
CHE 620, Transport Phenomena	3	
CHE 641, Advanced Reactor Design	3	
CHE 686, Chemical Engineering Analysis	3	12
CHE 695, Chemical Engineering Seminar	3	3
Other 500-600 level courses (at least one course outside chemical engineering)	9	9
CHE 690, M.S. Thesis in Chemical Engineering	6	6
Minimum Total		**30**

Chemistry

Faculty

Chair
George R. Pack, Professor

Professors
Richard P. Baldwin
John W. Brown, Emeritus
Robert M. Buchanan
Thomas H. Crawford, Emeritus
Donald B. DuPre
Dorothy H. Gibson
N. Thornton Lipscomb, Emeritus
Mark E. Noble
Gradus L. Shoemaker, Emeritus
Arno F. Spatola
K. Grant Taylor
Charles A. Trapp
Donald E. Williams , Emeritus
Richard J. Wittebort
John L. Wong

Associate Professors
Peter W. Faguy
Frederick Luzzio
John F. Richardson
M. Cecilia Yappert

Assistant Professor
Muriel C. Maurer

Programs

The Department of Chemistry, in the College of Arts and Sciences, offers graduate programs leading to the M.S. and Ph.D. degrees in chemistry with options in analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, physical chemistry, and chemical physics.

The general requirements for admission to the Graduate School, for admission to candidacy, and for the master's and doctoral degrees are stated in the General Information section of this catalog. The following additional provisions apply to the programs leading to the Master of Science in chemistry and Doctor of Philosophy in chemistry.

Admission
Students seeking a graduate degree in chemistry should meet the following requirements:

1. An B.A. or B.S. degree in chemistry or in a related field such as physics, engineering, or mathematics. It is expected that students will have obtained a background in chemistry equivalent to 36 hours of undergraduate coursework. Students planning to pursue graduate study work in chemical physics may substitute some of the chemistry hours with advanced courses in physics or mathematics beyond those required for a B.A. or B.S. in chemistry. Students with inadequate preparation will be required to register for specific courses in the area of deficiency. Some of these courses, subject to approval by the department, may be accepted for graduate credit. Admission to graduate study in chemical physics is made on the recommendation of the entrance committee for that option.
2. A minimum quality point standing of 3.0/4.0.
3. Submission of Graduate Record Examination scores (totaling at least 1,200 on two of the three sections of the General Test).

In individual cases, the conditional admission of a student who does not satisfactorily meet the above requirements may be recommended by the department to the Graduate School. If admission is granted, that student will be subject to those conditions specified by the department or Graduate School as being necessary to remedy the conditional admission.

Doctor of Philosophy in Chemistry

Major: CHEM
Degree: PhD
Unit: GA

The requirements for the Doctor of Philosophy degree in chemistry are as follows:

1. The general requirements as stated in the General Information section of this catalog.
2. Completion of a core course curriculum to assure breadth of knowledge. This requirement is satisfied by the completion of courses prescribed as a result of placement exams and completion of advanced courses selected from at least four of the following six areas:

   Analytical Chemistry (CHEM 620, 621, 622, or 625)

   Biochemistry (CHEM 645 or 647)

   Inorganic Chemistry (CHEM 653 or 654)

   Organic Chemistry (CHEM 678 or 679)

   Physical Chemistry (CHEM 561 or PHYS 621), (CHEM 672 or PHYS 622 or CHEM 683).

   Physics (PHYS 605 or 611)

   Ph.D students will complete two additional advanced courses in the optional area selected for thesis work.
3. Students with a native language other than English must show a proficiency in English. This requirement may be met with a grade of 'B' in Eng. 101 (or equivalent) or an acceptable score on a standardized test (such as the "Michigan test").
4. Satisfactory performance on an original research proposal and a written comprehensive examination based upon in-depth knowledge of the applicant's area(s) of specialization. The written comprehensive exam demands a mastery of fundamentals, course work, and recent literature. Successful completion of the written exam is required within two years of entering the doctoral program.
5. Acceptable presentation of two seminars, one a literature seminar on a topic of current chemical interest, and the other a research seminar on the student's thesis project.

Master of Science in Chemistry

Major: CHEM
Degree: MS
Unit: GA

Degree Requirements

The general requirements for Master of Science degree in chemistry are those given in the General Information section of this catalog.

At the beginning of the semester during which a student expects to fulfill the requirements for a degree, an application for that degree must be presented to the graduate dean. Departmental approval of the student's admission to candidacy is shown on the degree application. Approval will not be granted unless all of the general and departmental requirements for candidacy have been met.

The requirements for the Master of Science degree in chemistry are as follows:

1. The general requirements as stated in the General Information section of this catalog.
2. Completion of a core course curriculum as described in the section on Candidacy for the Ph.D. degree.
3. Students with a native language other than English must show a proficiency in English. This requirement may be met with a grade of 'B' in Eng. 101 (or equivalent) or an acceptable score on a standardized test (such as the "Michigan test").
4. Acceptable presentation of a one-hour literature seminar on a topic of current chemical interest.

Civil and Environmental Engineering

Faculty

Chair
Louis F. Cohn, Professor

Professors
N. R. Bhaskar
Michael A. Cassaro
D. Joseph Hagerty
R. A. Harris
C. Eugene Miller, Emeritus
Jafar P. Mohsen
Arthur C. Parola
Mario M. Paz
Charles R. Ullrich

Associate Professors
Thomas E. Fenske
Mark French
Terence Alan Weigel

Adjunct Professor
Hans Gesund

Programs

The Department of Civil and Environmental Engineering of the Speed Scientific School, the school of engineering and applied science of the University of Louisville, offers a program of study leading to the degree of Master of Science. It also offers an integrated five-year program of cooperative education leading to the professional degree of Master of Engineering (described in the University's Undergraduate Catalog). In addition, the Department offers a Doctor of Philosophy in Civil Engineering under a joint program with the University of Kentucky.

Admission Requirements
The admission requirements for the M.S. program are essentially the same as the general requirements of the Graduate School. Remedial work may be specified for those applicants who, in the opinion of the faculty, do not have a sufficient background in civil engineering.

Doctor of Philosophy in Civil Engineering

Major: CE
Degree: PHD
Unit: GS

The requirements for this degree are flexible, but normally require at least two years' full-time study beyond the Master's degree. One of those years must be devoted to the preparation of a dissertation which significantly advances knowledge in the field.

Students in this program must be admitted by the Graduate Schools of both the University of Louisville and the University of Kentucky, and must spend one semester at the University of Kentucky prior to the qualifying examination.

Master of Science in Civil Engineering

Major: CE
Degree: MS
Unit: GS

Master of Science Program

The general requirements of the Master of Science Program are the same as those of the Graduate School. Other, specific requirements for the M.S. degree in civil engineering are these:

	Semester Hours	Total
Civil Engineering Courses (at least 9 hours at the 600 level)	12	
Other 500-600 level courses (at least two courses outside civil engineering)	12	
Thesis for M.S.	6	
Minimum Total		**30**

A minimum of 12 hours must be at the 600-level, exclusive of thesis hours.

Classical and Modern Languages

Master of Arts in French, German, or Spanish

Major: FREN, GERM, SPAN
Degree: MA
Unit: GA

Faculty

Chair
Wendy E. Pfeffer, Professor

Professors
Roy L. Ackerman
Howard B. Altman
Rhonda Buchanan
William L. Cunningham
Fortuna Gordon, Emerita
David R. Hershberg, Emeritus
Alan C. Leidner
Frank Nuessel
Hubert Papailler, Emeritus
Hans Petersen, Emeritus
Marilyn V. Schuler, Emerita
Sydney P. Schultze

Associate Professors
Anne Greenfeld
David R. Hume, Emeritus
Manuel Medina

Assistant Professor
Mary Makris

Programs

The Department of Classical and Modern Languages, in the College of Arts and Sciences, offers programs leading to the degree of Master of Arts in French, German, Spanish and Foreign Language Education. For all programs the applicant must meet the general requirements of the Graduate School outlined in the General Information section.

Prerequisite for all courses in the department offered at the graduate level is the ability to read, comprehend, speak, and write the language. In addition, it is strongly recommended that the applicant have some knowledge of a second European language.

Courses at the 500 level are open both to advanced undergraduate and to graduate students, while courses in the 600 series are open only to graduate students.

Students should consult the departmental advisors concerning pending changes in curricula and course offerings.

Candidates for the M.A. degree in French or Spanish must take at least 33 hours at the graduate level, at least 18 of which, exclusive of thesis hours, if any, must be in courses open to graduate students only, i.e., courses at the 600 level. Candidates for the M.A. degree in German must take at least 30 hours at the graduate level, at least 15 of which, exclusive of thesis hours, if any, must be in courses open to graduate students only. Six of the hours may be fulfilled by the writing of a thesis, in the language in which the candidate is most fluent.

With the approval of the director of graduate studies, candidates may take 6 hours of electives within the Humanities Division, in courses at the 500 or 600 level. All candidates must satisfactorily complete ML 601 during their first year of graduate study.

Communication

Faculty

Chair
Charles A. Willard, Professor

Associate Professors
John P. Ferré
Allan Futrell
Joy Hart
Greg Leichty

Programs

The Department of Communication offers courses that may be applied toward graduate degrees in other areas. Students must obtain their program advisor's permission before enrolling in these courses.

Both the M.A. in sociology and the Master of Business Administration programs offer formal concentrations in communication. For more information, contact Dr. Charles Willard, Chair of the department of communication, or your program advisor in sociology or business administration.

Students pursuing a communication concentration as part of their M.A. in sociology must take 12 hours chosen from among the following courses. Nine hours must be at the 600-level.

COMM 520, Computer Mediated Communication (3)
COMM 590, Health Communication (3)
COMM 600, Practicum (1-3)
COMM 610, Problems of Public Discourse (3)
COMM 620, Organizational Communication (3)
COMM 630, Communication and Multiculturalism (3)
COMM 640, Communication in Social Service (3)

Students pursuing a communication concentration as part of the M.B.A. must take 12 hours chosen from among the following courses:

COMM 650, Corporate Communication (3)
COMM 651, Conflict Management (3)
COMM 652, Computer-Mediated Communication in Organizations (3)
COMM 654, Public Relations & Crisis Management (3)
COMM 690, Special Topics (3)

Communicative Disorders

Faculty

Division Director
David R. Cunningham, Ph.D., Professor

Director of Speech Language Pathology
Barbara M. Baker, Ph.D., Professor

Director of Audiology
Ian M. Windmill, Ph.D., Associate Professor

Program:

For speech language pathology majors, the Graduate School offers the Master of Science degree in communicative disorders. The School of Medicine offers the Doctor of Audiology degree for Audiology majors. Both programs are administered through the Division of Communicative disorders, Department of Surgery, School of medicine. Separate application and acceptance is required for admission to each degree program. Students who wish to pursue a dual major or transfer from one section to the other must submit separate applications. Acceptance into one program does not guarantee admission to the other program.

The program leading to a Master of Science degree for Speech Pathology majors is a full time five-semester sequence beginning each year in the fall semester. The program leading to the Doctor of Audiology degree is a full-time, four-year degree program. The final year of the program may be spent at an external location.

The Council on Academic Accreditation (CAA) of the American Speech Language Hearing Association (ASHA) accredits the Speech Language Pathology program and the Audiology Program. Graduating students will be eligible to apply for the Certificate of Clinical Competence by ASHA if all requirements are fulfilled. Students may also be eligible for Kentucky State teaching certification in speech language pathology. The Teacher Certification Program by which speech pathology students prepare for school therapy positions is certified by the National Council for Accreditation for Teacher Education. Additional coursework may be required to be eligible for ASHA or teaching certification.

The program operates its own teaching clinics, including the WHAS Crusade for Children Audiology and Speech Pathology Center, the University of Louisville Hospital, faculty practice locations, and Kosair Children's Hospital. In addition the program has cooperative arrangements with more than thirty schools, agencies, hospitals, and practice groups in the Kentuckiana region.

Admission Requirements
Speech Pathology: Applicants should have a cumulative undergraduate grade point average of at least 3.0 on a 4.0 scale and combined Verbal and Quantitative scores on the Graduate Record Examination of at least 900. At least three letters of recommendation should accompany the application. A formal interview may be required. The applicant should read and meet the general requirements for admission to the Graduate School.

Audiology: Applicants should have a cumulative undergraduate grade point average of at least 3.2 on a 4.0 scale and combined Verbal and Quantitative scores on the Graduate Record Examination of at least 1000. Three letters of recommendation should accompany the application and a formal interview is required.

Degree Requirements

Candidates for the Master of Science degree in speech pathology must complete at least 52 credit hours at the graduate level, exclusive of credits related to the completion of a (optional) master's thesis, courses required to complete ASHA certification requirements, and/or course work related to Kentucky State Teacher Certification. Candidates for the Doctor of Audiology degree must complete the prescribed curriculum and experiences as outlined in the program of study. Courses necessary to complete ASHA certification requirements are in addition to the prescribed curriculum.

Pass/Fail Option
In general, students in Speech pathology or Audiology may not choose the pass/fail option. Certain courses may be offered with this option at the discretion of the faculty.

Comprehensive Examinations
Students in Speech Language Pathology will take an eight-hour written comprehensive examination followed by a one and one-half hour oral comprehensive examination during their last semester of study. The completion of a master's thesis is encouraged, but is optional. Thesis students will take at least one statistics course above the introductory level. Thesis students will take a comprehensive oral examination that will focus primarily, but not exclusively, on the thesis work itself. These examinations must be completed at least five weeks prior to the completion of the student's graduate program. The student is responsible for becoming familiar with the consequences of failure on the written or oral examinations. This information is available at the program office.

Clinical Practicum

The American Speech Language Hearing Association requires a minimum of 375 clock hours of supervised clinical practicum in speech pathology or audiology to be eligible for certification. Twenty clock hours must be in the student's minor area and two hundred sixty clock hours must be at the graduate level. (Ten of the 260 hours are graduate observation and 250 are clinical clock hours.) In Audiology, students will earn between 2500 and 3000 experiential hours over the four years of the program. The student may spend the final year of the program at clinical site outside the Louisville area. Certain prerequisites and standards apply to clinical practicum component of the program, including minimum course work requirements, mandatory readings, observations, case report formats, and grading criteria. This information is available in the program office and it is the student's responsibility to become acquainted with these requirements prior to enrolling in clinical practicum.

Falling below a 3.0 average in practicum for two consecutive semesters will result in dismissal from the program. Practicum assignments are made at the faculty's discretion and with the service needs of the clinic in mind. All practicum work done outside of the main program must be given prior approval by the section director.

For more detailed information regarding the Graduate Program in Communicative Disorders, please write: Program Chair, Graduate Program in Communicative Disorders, Myers Hall, University of Louisville, Louisville, Kentucky 40292 or telephone (502) 852-5284.

Computer Science and Engineering

Program Faculty

Coordinator
Peter B. Aronhime, Professor (EE)

Professors
Samuel V. Bell (EE, Emeritus)
Kiron C. Bordoloi (EE)
Darrel L. Chenoweth (EE/EMACS)
Thomas G. Cleaver (EE)
Robert W. Cohn (EE)
Joseph D. Cole (EE)
Adel S. Elmaghraby (EMACS)
James H. Graham (EE/EMACS)
J. Carroll Hill (EE)
Thomas L. Holloman (EMACS)
Barry R. Horowitz (EE)
Khaled A. Kamel (EMACS)
Melvin J. Maron (EMACS)
Carol A. O'Connor-Holloman (EMACS)
William H. Pierce (EE, Emeritus)
Rammohan K. Ragade (EMACS)
Patricia A. S. Ralston (EMACS)
Arthur M. Riehl (EMACS)
Donald J. Scheer (EE)
Jacek M. Zurada (EE)

Associate Professors
Dar-jen Chang (EMACS)
Hollace L. Cox (EE)
Ahmed H. Desoky (EMACS)
Aly A. Farag (EE)
Anup Kumar (EMACS)
John H. Lilly (EE)
Gwong-Chain Sun (EMACS)
Kevin M. Walsh (EE)

Admission

Typically, students who apply to the Ph.D. program will have completed a master's degree. Applicants whose score on the Verbal and Quantitative sections of the Graduate Record Examination General Test is 1200, who have a master's degree in Computer Engineering, Computer Science and Engineering, Electrical Engineering, or Engineering Mathematics and Computer Science from an accredited program, and whose grade point average is at least 3.25/4.0 may be granted unconditional admission.

Applicants with master's degrees in other branches of engineering, computer science, chemistry, physics, or mathematics may be admitted conditionally and may be required to complete up to 30 hours of undergraduate courses before being admitted to degree status. Applicants with degrees in fields other than those enumerated in this paragraph will be directed to enroll as postbaccalaureate students and complete up to 30 hours in computer hardware and software courses and may be required to complete up to 24 hours of mathematics courses in order to provide a background adequate for admission to the Ph.D. program.

After the completion of 9 hours of postbaccalaureate courses, a student is reviewed by the program faculty to assess the student's capacity for doctoral-level work and to assist in developing an appropriate course of study. The review is based on an evaluation of the performance of the student in courses taken for credit in the CSE program. Upon recommendation of the program faculty, a student who fails this review may repeat it at the next offering; however, the review may not be taken more than twice.

Computer Science and Engineering provides a broad base in both hardware and software and in the application of computer concepts to other disciplines. The core curriculum covers essential mathematics, provides a background in computer software and hardware, and includes an introduction to computationally intensive applications.

The Ph.D. program in Computer Science and Engineering is jointly offered through the Department of Electrical Engineering and the Engineering Mathematics & Computer Science Department. Students interested in applying for the program should contact Ms. Lisa Bell, Computer Science and Engineering Program Secretary (W.S. Speed Hall, Rm 200 E; llbell02@homer.louisville.edu).

Doctor of Philosophy in Computer Science and Engineering

Major: CSE
Degree: PHD
Unit: GS

Program

Doctoral students must complete at least two courses (6 hours) in each of two core areas and must complete one course in each of the remaining two core areas. They must complete a sufficient number of additional approved electives to ensure a depth of preparation in the field of Computer Science and Engineering. The four core areas are: Computer Software Engineering, Computer Hardware Engineering, Computationally Intensive Applications, and Advanced Mathematics. Each student must also complete 3 hours of Seminar (CSE 695), but no more than 3 hours of CSE 695 may be credited toward the degree.

Computer Software Engineering core courses include: CSE 504, 530, 545, 550, 608, 619, 630.

Computer Hardware Engineering core courses include: CSE 510, 515, 611, 632, and EE 516/EMCS 525.

Computationally Intensive Applications core courses include: EE 520, 545, 550, 560, 614, 620, 650, 661, 662, 670; EMCS 522, 542, 622, 628; EE 618/EMCS 627, EE 619/EMCS 633.

Advanced Mathematics core courses include: EMCS 508, 563, 615, 617, 663; MATH 501, 581, 660, 662, 681, and EMCS 511/MATH 511.

A student must consult with the dissertation advisor before registering for courses. A minimum of 72 semester hours of postbaccalaureate credit (including up to 24 semester hours for the dissertation), plus 3 hours of CSE Seminar (CSE 695) are required for the degree.

Upon the completion of the formal course work required for the Ph.D., a student must pass a written preliminary examination for admission to candidacy. The student shall prepare a formal plan of study for review by the dissertation committee soon after the formulation of the committee. This plan must be approved by the CSE Coordinator.

Each student is also required to prepare a written dissertation proposal and present it to the dissertation committee for approval. The dissertation proposal should be a sufficiently complete statement of the proposed research so that the committee can judge the originality, significance and likely success of the research. It should contain a detailed review of the previous contributions of others in the proposed area, with supporting reference citations. It should contain a clear statement of the proposed contributions, emphasizing the facets that will make this work unique, and it should include enough supporting detail and preliminary results so that an assessment of likelihood of success can be made. Appearance, format and citations should be in conformance with the requirements of the Graduate School.

After the committee has approved the dissertation proposal, the committee shall prepare a written examination pertaining to the proposal as well as background areas. This examination is called the preliminary examination. Upon successful completion of this examination, the student is admitted to Candidacy Status by the Graduate School.

Early and Middle Childhood Education

Faculty

Chair
Diane W. Kyle, Professor

Professors
Jewell B. Brownstein, Emerita
Victoria Molfese
Stanley I. Mour, Emeritus
Bernard J. Strenecky
Charles S. Thompson

Associate Professors
Jean Anne Clyde
Mark W.F. Condon
Karen S. Karp
Karen K. Lind
Ellen McIntyre
Gina D. Schack
J. Lea Smith

Assistant Professors
Phyllis Metcalf-Turner
Patricia A. Walker, Emerita

Programs

The Department of Early and Middle Childhood Education offers the Master of Arts in Teaching (MAT) Degree leading to certification of P-5 and 5-9 teachers and the Master of Education Degree leading to certification in Interdisciplinary Early Childhood Education. For certified teachers, the Department offers the Master of Education Degree in Elementary and Middle Grades Education and non-degree Rank II and Rank I programs, all with optional emphases in such areas as early childhood, literacy, mathematics, social studies, science, and gifted education. Students interested in a degree program beyond the Master's may also pursue the Specialist in Education Degree within the Department.

Masters of Arts in Teaching in Early Elementary Education (certification in grades P-5)

Major: ERED
Degree: MAT
Unit: GE

Admission Requirements
1. Admission to Graduate School
2. Admission to Teacher Education
3. Admission to the Professional Year Program (P-5)
4. Completion of Pre-Teacher Education Core and Academic Teaching Specialty

	Semester Hours	Total
Professional Education Courses		
EDEM 672, Elementary: Orientation and General Methods	3	
EDEM 673, Teaching Methods in Grades K-4	9-9	
EDEM 674, Seminars	3-3	
EDEM 675, Elementary: Case Studies	3	
Exit Requirement		
EDEM 676, Field Experience/Student Teaching	3-3	
Minimum Total		**36**

Masters of Arts in Teaching in Middle Grades (certification in grades 5-9)

Major: MSED
Degree: MAT
Unit: GE

Admission Requirements

1. Admission to Graduate School
2. Admission to Teacher Education
3. Admission to the Professional Year Program (5-9)
4. Completion of the Pre-Teacher Education Core and two middle grades majors

	Semester Hours	Total
Professional Education Courses		
EDEM 689 Middle Grades: Orientation and General Methods	3	
EDEM 690, Teaching in the Middle Grades	9-9	
EDEM 691, Seminars	3-3	
EDEM 692, Case Studies	3	
EDEM 693, Field Experience and Student Teaching	3-3	

Exit Requirement

EDEM 690 includes a student teaching experience that constitutes the exit requirement

Minimum Total 36

Master of Education in Reading Education (with endorsement in Reading and Writing)

Major: RE
Degree: MED
Unit: GE

	Semester Hours	Total
Required Core		
EDFD 600, Introduction to Research Methods and Statistics (must be taken within the first 9 hours)	3	
EDFD 6_, One course in the philosophical, historical, *or* sociological foundations to be selected from: EDFD 620, 625, 629, 630, 640, 681	3	
EDEM 602, Elementary School Curriculum *or* EDEM 607, Middle Grades Curriculum (must be taken within the first 6 hours	3	
EDEM 610, Literacy Research and Theory	3	12
Required Literacy		
EDEM 615, Evaluation and Measurement in Literacy	3	
EDEM/EDSD 613/614, Remediation in Literacy I/II *or* EDEM/EDSD 616, Advanced Clinical Procedures in Literacy	3	
EDEM 642, Literacy, Learning, and Cultural Differences	3	
EDEM 618, Practicum in Literacy (exit requirement)	3	12

Literacy Focus (select 6 hours)

EDEM/EDSD 511, Reading and Writing in the Content Area
EDEM 643, Emergent Literacy: Development and Instruction
EDEM 644, The Authoring Cycle
EDEM 617, Supervision of Literacy Programs
EDEM 648, Literacy-Based Curriculum
EDEM 640, Language Arts in the Elementary School
EDEM 645, Advanced Studies in Children's Literature
EDEM 649, Using Literacies and Tools to Learn: Inquiry in the Classroom
EDEM 694, Special Topics in Literacy
EDEM 710, Advanced Research in literacy
EDEM 540, Teaching Adolescent Readers
EDSD 617, Louisville Writing Project 6

Minimum Total 30

Master of Education
in Early Elementary Education (P-5)

Major: ERED
Degree: MED
Unit: GE

	Semester Hours	Total
Required Professional Courses		
EDFD 600, Introduction to Research Methods and Statistics (must be taken within the first nine hours)	3	
The student will choose, with the approval of his/her advisor, a course in the philosophical, historical, or sociological foundations to be selected from among the following:		
EDFD 620, 625, 629, 630, 640, 681	3	
EDEM 602, Elementary School Curriculum (must be taken within the first six hours)	3	
EDEM 610, Literacy Research and Theory	3	12
Strand		
In consultation with the graduate advisor, a minimum of 12 semester hours of graduate courses that provide further depth and breadth of preparation in an area of choice must be selected	12	
Electives		
In consultation with the graduate advisor, 6 hours of graduate courses must be selected. It is strongly recommended that students who have not had previous courses in exceptionality and cultural diversity choose electives in these areas.	6	
Exit Requirement		
A 3.0 or above grade-point average, successful completion of all program requirements, and successful completion of the capstone experience.	3	
Minimum Total		**30**

Notes:
A. Minimum of 18 hours in 600-level courses is required.
B. Maximum of 2 workshops allowed in total program.
C. Final acceptance of transfer credit (a maximum of 6 hours) is dependent upon receipt of transcript.
D. Official program must be approved by advisor and filed with the School of Education Advising Center at the beginning of the program.
E. A maximum of 6 hours taken in non-degree status can be applied toward a master's degree, upon approval of advisor.
F. All courses must be completed within 6 years.

Master of Education
in Middle School
Education (5-9)

Major: MSED
Degree: MED
Unit: GE

	Semester Hours	Total
Required Professional Courses		
EDFD 600, Introduction to Research Methods and Statistics (must be taken within the first nine hours)	3	
The student will choose, with the approval of his/her advisor, a course in the philosophical, historical, or sociological foundations to be selected from among the following:		
EDFD 620, 625, 629, 630, 640, 681	3	
EDEM 609, Advanced Middle Grades Curriculum (take within the first six hours)	3	
EDEM 610, Literacy Research and Theory *or* EDEM 540, Teaching Adolescent Readers *or* EDEM 511, Reading & Writing in Content Areas	3	12
Strand		
In consultation with the graduate advisor, the student must select a minimum of 12 semester hours of graduate courses that provide further depth and breadth of preparation in an area of choice.	12	
Electives		
In consultation with the graduate advisor, 6 hours of graduate courses must be selected. It is strongly recommended that students who have not had previous courses in exceptionality and cultural diversity choose electives in these areas.	6	
Exit Requirement		
A 3.0 or above grade-point average, successful completion of all program requirements, and successful completion of the capstone experience.		
Minimum Total		**30**

Notes:
A. Minimum of 18 hours in 600-level courses is required.
B. Maximum of 2 workshops allowed in total program.
C. Final acceptance of transfer credit (a maximum of 6 hours) is dependent upon receipt of transcript.
D. Official program must be approved by advisor and filed with the School of Education Advising Center at the beginning of the program.
E. A maximum of 6 hours taken in non-degree status can be applied toward a master's degree, upon approval of advisor.
F. All courses must be completed within 6 years.

Master of Education in Early Childhood Education

Major: ECE
Degree: MED
Unit: GE

This program is designed for students who hold at least a baccalaureate degree in any academic area and who are interested in receiving birth to primary teacher certification in Kentucky. The program includes a minimum of 39 hours of course work. However, some students admitted to the program may not have general teacher competencies and will need to take the Pre-Teacher Education Core. Due to the differing backgrounds of the students who enter the program, completion of the Self-Assessment to determine areas of strength and need will be required upon admission. Specific information regarding the Self-Assessment to determine areas of strength and need will be required upon admission.

Admission Requirements

1. Baccalaureate degree from an accredited college
2. Admission to Graduate School
3. EDUC 501: Pre-Teacher Education Core I
4. EDUC 502: Pre-Teacher Education Core II
5. EDUC 503: Pre-Teacher Education Core III: Elementary School
6. Self-Assessment completed

	Semester Hours	Total
Graduate Core		
EDFD 600, Introduction to Research Methods and Statistics (required only for the MED)	3	
EDFD 630, The School in the American Social Order	3	
EDUC 629, Interdisciplinary Seminar in Early Childhood Education	3	
EDEM 627, Applied Child Development	3	
EDEM 635, Administration and Consultation: Day Care and Early Childhood Education (Field-Based)	3	
EDSP 683, Early Childhood/Special Education Screening	3	
EDSP 684, Early Family Intervention for Preschool Children with Disabilities	3	
EDSP 686, Programs and Services for Preschool Children with Disabilities	3	
EDSP 687, Practicum/Action Research (Exit Requirement)	6	30
Curriculum (Select 2 courses)		
EDEM 505, Infant/Toddler Development and Care	3	
EDEM 632, Curriculum Problems in Early Childhood Education	3	
EDEM 633, Curriculum and Methods for Early Childhood Special Education	3	
EDEM 643, Emergent Literacy	3	6
Development (Select 2 courses)		
EDSP 536, Language Development and Language Disorders	3	
CMDS 652, Childhood Language Disorders	3	
HPES 618, Adapted Physical Activity	3	
HPES 565, Nutrition for Children and Adolescents	3	
EDEM 636, Theories of Play	3	
EDEM 630, Theories of Child Development	3	6
Minimum Total		**42**

Note:
The Rank II Equivalency Program may only be pursued by those who currently hold teacher certification in another area. Professional development may be substituted in lieu of up to twelve (12) semester hours of college credit at the request of the candidate as part of the Rank II Equivalency Program.

Specialist in Education in Elementary Education

Majors: ELED
Degree: EDS
Unit: GE

The Ed.S. is a 30-hour degree program beyond the master's degree. Selective admission standards restrict this program to the superior graduate student in education.

Admission Requirements

1. An appropriate master's degree with a grade point standing of at least 3.3.
2. A combined score of 900 on the Verbal and Quantitative portions of the Graduate Record Examination.
3. Successful, relevant professional experience.
4. A written rationale for pursuing the degree.
5. A successful interview with a Departmental Committee.
6. Other selected evidence of academic and professional strengths of the applicant's choice.

Complete applications for admission must be submitted by March 15th or October 15th. A Departmental Committee of at least three faculty members will consider the applications and make recommendations about admissions to the Associate Dean by the end of the semester. Potential applicants should confer with the departmental chair before filing an application.

	Semester Hours	Total
Common Core Requirements		
One course in the philosophical, historical, or sociological foundations to be selected from EDFD 620, 625, 630, 640, or 681	3	
Advanced course in research	3	6
Area of Specialization	18	
Electives	3	
Professional Paper	3-6	
Minimum Total		**30**

Educational and Counseling Psychology

Faculty

Chair
Daya S. Sandhu, Professor

Professors
Rea T. Alsup, Emeritus
George K. Cunningham
Nancy J. Cunningham
John M. Dillard
William F. Kelly, Emeritus
Eleanor Y. Love, Emerita
Pedro R. Portes
Gerald B. Sklare

Associate Professors
Michael J. Cuyjet
Patrick H. Hardesty
Kathleen M. Kirby

Assistant Professors
Steven J. Morris

Program

Degrees offered by the Department of Educational and Counseling Psychology include the Doctor of Education, the Specialist in Education, and the Master of Education.

The Doctor of Education degree prepares advanced students for leadership roles in school counseling, college student personnel, and counseling psychology. A focus is placed on special issues associated with working in urban settings.

The doctoral concentration in counseling psychology is based on the philosophy that theory, research, and practice are interdependent and complementary dimensions of professional education in a scientist/practitioner model leading to the practice of professional psychology. The curriculum of this program is designed to ensure competence in all three dimensions and includes coursework in four broad areas: 1) urban studies; 2) counseling psychology; 3) electives in counseling and psychotherapy; and 4) research. Students are expected to demonstrate competencies in foundational areas of psychology, supervision psychological theory, practice, and research through a series of comprehensive examinations and to demonstrate competency in practice through the successful completion of an approved 2,000-hour internship.

The Master of Education degree in Counseling and Personnel Services offers optional concentrations in elementary or secondary school counseling, counseling psychology and student personnel services. Students can pursue further study in any of the Master's level specializations by entering the Specialist degree program.

Non-degree graduate programs are also available for certified teachers pursuing Rank I or Rank II.

Departmental Admission and Retention Policy

For all programs in counseling and student personnel work, the student should exhibit those personal qualities and characteristics which, in the judgment of the faculty, are necessary for effective functioning in the role of a counselor, psychologist, or student personnel worker. The faculty may require interviews in addition to written credentials as part of the admission process.

At any point after admission, the faculty reserves the right to review a student's fitness, on the basis of personal characteristics, for continuing in the counseling and student personnel program. Such an assessment shall be initiated upon the recommendation of two faculty members and shall consist of a review of the student's academic record, other pertinent evidence, and an interview with the student by the department faculty.

This review must result in a recommendation to the Dean for (1) continuation of a student in the program, (2) continuation for a specified professional period with specific conditions for continuation thereafter, or (3) dismissal from the program. Some courses may require learning experiences which focus on self-understanding or growth.

Master of Education in Counseling and Personnel Services with concentration in Elementary School Guidance
Major: CPS
Concentration: ELCT
Degree: MED
Unit: GE

Fulfills the National Board for Certified Counselors (NBCC) educational requirements to sit for the exam for National Counselor certification.

Rank II and Elementary School Counseling Certification Requirements (33 hours)

	Semester Hours	Total
Graduate Core		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDFD 625, History of American Education *or* EDFD 629, History of Educational Thought *or* EDFD 630, School in the American Social Order *or* EDFD 640, Developing a Philosophy of Education	3	6
Professional Courses		
ECPY 600, Introduction to Counseling and Psychotherapy	3	
ECPY 540, Evaluation and Measurement in Education	3	
ECPY 625, Elementary School Counseling	3	
ECPY 651, Group Procedures with Children	3	
ECPY 663, Multicultural Counseling	3	
ECPY 730, Social, Legal, Ethical Issues in Counseling	3	18

Additional Professional Courses (Three courses from the following will complete a Rank II): The remaining two courses not taken for the Rank II must be completed for the master's degree.

ECPY 512, Learning and Cognition in Education	3	
ECPY 605, Human Development	3	
ECPY 626, Consulting with Parents and Teachers	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 671, Psychology of Career Development	3	15

Upon satisfactory completion of the above coursework, students may apply for a Rank II. Satisfactory completion of the coursework below will fulfill the requirements for a M.ED. (48 hours) and provisional certificate for elementary school counseling. These credits also count toward a Rank I and Standard Counseling Certificate. 33

* Up to 12 hours of Professional Development units may be counted toward a Rank II program.

Master of Education in Elementary School Counseling Requirements (The M.ED. includes all courses listed in the Rank II program above and 15 additional hours listed below.)

ECPY 628, Theories and Techniques of Counseling Children	3	
ECPY 680, Counseling Practicum	3	
ECPY 680, Counseling Practicum	3	
Two of courses not completed in the above Section		
ECPY ___	3	
ECPY ___	3	15
Minimum Total		**48**

Master of Education in Counseling and Personnel Services with concentration in Secondary School Guidance
Major: CPS
Concentration: SECT
Degree: MED
Unit: GE

Fulfills the National Board for Certified Counselors (NBCC) educational requirements to sit for the exam for National Counselor certification.

Rank II and Secondary School Counseling Certification Requirements (33 hours)

	Semester Hours	Total
Graduate Core		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDFD 625, History of American Education *or* EDFD 629, History of Educational Thought *or* EDFD 630, School in the American Social Order *or* EDFD 640, Developing a Philosophy of Education	3	6
Area of Concentration		
ECPY 600, Introduction to Counseling and Psychotherapy	3	
ECPY 540, Evaluation and Measurement in Education	3	
ECPY 624, Organization and Administration of Secondary School Counseling	3	
ECPY 650, Group Process and Practice	3	
ECPY 663, Multicultural Counseling	3	
ECPY 730, Social, Legal, Ethical Issues in Counseling	3	18

Additional Professional Courses (Three courses from the following will complete a Rank II): The remaining two courses not taken for the Rank II must be completed for the master's degree.

ECPY 631, Adolescence	3	
ECPY 605, Human Development	3	
ECPY 626, Consulting with Parents and Teachers	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 671, Psychology of Career Development	3	15

Upon satisfactory completion of the above coursework, students may apply for a Rank II. Satisfactory completion of the coursework below will fulfill the requirements for a M.Ed. (48 hours) and provisional certificate for secondary counseling. These credits also count toward a Rank I and Standard Counseling Certificate. 33

* Up to 12 hours of Professional Development units may be counted toward a Rank II program.

Master of Education in Secondary School Counseling Requirements (The M.Ed. includes all courses listed in the Rank II program above and 15 additional hours listed below).

ECPY 629, Theories and Techniques of Counseling	3	
ECPY 680, Counseling Practicum	3	
ECPY 680, Counseling Practicum	3	
Two courses not completed in the above section		
ECPY ___	3	
ECPY ___	3	15
Minimum Total		**48**

Master of Education in Counseling and Personnel Services with concentration in Student Personnel Services

Major: CPS
Concentration: STPS
Degree: MED
Unit: GE

	Semester Hours	Total
General Requirements		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDFD 680, The American College & University *or* EDFD 681, Philosophy of Higher Education	3	6
Professional Area Requirements		
ECPY 540, Evaluation and Measurement in Education	3	
ECPY 670, Career Counseling	3	
ECPY 629, Theories & Techniques of Counseling and Psychotherapy	3	
ECPY 650, Group Process and Practice	3	
ECPY 660, Introduction to Student Personnel Work	3	
ECPY 661, Theories of College Student Development	3	
ECPY 662, Student Affairs Programs, Policies, and Practice	3	
ECPY 663, Multicultural Counseling	3	
ECPY 681, Internship in College Student Personnel Services	3	
ECPY 705, Adult Development Theories	3	
ECPY 605, Human Development *or* ECPY 631, Adolescence	3	
ECPY 761, Program Development and Evaluation	3	
EDAD 682, Organization & Administration of Higher Education	3	36
Professional Electives		
(Two courses from the following list:)		
ECPY 619, Counseling Theories	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 664, College Student Subcultures	3	
ECPY 699, Thesis or Professional Paper	3-5	
ECPY 730, Social, Legal, and Ethical Issues in Counseling	3	
EDAD 607, Principles of Educational Leadership	3	
EDAD 680, Legal Issues in Postsecondary Education	3	
EDAD 686, The Two-Year College	3	
EDAD 730, Diversity in Educational Leadership	3	6-8
Minimum Total		**48-50**

Specialist in Education in Counseling and Personnel Services

Major: CPS
Degree: EDS
Unit: GE

The Ed.S. is a 30-hour degree program beyond the master's degree. Selective admission standards restrict this program to the superior graduate student in education.

Admission Requirements

1. An appropriate master's degree with a grade point standing of at least 3.3.
2. A combined score of 900 on the Verbal and Quantitative portions of the Graduate Record Examination.
3. Successful, relevant professional experience.
4. A written rationale for pursuing the degree.
5. A successful interview with a Departmental Committee.
6. Other selected evidence of academic and professional strengths of the applicant's choice.

Complete applications for admission must be submitted by March 15th or October 15th. A Department Committee of at least three faculty members will consider the applications and make recommendations about admissions to the Associate Dean by the end of the semester. Potential applicants should confer with the departmental chair before filing an application.

	Semester Hours	Total
General Requirements		
ECPY 648, Psychological Assessment I	3	
ECPY 649, Psychological Assessment II	3	
ECPY 680, Practicum in Counseling	3	10-13
ECPY 683, Internship in Counseling Psychology or Twelve hours of coursework designed to meet requirements for certification as a PSYCHOLOGICAL ASSOCIATE in the State of Kentucky.	12	12
Electives		12-17
ECPY 699 Professional Paper		3-6
Minimum Total		**30**

Master of Education in Counseling and Personnel Services with concentration in Counseling Psychology - Plan A

Major: CPS
Concentration: CPSG
Degree: MED
Unit: GE

	Semester Hours	Total
General Requirement		
EDFE 600, Introduction to Research Methods and Statistics	3	3
Professional Area		
ECPY 600, Introduction to Counseling and Psychotherapy	3	
ECPY 540, Evaluation and Measurement in Education	3	
ECPY 670, Career Counseling	3	
ECPY 619, Theories of Counseling and Psychotherapy	3	
ECPY 629, Theories & Techniques of Counseling	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 650, Group Process and Practice	3	
ECPY 663, Multicultural Counseling	3	
ECPY 680, Practicum in Counseling	3	
Practicum or Internship	3	
Elective or Thesis	3	33
Minimum Total		**36**

Master of Education in Counseling and Personnel Services with concentration in Counseling Psychology - Plan B

Major: CPS
Concentration: CPSL
Degree: MED
Unit: GE

Fulfills the State Board of Psychology's educational requirements to apply to sit for the exam for Psychological Associate.

	Semester Hours	Total
General Requirements		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDFD 601, Applied Statistics	3	6
Professional Area		
ECPY 540, Evaluation & Measurement in Education	3	
ECPY 600, Introduction to Counseling and Psychotherapy	3	
ECPY 619, Theories of Counseling and Psychotherapy	3	
ECPY 629, Theories & Techniques of Counseling	3	
ECPY 621, Differential Diagnosis	3	
ECPY 730, Ethical and Legal Issues in Counseling	3	
ECPY 671, Psychology of Career Development	3	
ECPY 663, Multicultural Counseling	3	
ECPY 648, Psychological Assessment I	3	
ECPY 649, Psychological Assessment II	3	
ECPY 775, Biological Basis of Behavior	3	
ECPY 605, Human Development	3	
ECPY 611, Learning Systems: Theory and Practice	3	
ECPY 680, Practicum in Counseling	3-3	
ECPY 683 Internship in Counseling Psychology	1	52
Applied Therapy Course - choose one from:		
ECPY 635, Family Assessment Concepts		
ECPY 650, Group Procedures and Practice		
ECPY 696, Seminar in Crisis Intervention		
ECPY 696, Seminar in Primary Prevention		
ECPY 697, Seminar in Drug and Alcohol Counseling *or* any applied Expressive Therapies course approved by advisor	3	3
Minimum Total		**55**

Master of Education in Counseling and Personnel Services with concentration in Community Counseling

Major: CPS
Concentration: COM
Degree: MED
Unit: GE

Fulfills the National Board for Certified Counselors (NBCC) educational requirements to sit for the exam for National Counselor Certification. Fulfills the requirement for a master's degree in counseling leading to the Certified Professional Counselor (CPC) endorsement.

	Semester Hours	Total
General Requirement		
EDFD 600, Introduction to Research Methods and Statistics	3	
Professional Area		
ECPY 600, Introduction to Counseling and Psychotherapy	3	
ECPY 540, Evaluation and Measurement in Education	3	
ECPY 670, Career Counseling	3	
ECPY 619, Theories of Counseling and Psychotherapy	3	
ECPY 629, Theories and Techniques of Counseling and Psychotherapy	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 650, Group Process and Practice	3	
ECPY 663, Multicultural Counseling	3	
ECPY 680, Practicum in Counseling	3	
Practicum or Internship	3	
ECPY 730, Social, Legal, and Ethical Issues in Counseling	3	
ECPY 750, Group Counseling: Advanced Theory and Practice	3	
ECPY 605, Human Development	3	
Related Elective	3	
Elective or Thesis	3	45
Minimum Total		**48**

Electrical Engineering

Master of Science in Electrical Engineering

Major: EE
Degree: MS
Unit: GS

Faculty

Chair
Darrel L. Chenoweth, Professor

Professors
Peter B. Aronhime
Samuel V. Bell, Jr., Emeritus
Kiron C. Bordoloi
Thomas G. Cleaver
Robert W. Cohn
Joseph D. Cole
J. Carroll Hill
Barry R. Horowitz
Leo B. Jenkins, Jr., Emeritus
William H. Pierce, Emeritus
Donald J. Scheer
Jacek M. Zurada

Associate Professors
Hollace L. Cox
Aly A. Farag
John H. Lilly
Kevin M. Walsh

Programs

The Department of Electrical Engineering of the Speed Scientific School, the school of engineering and applied science of the University of Louisville, offers a program of graduate study leading to the degree of Master of Science. It also offers an integrated five-year program of cooperative education leading to the professional degree Master of Engineering (described in the University's Undergraduate Catalog). In addition, it participates in the interdisciplinary master's programs.

The Department of Electrical Engineering also participates in the Ph.D. program in Computer Science and Engineering, offered jointly with the Engineering Mathematics and Computer Science Department.

Admission Requirements
Applicants for admission to the graduate (M.S.) program in Electrical Engineering should have a baccalaureate degree in Electrical Engineering from an A.B.E.T. accredited institution with a GPA of 2.75/4.0 or better. While no fixed minimum score on the Graduate Record Examination is required for admission, experience has shown that a combined score of 1500 (verbal+ quantitative+analytical) is a good indicator of success in a graduate program in electrical engineering. An applicant who does not meet some requirements, but whose credentials are otherwise acceptable, may be admitted on a conditional status provided his/her GPA is at least 2.50. New students will not normally be considered for financial aid until after two semesters of residency.

Advising
Upon initial enrollment, a student will be assigned a temporary advisor. Upon the completion of at least 12, but not more than 18 semester hours of graduate work, a permanent advisor, who will also serve as the student's thesis director, will be appointed by the department Chair. During the semester following the selection of the permanent advisor, the student should select the remaining members of the thesis committee. The committee should consist of the permanent advisor and at least two other graduate faculty members, one of whom must be from outside the Electrical Engineering Department.

	Semesters Hours	Total
Electrical Engineering		
Graduate-only (600) level courses (in addition to thesis)	12	
Courses chosen from graduate-only (600) or graduate (500) level	3-6	15-18
Area Other Than Electrical Engineering (mathematics, physics, or computer science recommended)		
Courses chosen from graduate-only (600) or graduate (500) level	6-9	6-9
M.S. Thesis	6	6
Minimum Total		30

Engineering Mathematics and Computer Science

Master of Science in Computer Science

Major: CS
Degree: MS
Unit: GS

Faculty

Chair
Khaled A. Kamel, Professor

Professors
Adel S. Elmaghraby
James H. Graham
Thomas L. Holloman
Melvin J. Maron
Carol A. O'Connor
Rammohan K. Ragade
Patricia A.S. Ralston
Arthur M. Riehl

Associate Professors
Dar-Jen Chang
Ahmed H. Desoky
Anup Kumar
Donald F. Linton, Emeritus
Gwong C. Sun, Graduate Advisor

Programs

The Department of Engineering Mathematics And Computer Science of the Speed Scientific School, the school of engineering and applied science of the University of Louisville, offers a program of study leading to the degree of Master of Science in Computer Science.

The Department also offers a doctoral program in cooperation with the Department of Electrical Engineering. For more information on the doctoral program refer to the program section on Computer Science & Engineering. The Department also offers an integrated five-year program of cooperative education leading to the professional degree of Master of Engineering with a specialization in Engineering Mathematics And Computer Science (described in the University's Undergraduate Catalog).

Admission Requirements
The admission requirements for the M.S. programs are essentially the same as the general requirements of the Graduate School. Prerequisites for each program are indicated in the program outlines.

Students interested in the M.S. programs should contact the Graduate Advisor of the Department of Engineering Mathematics and Computer Science.

Prerequisites: (not included in degree program)

1. A bachelor's degree.
2. Successful completion of EMCS 121, 207, 230, 302, 310, 325, 335, 360, and 420, or their equivalents.

	Semester Hours	Total
Required Courses		
EMCS 504, Automata Theory		
or EMCS 530, Design of Compilers	3	
EMCS 550, Software Engineering		
or EMCS 630, Data Base Design	3	
EMCS 619, Design and Analysis of Computer Algorithms		
or EMCS 545, Artificial Intelligence	3	
EMCS 622, Simulation & Modeling of Discrete Systems		
or EMCS 522, Performance Evaluation of Computer Systems	3	
EMCS 516, Fundamentals of Computer Communications and Networks		
or EMCS 629, Distributed System Design	3	
EMCS 506, Modeling and Analysis of Engineering Systems		
or EMCS 508, Numerical Analysis		
or EMCS 563 Experimental Design in Engineering	3	
EMCS 690, M.S. Thesis in Computer Science		
or 2 EMCS graduate courses for non-thesis options*	6	24
Elective Courses		
Computer Science	9	
Technical electives (may be from areas other than computer science)	3	12
Minimum Total		**36**

Notes:
A minimum of 18 semester hours (including computer science thesis credit) must be in courses numbered 600 or above.

Electives require approval of student's graduate committee or thesis advisor.

Languages such as C, C++, and JAVA might be needed. These are offered at the undergraduate level; not for graduate credit.

* Two EMACS graduate faculty with the student's advisor must devise a plan of study with the student during the first semester outlining the requirements for successful completion of the non-thesis option. The study plan will be forwarded to the graduate school for further approval and documentation.

English

Faculty

Chair
Debra Journet, Professor

Professors
William F. Axton, Emeritus
Dale B. Billingsley
Mary E. Burton, Emerita
Thomas B. Byers
Julia C. Dietrich
William F. Ekstrom, Emeritus
Lucy M. Freibert, Emerita
Alan C. Golding, Director of Undergraduate Studies
Susan M. Griffin
Dennis R. Hall
Suzette A. Henke, Thruston B. Morton, Sr. Professor
Robert H. Miller
Sena J. Naslund
Harold E. Richardson, Emeritus
Mary Ellen Rickey, Emerita
Jeffrey T. Skinner, Director of Creative Writing
Robert N. St. Clair
Thomas A. Van

Associate Professors
Beth Boehm, Director of Graduate Studies
Geoffrey A. Cross
Mary C. Flannery
Brian Huot, Director of Composition
Karen A. Mullen, Director of IESL
Mary I. Rosner

Assistant Professors
Paul F. Griner
Pamela D. Takayoshi
A. Elizabeth Willey

Instructor
Elaine Wise

Information

The Department of English, in the College of Arts and Sciences, offers a Master of Arts degree in English with concentrations in literature, rhetoric and composition, and creative writing. All students should obtain a copy of the English Department's Graduate Program Guidelines, available by request from the Director of Graduate Studies, English Department, University of Louisville, Louisville, Kentucky 40292, (502) 852-6801.

Financial Support
Financial support for English graduate students includes University Fellowships (Ph.D. program only), Graduate Teaching Assistantships, and Departmental Service Assistantships. All inquiries concerning financial support should be addressed to the Director of Graduate Studies, Department of English, 315 Bingham Humanities Building, Louisville, Kentucky 40292.

Satisfying Language Requirement
Students must satisfy the language proficiency requirement for the degree they are seeking in one of the following ways:

1. Demonstrate a reading ability, with the aid of a dictionary, during a three-hour exam administered by the Department of English. These examinations are usually given by a faculty member in the University of Louisville's Department of Classical and Modern Languages.
2. Pass, with the grade of A, a 300-level or higher, University of Louisville undergraduate course in an approved language. Courses taught in English translation will not qualify. These courses must be approved by the English Graduate Committee.

The Graduate Committee of the Department of English reserves the right to approve the language the student selects to fulfill the language proficiency requirement. Ordinarily the approved languages are: French, German, Spanish, Italian, Latin, Greek, and Russian.

Admission to the Ph.D.
There are a limited number of openings in the doctoral program; therefore, admission is competitive. All doctoral degree applicants should present the following documents:

1. Complete transcripts of previous undergraduate and graduate work;
2. Three letters of recommendation about the applicant's potential for success in a doctoral program;
3. A written statement of no more than a thousand words detailing the applicant's professional goals in the field of rhetoric and composition;
4. Reports on the Graduate Record Examination General Test are required. The Subject Test in Literature in English is recommended but not required;
5. A sample of scholarly, critical writing (15-20 pages);
6. International students must also present scores of at least 600 on the TOEFL Examination.

The English Graduate Committee reviews applications for the doctoral program in rhetoric and composition and makes all admission decisions. This committee considers complete applications to the Ph.D. program every spring. Applicants must have a Master's degree.

All applicants must fulfill the general requirements of the Graduate School.

Doctor of Philosophy in English Rhetoric and Composition

Major: ERC
Degree: Ph.D.
Unit: GA

Ph.D. Course Requirements

All doctoral students are expected to complete a minimum of 48 graduate hours, distributed as follows:

	Semester Hours	Total
Required:		
ENGL 602, Teaching of Language and Literature	3	
ENGL 620, Research in the Writing Process	3	
ENGL 671, History of Rhetoric I *or* 672, History of Rhetoric II	3	
ENGL 691, Theories of Interpretation	3	12
Three of the Following Courses:		
ENGL 670, Composition Theory and Practice	3	
ENGL 673, Rhetoric and Textual Analysis	3	
ENGL 674, Interdisciplinary Studies in Rhetoric and Composition	3	
ENGL 675, Studies in Professional Writing	3	
ENGL 681, Special Topics, Rhetoric	3	
ENGL 687, Seminar in Rhetorical Studies	3	9
One of the Following Courses:		
ENGL 621, Sociolinguistics	3	
ENGL 625, Teaching English as a Second Language	3	
ENGL 682, Seminar in Linguistics	3	
LANS 611, Recent Philosophy of Language	3	
PSYC 624, Language and Cognition I	3	
PSYC 625, Language and Cognition II	3	3
Three courses at the 600 level from among the literature courses offered through the Department of English.	9	9
One elective course, in rhetoric, linguistics, or literature, or a 500- or 600-level course from a related area in the School of Education or the College of Arts and Sciences. This elective must be approved by the Director of Graduate Studies.	3	3
Dissertation (690)	12-24	12-24

Ph.D. Language Requirement
Each doctoral student must demonstrate proficiency in one foreign language and either a second foreign language, an advanced level of proficiency in the first foreign language or a research or retrieval skill approved by the Graduate Director.

Time Limit and Residency for Ph.D.
All work for the Ph.D. must be completed within six years of admission to the program.

A year of full-time residency in the English doctoral program is the completion of two consecutive semesters of nine hours each.

For students holding Graduate Teaching Assistantships, a year of full-time residency in the English doctoral program is eighteen semester hours within a single academic year. Students ordinarily take nine hours of course work and teach six hours in the fall and spring terms. Summer registration for a maximum of six hours is optional.

Professional Requirements
Sometime during their tenure in the doctoral program, students must participate in a year-long supervised teaching-intern program. Fellowship holders must arrange their intern program with the Director of Composition before they sit the Comprehensive Examinations.

Intern experience may include teaching in regular freshman and advanced writing courses and tutoring in the Writing Clinic. Students who wish to complete their intern experience at another institution must make specific arrangements to do so with the Director of Graduate Studies in English. Such arrangements require the approval of the English Graduate Committee.

Graduate Teaching Assistants automatically fulfill the professional requirement once they have completed one successful year as a Graduate Teaching Assistant.

Comprehensive Preliminary Examination
When students have completed coursework, satisfied foreign language requirements, and received the approval of the Graduate Committee, they may sit the Comprehensive Preliminary Examination. This is a written specialist's examination given in three 3-6 hour sessions on alternate days during one week.

Admission to Candidacy
Students will be admitted to candidacy for the Ph.D. after they have completed coursework, met the foreign language requirements, and passed the comprehensive preliminary examination; they remain doctoral degree candidates until they complete the dissertation.

Dissertation
The doctoral dissertation requires the equivalent of a full year of graduate work and involves registration in 12-24 hours of work at the 690 level.

The Dean of the Graduate School, upon the recommendation of the Director of Graduate Studies in English, in consultation with the student, will appoint the dissertation director and reading committee. The dissertation committee will be appointed immediately after the approval, by the English Graduate Committee, of the student's dissertation prospectus. This approval must be submitted to the Office of Graduate Programs and Research at least nine months before the final dissertation oral examination.

Guidelines for writing the dissertation prospectus are included in the English Department's Graduate Program Guidelines. The dissertation will be submitted, in the form prescribed by the Graduate School, to the chairman of the department not less than six weeks before the end of the term in which the doctoral degree is to be conferred.

Final Oral Examination
The defense of the dissertation will be scheduled at least three weeks before the end of the term. The results of this examination shall be conveyed to the candidate in writing by the chairman of the department. The dissertation will then be revised according to the dissertation committee's recommendations and two copies shall be submitted to the Graduate School and one bound copy to the Department of English. Along with the dissertation, the candidate shall submit a 350-word abstract for publication in Dissertation Abstracts.

Master of Arts in English

Major: ENGL
Degree: MA
Unit: GA

Master's Degrees Admission

All Masters degree applicants should present the following documents:

1. Complete transcripts of previous undergraduate and any graduate work;
2. Two letters of recommendation, normally from persons with recent experience of applicant's academic performance;
3. Reports on the Graduate Record Examination, General Test and Subject Test in Literature in English;
4. A sample of critical writing (at least ten pages);
5. International students must also submit reports of the TOEFL examination.

Applicants presenting the following credentials are eligible for degree status in the English M.A. program:

1. A "B" or better average in the major from an accredited college or university;
2. A "B" or better average overall from an accredited college or university;
3. A score in the 50th percentile or better on the GRE Verbal and Advanced Literature sections;
4. Letters of recommendation that give promise of success in the program;
5. A writing sample that promises success in the program;
6. International students must also present scores of at least 600 on the TOEFL Examination.

The Director of Graduate Studies in English reviews all applications for Masters programs and makes all admission decisions. This director considers complete applications to the Masters programs throughout the academic year. Applicants with a B.A. in fields other than English, or with fewer than 24 credit hours for an English major, may be eligible for admission to the M.A., but the Graduate Committee may require that students make up deficiencies on an individual basis.

In extraordinary circumstances, an applicant with incomplete credentials may petition the English Graduate Committee for admission to conditional status. Admission in non-degree status is at the discretion of the English Department Director of Graduate Studies as governed by Graduate School policies.

All applicants must fulfill the general requirements of the Graduate School.

Degree Requirements

The Master of Arts in English requires 30 hours of academic work at the graduate level. After fulfilling the core requirements, students may take additional work in literary studies, creative writing, or rhetoric and composition.

Required Courses
1. English 601: Introduction to English Studies
2. English 691: Theories of Interpretation
3. Two courses in Pre-1800 literature
4. One course in Post-1800 literature

Students may take no more than three 500-level courses. Creative writing courses (including up to six hours of thesis guidance) may total no more than 15 hours.

Students may petition the Graduate Committee to take courses outside the Department of English that are relevant to their individual programs.

Foreign Language Requirement
The student must demonstrate proficiency in an approved foreign language. The foreign language requirement must be satisfied before the thesis can be defended. (See Satisfying Language Requirement)

Admission to Candidacy
Students are admitted to candidacy for the M.A. after they have completed coursework and met the foreign language requirement; they remain masters degree candidates until they complete a thesis or culminating project.

Thesis Option: 24 hours of coursework + 6 hours of thesis Guidance

Students who choose this option will be expected to write a critical or creative thesis that is a genuine contribution to the field, shows an awareness of current academic practice, and employs methods appropriate to an extended academic project. Students must submit a prospectus and have it approved at least three months before the thesis oral examination is held. Guidelines for writing a prospectus are in the English Department's Graduate Program Guidelines.

Non-Thesis Option: 30 hours of coursework + a culminating project

Students who choose this option may, as a culminating project, select one of their strongest seminars papers or creative writing projects to revise; the purpose of the project is to give students the opportunity to revise a seminar paper with publication in mind. To this end, students will write a brief prospectus (2-3 pages) indicating the intended place of publication and types of revisions they will make to the paper for that publication's audience. A screening committee will evaluate the prospectus, and upon its approval, the student will make the necessary revisions under the guidance of a faculty advisor.

Time Limit and Residency for Masters
All work for the M.A. must be completed within six years of admission to the program. The student must complete a minimum of 24 hours at the University of Louisville.

Expressive Therapies

Master of Arts in Art Therapy

Major: ARTT
Degree: MA
Unit: GX

Faculty

Director
Abby C. Calisch, Associate Professor

Assistant Professors
Claudia Ronaldson, Clinical Coordinator

Program

The Expressive Therapies Program offers a two-year curriculum leading to the Master of Arts in Art Therapy. A minimum of 45 semester hours is required for completion of the program. During the first year, emphasis is placed on theoretical foundations, media explorations and applications, and a limited clinical experience.

Students are introduced to a variety of therapeutic and learning models. Intensive study in the Expressive Therapies Continuum, graphic development, formal elements of visual expression, imagery, theories of creativity, symbolism, group and family processes, grief counseling, evaluation techniques, and expression and intervention through the use of media variables and content analysis of deviant production highlight the offerings. Areas of concentration are offered in family therapy, grief counseling, and group processes. Elective course work is available in other graduate departments and through the medical school.

The second year is spent working in the field at any one of a variety of settings throughout the metropolitan area, including, but not limited to, adult, adolescent and children's psychiatric hospitals and clinics, community mental health centers, substance abuse treatment centers, cancer centers, and public and private schools. Several other practicum settings are available in Kentucky and other states, including some with a stipend. Students are required to obtain professional insurance coverage at a minimal cost to the student and may be required to obtain a physical examination and innoculations by some practicum settings.

Applicants must have a background in the creative arts and the behavioral sciences. Undergraduate course prerequisites in psychology include: general or introductory psychology, developmental, abnormal, personality theory, and an introductory statistics course. Undergaduate course prerequisites in art include: a basic drawing course, a course in painting, a course using clay, and two other studio courses of the student's choice.

In addition to the requirements of the Graduate School for admission (a 3.0 undergraduate GPA and acceptable GRE scores) each candidate must also submit a autobiographical sketch, two letters of recommendation, and a portfolio of art slides (12 of varied art media). When this information is received and reviewed, candidates may be extended an invitation to interview with the faculty.

In addition to academic competence, the student must exhibit those personality and interpersonal qualities which, in the judgment of the faculty, are necessary to the pursuit of a successful and meaningful career as an art therapist. Application deadline is January 15th. Applications are processed in the order they are received. The faculty reserves the right to recommend rejection of an applicant or dismissal of a student on the basis of personality or apparent lack of qualifications for rendering therapeutic services.

	Semester Hours	Total
Required Courses		
ET 601, Theories of Art Therapy I	2	
ET 603, Clinical Art Therapy I	2	
ET 604, Evaluation Techniques in Art Therapy	2	
ET 606, Clinical Art Therapy I	2	
ET 611, Applied Methods	2	
ET 618, Field Studies	2	
ET 621, Topical Seminar in Research	2	
ET 622, Master's Research Seminar	3	
ET 623, Practicum I	5	
ET 624, Practicum II	5	
ET 642, Symbols of Self-Actualization	2	
ET 648, Advanced Group Art Therapy	2	
ET 661, Theories of Psychotherapy	3	34
Elective Courses		
Minimum of 11 hours selected, with approval of advisor from department, to include areas such as expressive therapies, psychology, social work, education, research, medicine, and independent study.	11	11
Minimum Total		**45**

Faculty

Chair
James T. Grubola, Professor

Professors
Donald R. Anderson
Ying Kit Chan
Henry Chodkowski, Jr.
Dario A. Covi, Allen R. Hite Emeritus Professor of Fine Arts
Robert L. Douglas, Sr.
Stephanie J. Maloney
Suzanne Mitchell, Emerita
William D. Morgan, Emeritus
Steven Skaggs
John Whitesell

Associate Professors
Thomas Buser
Linda M. Gigante
Lida G. Gordon
Barbara L. Hanger
Jay M. Kloner

Programs

The Department of Fine Arts offers a Ph.D. in art history and master's degree in history of art or creative art (fibers, printmaking, ceramics, or painting and sculpture). Specific courses also serve the needs of advanced undergraduate and graduate students in other fields who are qualified for the specific study.

Students who have a bachelor's degree with a "B" average or better from a duly accredited school are eligible for admission to the Graduate School of the University. They will be admitted as full-time students to the departmental master's program upon demonstration of qualifications appropriate to each program.

The master's degree requires 30 semester hours.

Ph.D. in Art History

Major: ARTH
Degree: PHD
Unit: GA

Coursework required for the Ph.D. Degree in Art History includes completion of the M.A. plus 15 hours ARTH 500-level electives, 15 hours ART 600-level electives, 12 hours ARTH 745, Dissertation Research, for a total of 72 hours. Additional 600-level courses may be substituted for 500-level.

Up to a total of 15 hours of 500 or 600 level electives outside Art History may be substituted for Art History electives of similar level provided they are appropriate and are approved in advance by the student's advisor.

Each student must complete at least one graduate-level course in each of the following areas: Ancient, Medieval, Renaissance, Baroque, and Modern. Students who have not completed that distribution as part of the M.A. will have to do so before completing the Ph.D.

The Art History Placement Review must be taken during the first semester in the Art History Program. It is normally given in the first week of September and the first week of February.

Two languages, either French or German and one additional language appropriate to the student's course of study, are required. This requirement may be fulfilled by demonstrating reading competence at the intermediate level in one of three ways: placement exam; completion of undergraduate coursework at the intermediate level with a grade of B or better; or passing a departmentally-administered language exam. The requirement in one language must be fulfilled in the first year.

Through course work and independent study, each student must prepare her/himself to pass a comprehensive exam in two areas before admission to candidacy. Language requirements must have been met and most coursework completed before a student may take this exam.

After being admitted to candidacy, the student must write a dissertation and defend it in a final oral examination.

Master of Arts in Art History

Major: ARTH
Degree: MA
Unit: GA

Master of Arts in Art History

Applicants for admission to the master's program in Art History are expected to demonstrate competence in the history of art equivalent to an undergraduate major.

The Art History Placement Review must be taken during the first semester in the Art History Program. It is normally given in the first week of September and the first week of February.

The requirements of one foreign language must be satisfied during the first year in the Art History Program.

Language requirements may be fulfilled by completing the intermediate level (usually 12 hours) of a language with a grade of B or better or by taking a departmentally administered language exam. Language exams are scheduled for the first Friday in October and March.

Candidates for the degree are required to complete 30 hours of academic work at the graduate level including Approaches to Art History (ARTH 540) and one course in each of the following areas: ancient, medieval, renaissance, baroque, and modern and write a thesis. Up to 6 hours may be for thesis guidance (ARTH 645-646). Candidates are required to complete a minimum of 12 hours (exclusive of thesis guidance) on the 600 level, of which at least 9 hours must be in art history.

The thesis consists of a research paper demonstrating critical knowledge of relevant sources, skill in analysis and interpretation, and ability to present the results in a well-organized and intelligent manner. The thesis must be defended in an oral examination administered by the Graduate School. A reading knowledge of two European languages is required (see above).

Master of Arts in Art (Creative)

Major: ARTC
Degree: MA
Unit: GA

Candidates for the master's degree in creative art must include in their program a minimum of 12 hours in the major field and 9 hours in the history of art, all of which must be taken at the graduate level, and present a thesis. Up to 6 hours may be for thesis guidance (ART 645-646). A minimum of 12 hours exclusive of thesis guidance must be on the 600 level. All candidates must complete 30 hours of credit for the degree. The thesis consists of a studio project, which must be included in an authorized exhibition of the candidate's work during the last semester of study. To accompany this exhibition, the candidate must submit a catalog containing a prefatory statement by the candidate, a properly documented list of the works in the exhibition, photographic reproductions of the works in one of the following forms: black and white photographs, color photographs, or slides placed in plastic sleeves to be bound into the thesis. The catalog will be submitted in conformity with the regulations governing the form and presentation of the written master's thesis. The department retains one work from the exhibition.

Training equivalent to an undergraduate major is required for admission to the program. To demonstrate his/her ability to pursue study on a graduate level, a student must submit examples of his/her work to the department by November 1 for spring semester admission and April 1 for fall semester admission.

Master of Arts in Teaching in Art Education (certification in grades K-12)

Major: EDAR
Degree: MAT
Unit: GE

Admission Requirements

1. Admission to Graduate School
2. Admission to Teacher Education
3. Completion of the Pre-Teacher Education Core
4. Completion of the undergraduate teaching major in Art (K-12)

	Semester Hours	Total
Fall Semester		
ART 508, Art Education Methods/Research I	3	
ART 518, Art Education Methods/Research II	3	
EDSD 605, Pre-Student Teaching	6	12
Spring Semester		
EDUC 620, Art Student Teaching: Elementary/Secondary I	4	
EDUC 621, Art Student Teaching: Elementary/Secondary II	4	
EDSD 609, Student Teaching Seminar	3	
EDSD 610, Capstone Seminar	1	12
Academic Teaching Field		
(courses selected in consultation with advisor)	6	6
Minimum Total		**30**

Foreign Language Education

Master of Arts in Foreign Language Education

Major: FLE
Degree: MA
Unit: GA

The interdisciplinary M.A. in Foreign Language Education is intended primarily for experienced teachers of foreign languages, including English as a second language.

The program is administered by the Department of Classical and Modern Languages. The main goals are to develop a theoretical and practical awareness and knowledge of the trends in the teaching and learning of foreign languages in the United States.

Contact Person:
Professor Howard B. Altman, Director (Department of Classical and Modern Languages)

	Semester Hours	Total
Core Courses		
FLE 521, Teaching in Foreign Languages	3	
One course from the following:		
FREN 523, Advanced Composition and Conversation SPAN 523, Advanced Composition and Conversation GERM 523, Advanced Composition and Conversation	3	
One Course from the following:		
FREN 624, Applied French Linguistics SPAN 624, Applied Spanish Linguistics GERM 624, Applied German Linguistics	3	
EDFD 640, Developing a Philosophy of Education	3	
EDSD 640, Developing the Curriculum in the Secondary School	3	
ML 601, Introduction to Graduate Studies	3	18
Optional Courses		
Fifteen hours chosen from courses below: (Choice must be approved by program advisor.)		
EDFD 600, Introduction to Graduate Studies in Education	3	
FLE 522, Media in Foreign Language Teaching	2	
FLE 523, The Teaching of Foreign Literature	2	
FLE 524, Teaching English as a Second Language	3	
FLE 561, Independent Study	1-3	
FLE 561, Independent Study	1-3	
FLE 600, Summer Workshop for Foreign Language Teachers	3	
FLE 620, Special Topics in Foreign Language Education	1-3	
FLE 622, Psychology of Second Language Learning and Teaching	3	
FLE 623, Culture as the Basis of Foreign Language Teaching	3	
FLE 690, Thesis	3	
Course work in a second foreign language	1-9	
Specific languages and literature courses (emphasis to be on twentieth century)	1-9	
Anthropology	1-6	
Psychology	1-6	
Sociology	1-6	
Interdisciplinary linguistics courses	1-6	15
Minimum Total		**33**

Foundations of Education

Faculty

Chair
Everett Egginton, Professor

Professors
Edward H. Berman, Emeritus
Joseph M. Petrosko
Gordon C. Ruscoe, Emeritus

Associate Professors
Kenneth E. Duckworth
Stephen K. Miller
Keith L. Raitz

The Foundations of Education Department supports the School of Education's programs in teaching, research, and service. In the area of teaching, the Department offers basic and advanced courses in research and urban education, many of which are specifically designed for doctoral students; provides assistance to graduate students in the design and implementation of research; and directs the doctoral program in education evaluation.

In the area of research, members of the Department work with teachers and other educational professionals in collaborative investigations as well as conducting research on the historical, philosophical, and sociological bases of schooling and education. In the area of service, the Department provides training and technical assistance to students and educational professionals from Latin America.

Geography and Geosciences

Faculty

Chair
Clara A. Leuthart, Associate Professor

Professors
Anthony O. Clarke
James E. Conkin
A. William Dakan
Jafar Hadizadeh
David A. Howarth
George A. Lager

Programs

The Department of Geography and Geosciences offers courses that may be applied toward graduate degrees in other areas. Students must obtain their program advisor's permission before enrolling in these courses.

The M.A. in Sociology program offers a concentration in geography. For more information contact A. William Dakan.

Core Courses	Semester Hours	Total
SOC 510 Computer Data Analysis	3	
SOC 604 Proseminar in Sociology	1	
SOC 610 Seminar in Statistics	3	
SOC 615 Seminar in Research Methodology	3	
SOC 620 Seminar in Sociological Theory	3	
THESIS OPTION		
GEOG 656 Spatial Statistics	3	
GEOG 657 Geographic Information Systems	3	
GEOG 658 Analytical Urban Geography	3	
One of the following:		
GEOG 530 Urban Transportation	3	
GEOG 561 Urban Environmental Quality	3	
GEOG 578 Downtown Growth and Development	3	
GEOG 628 Advanced Urban Planning	3	
GEOG 635 Advanced Retail Site Analysis	3	
SOC 600 Thesis	6	
Minimum Total		**31**
INTERNSHIP OPTION		
GEOG 656 Spatial Statistics	3	
GEOG 657 Geographic Information Systems	3	
GEOG 658 Analytical Urban Geography	3	
Three of the following:		
GEOG 530 Urban Transportation	3	
GEOG 561 Urban Environmental Quality	3	
GEOG 578 Downtown Growth and Development	3	
GEOG 628 Advanced Urban Planning	3	
GEOG 635 Advanced Retail Site Analysis	3	
SOC 600 Thesis	6	
or GEOG 691 Internship	6	
Minimum Total		**37**
COMPREHENSIVE EXAM OPTION		
GEOG 561 Urban Environmental Quality *or* GEOG 628 Advanced Urban Planning	3	
GEOG 635 Advanced Retail Site Analysis	3	
GEOG 656 Spatial Statistics	3	
GEOG 657 Geographic Information Systems	3	
GEOG 658 Analytical Urban Geography	3	
Other Sociology and Geography Courses		
Must include at least 3 hours at the 600-level. Six hours of courses outside Geography and Sociology may be selected with the permission of the departmental advisor.	9	
Minimum Total		**37**

Health Promotion, Physical Education, and Sport Studies

Master of Arts in Teaching in Physical Education (certification in grades K-12)

Major: P ED
Degree: MAT
Unit: GE

Faculty

Chair
Richard A. Fee, Professor

Professors
Sharleen Johnson Birkimer
Cheryl A. Kolander
P. Joanne Rowe
Bryant A. Stamford

Associate Professors
Jacalyn L. Lund
Ann M. Swank
William T. Weinberg

Programs

The Department of Health Promotion, Physical Education, and Sport Studies offers programs leading to the Master of Education in Physical Education, the Master of Science in Exercise Physiology, and the Master of Arts in Teaching in Physical Education. The department also offers a concentration in Sport Administration as part of the Master of Arts degree in Higher Education.

Students pursuing the M.S. in Exercise Physiology may select either a thesis or non-thesis option. The thesis option requires two full years of study including summer between the first and second years. Students in this option are required to actively participate in all phases of basic research within the laboratory. The non-thesis option is for students interested in the use of exercise from a clinical standpoint. This program is designed to expose the student to a variety of health-related aspects of exercise, and is heavily oriented toward improvement of cardiovascular health through the use of exercise.

General requirements for the MAT are outlined in a section entitled The Master of Arts in Teaching Program in the front section of this bulletin. The M.A.T. is designed for students seeking teacher certification. Please contact the department for more information.

Admission Requirements
1. Admission to Graduate School
2. Admission to Teacher Education
3. Completion of the Pre-Teacher Education Core

	Semester Hours	Total
Professional Education Courses		
HPES 604, Research Methods in HPES	3	
HPES 605, Methods in Elementary Physical Education	3	
HPES 606, Methods in Secondary Physical Education	3	
HPES 607, Methods of Supervision in Physical Education	3	
HPES 608, Curriculum: Achievement Based Approach	3	
HPES 610, Experiential Outdoor Education Leadership	3	18
Exit Requirement		
HPES 611, Seminar: Student Teaching in Physical Education	3	
HPES 612, Student Teaching in Physical Education I	6	
HPES 613, Student Teaching in Physical Education II	6	
HPES 614, Action Research Project	3	18
Miminum Total		**36**

Master of Education in Physical Education

Major: P ED
Degree: MED
Unit: GE

	Semester Hours	Total
Core Requirements		
EDFD 600, Introduction to Research Methods and Statistics	3	
HPES 604, Research Methods in HPES	3	
HPES 631, Organization & Administration of Health Education and Promotion	3	
HPES 655, Current Trends & Studies in HPES	3	
SPAD 625, Sport Administration	3	
The student must choose, with approval of an advisor, a course offered in the historical, sociological, or philosophical foundations of education, to be selected from among the following: EDFD 620, 625, 629, 630, 640, 680, 681	3	18
Content Area		
Students must complete one of the following Content Areas:		
Adapted Physical Activity		
HPES 619, Practicum: Psychomotor Assessment of Dysfunctions in Adapted Physical Activity	3	
HPES 620, Instructional Design in Adapted Physical Activity	3	
HPES 621, Diagnostic/Assessment in Adapted Physical Education	3	
HPES 697, Special Topics in HPES	3	
Related Electives: Approved by advisor	6	18
Pedagogy		
EDFD 601, Applied Statistics	3	
HPES 607, Methods of Supervision in Physical Education	3	
HPES 625, Instructional Leadership in Physical Education	3	
HPES 697, Special Topics in HPES	3	
Related Electives: Approved by advisor	6	18
Psychology and Motor Development		
HPES 650, Personality & Social Development in Sport	3	
HPES 659, Motor Control & Learning: Lab	3	
HPES 660, Motor Control and Learning	3	
HPES 697, Special Topics in Physical Education	3	
Related Electives: Approved by advisor	6	18
School & Community Health		
HPES 562, Alcohol and Drug Education	3	
HPES 675, Health Promotion & Disease Prevention at the Individual Level	3	
HPES 676, Community Health Promotion & Disease Prevention	3	
HPES 684, Program Planning in Health Education & Promotion	3	
Related Electives: Approved by advisor	6	18
Sport Administration		
SPAD 618, Rise of the Sport System in America	3	
SPAD 683, Sport Marketing	3	
SPAD 689, Legal Aspects in the Sport Industry	3	
SPAD 692, Internship in Sport Administration	3	
Six hours of electives selected from the following:		
SPAD 505, Sport Facility Management	3	
SPAD 529, American Woman in Sports	3	
SPAD 624, Administration of Professional Team Sports	3	
SPAD 635, Research in Sport Administration	3	
SPAD 661, Special Topics in Sport Administration	3	
SPAD 680, Athletics and Higher Education	3	
SPAD 684, Current Trends/Issues in Sport Administration	3	
SPAD 685, Case Studies in Sport Administration	3	18
Fitness/Wellness		
EXP 503, Selected Topics in Exercise Physiology	3	
HPES 629, Introduction to Health Consultation	3	
HPES 630, Nutrition and Athletic Performance	3	
HPES 675, Health Promotion and Disease Prevention at the Individual Level	3	
HPES 684, Program Planning in Health Education and Promotion	3	
Related Electives: Approved by advisor	3	18
Exit Requirement		
Student must complete two of the following: Thesis, Research Project (if not taken as undergraduate), Written Examination, or Practicum.		
Minimum Total		**36**

Master of Science in Exercise Physiology

Major: EXP
Degree: MS
Unit: GE

Required Courses for Each Option

	Non-Thesis	Thesis
EXP 501, Applied Exercise Physiology	3	3
EXP 502, Principles of Exercise Testing and Prescription	3	
EXP 600, Physiology of Exercise	3	3
EXP 601, Lab Methods in Exercise Physiology	3	3
EXP 603, Seminar in Exercise Physiology	3	3
EXP 605, Human Physiology	3	3
EXP 606, Case Study Practicum	3	
EXP 611, Principles of Electrocardiography	3	3
EXP 620, Exercise Physiology Clinical Internship	3-5	
EXP 699, Thesis		1-6
HPES 604, Research Methods *or* EDFD 601, Applied Statistics		3
HPES 630, Nutrition and Athletic Performance	3	3
Selected with approval of advisory committee	3-4	3-4
	38	**33**

* Courses in the Exercise Physiology curriculum not required for the thesis degree may serve as elective credits.

(Note: Clinical internship is available for 3 credit hours for thesis option.)

History

Faculty

Chair
Thomas C. Mackey, Associate Professor

Professors
Bruce F. Adams
Ann T. Allen
John T. Cumbler, Jr.
Benjamin T. Harrison, Vice Chair and Director of Graduate Studies
Robert B. Kebric
Justin A. McCarthy
Andrea L. McElderry
Nancy M. Theriot
Lee Shai Weissbach

Associate Professors
Mark E. Blum
Susan J. Herlin
Thomas C. Mackey
Kerry E. Spiers
Bruce M. Tyler
Jonathan R. Ziskind

Assistant Professors
Blake R. Beattie
Tracy E. K'Meyer
John E. McLeod

Program

The Department of History, in the College of Arts and Sciences, offers programs leading to the degrees of Master of Arts.

Admission
The department shall admit unconditionally, by act of the Director of Graduate Studies, those students who have a 3.00 on a 4.00 point scale overall grade point average and who meet the other requirements for admission set by the Department. Those students whose overall average is between 2.86 and 2.99 on a 4.00 point scale, and who meet the other requirements for admission, will be accepted conditionally by act of the Director. Those whose average is between 2.50 and 2.85 on a 4.00 point scale, and who meet the other requirements for admission, may be admitted conditionally at the discretion of the Departmental Graduate Committee after an inspection of the student's total record. Applicants whose records are based on a 3.00 grade scale will be judged in equivalency to a 4.00 point grade scale.

The Department requires the aptitude section of the Graduate Record Examination (GRE). A combined score of 900 on the Verbal and Quantitative sections is expected for unconditional admission.

No student will be admitted to degree status until all materials required for his or her file have been submitted, and the student meets all other requirements.

The Department may admit students to pursue course work with non-degree status by act of the Director of Graduate Studies.

The Department will admit otherwise qualified students who have a minimum of 18 undergraduate hours in history. Students with fewer than 18 undergraduate hours in history will be required to take post-baccalaureate undergraduate hours sufficient to raise the total number of undergraduate hours in history to 18. The Director of Graduate Studies will determine which of these courses, if any, may apply to the approved graduate program, but in no case may more than six apply.

Course Load
A normal graduate load in this department will be 9 hours or three courses, and in no case will more than 12 hours or four courses be taken during any one regular semester. The course-load decision will be made by the Director.

M.A. candidates have the option of taking up to 6 hours of course work outside of the Department. Those hours must be directly relevant to the student's academic program, and can be taken only with the consent of the Director of Graduate Studies.

In a student's approved graduate program, no Pass-Fail courses will apply, unless the History Department itself creates Graduate Pass-Fail courses. No more than 6 hours of Directed Studies or Independent Studies (601-602, 501-502) will be allowed in a student's approved program.

Quality of Work
Whenever any student's cumulative quality-point total falls below 3.00, the student will be warned and may be subject to dismissal.

Failure of non-degree students to maintain a 2.00 average will result in termination.

Student Appeals
Student appeals concerning departmental guidelines will be submitted to the Director, who will forward the appeal to the Department's Graduate Committee for decision.

Master of Arts in History

Major: HIST
Degree: MA
Unit: GA

Each candidate for the M.A. in History will define areas of major and minor emphasis in consultation with the Director of Graduate Studies. This program of studies normally must be approved by the Graduate Director before the student enrolls for the second semester of work.

Students may opt for a degree program with thesis, or with comprehensive exam.

	Thesis Exam	Option Exam
Required Course Work		
Major Area of Emphasis	15-18	18-21
Secondary Area of Emphasis	16-12	9-15
Electives	0-6	0-6
Thesis	3	0
Minimum Totals	**30**	**33**

For the thesis option student, at least 15 hours (exclusive of thesis) must be at 600 level. At least 12 of these hours must be in the major area, including at least 3 hours in a traditional research-writing seminar in preparation of thesis.

For the exam option student, at least 18 hours must be at the 600-level. At least 15 of these hours must be in the major area, and must include at least 3 hours of readings in preparation for the Comprehensive Examination. At least 6 hours must be in traditional research-writing seminars in either the major or minor area of emphasis.

For M.A.-level work in certain areas knowledge of one or more foreign languages or knowledge of other specialized research tools may be required.

Students will be allowed to transfer up to 6 hours from outside the University, and with the permission of the Graduate Director, take up to six hours of relevant course work outside the department, within the University.

Thesis for Master of Arts
The candidate must satisfactorily complete and defend a thesis (3 hours credit). The thesis title and the name of the supervising director will be filed with the Director of Graduate Studies before work on the thesis is begun.

The member of the History Department under whose direction the thesis is written will be the chairman of the candidate's committee. One other member of the History Department and a third faculty member who may be from outside the Department will also serve on the Thesis Committee. The thesis will be read by all members of the Committee, and the Committee will conduct an oral examination of the candidate (except in unusual circumstances) on the subject matter of the thesis and on the area of history in which the topic falls (which will be the candidate's major area of concentration).

If the members of the Thesis Committee are satisfied with the candidate's performance, and if the student has fulfilled the other requirements listed above, the student will be certified for the Master of Arts degree in history.

Comprehensive Exam for the Master of Arts
The candidate must satisfactorily complete Comprehensive Examinations, both written and oral, designed to show mastery of materials in both major and minor areas of emphasis. A Comprehensives Committee, normally three members of the History Department Faculty chosen by the Graduate Director in consultation with the student, will write and administer the exams. The written and the oral examinations will cover the student's major and secondary areas of concentration and will assume a general understanding of the major subject area. Normally the written examination will take up to three hours and the oral examination one hour. Each member of the Committee will read the written exam, and jointly conduct the oral exam. However, a faculty member from outside the Department may be asked (at the discretion of the Graduate Director) to augment the Committee when such a person has directed a significant amount of the student's work. The augmenting member may submit and read separate questions, or may be asked to read those devised by the History faculty. This member may also participate in the oral exam.

If the members of the Comprehensives Committee are satisfied with the candidate's performance, and if the student has fulfilled the other requirements listed above, the student will be certified for the Master of Arts Degree in History.

Humanities

Master of Arts in Humanities

Major: HUM
Degree: MA
Unit: GA

Faculty

All members of the graduate faculties of the Departments of English, Fine Arts, Classical and Modern Languages, Music History, Philosophy, and Theatre Arts, and of the Division of Humanities, as well as occupants of the Bingham Chair in Humanities and the Justus Bier Distinguished Professor of Humanities.

Chair
Elaine O. Wise, Assistant Professor, Department of English

Professors
Riffat Hassan, Religious Studies
John W. Shumaker, Humanistic Studies, University President
Arthur J. Slavin, Justus Bier Distinguished Professor of Humanities, Emeritus

Associate Professor
Mary Ann Stenger, Religious Studies

Programs
The Humanities Division of the College of Arts and Sciences offers two concentrations leading to the degree of Master of Arts. Procedures and standards of admission to the degree program are given in the General Information section of this catalog.

For the traditional concentration, the applicant will be expected to have an undergraduate background of some depth in at least two of the following disciplines: art history, literature, classical and modern languages, music history, philosophy, theatre arts, and religious studies, or in one of the following interdisciplinary cultural studies periods: ancient, medieval-renaissance, early modern (17th and 18th centuries) or modern. Those who do not meet this requirement will be required to take undergraduate courses before admission is granted.

For the concentration in Humanities and Civic Leadership, the applicant will be expected to have worked in a profession for ten years (or for five years if the applicant has completed a graduate or professional degree program). Scores from the GMAT, LSAT, MCAT, or other professional examination may be substituted for the GRE General Test. Completion of the M.A. Concentration in Humanities and Civic Leadership Application Form and a 1000-word Statement of Intent are required to be considered for admission.

Requirements for the M.A. in Humanities, traditional concentration:

1. A total minimum of 30 semester hours as follows:
   - 12 semester hours in one of the following areas: art history, literature, classical & modern languages, music history, philosophy, theatre arts, religious studies, ancient studies, medieval-renaissance studies, early modern (17th and 18th century) studies, or modern studies;
   - 3 semester hours in methodology (HUM 609 or 610 or appropriate substitute approved by the chair);
   - 6 semester hours in Thesis Guidance (HUM 645 A-F);
   - 9 semester hours of electives approved by the chair.
2. A minimum of 15 semester hours must be in courses on the 600 level, excluding thesis hours.
3. Students who do not have one of the Humanities 591-596 sequence in their undergraduate record will be required to take one of these as part of their electives.
4. Pass a competency exam in French, German, or an approved alternate foreign language.
5. An oral examination covering the content of the thesis.

Requirements for the M.A. in Humanities, concentration in Humanities and Civic Leadership:

1. A total minimum of 30 semester hours as follows:
   - 12 semester hours in one of the following areas: art history, literature, classical and modern languages, music history, philosophy, theatre arts, religious studies, ancient studies, medieval-renaissance studies, early modern (17th and 18th century) studies, or modern studies;
   - 3 semester hours in methodology (HUM 609 or 610 or appropriate substitute approved by the chair);
   - 6 semester hours in Internship in Humanities and Civic Leadership (HUM 650);
   - 3 semester hours in Research or Directed Study Project (HUM 651 or 652);
   - 3 semester hours in Interdisciplinary Seminar (HUM 596 or 695);
   - 3 semester hours in elective approved by the chair.
2. A minimum of 15 semester hours must be in courses on the 600 level, excluding research or directed study project.
3. Students whose Statements of Intent demonstrate need for a course in professional writing will be required to take such a course as their elective. Competency in a foreign language is not required.
4. An oral examination covering the content of the research or directed study project and the content of the internship in Humanities and Civic Leadership.

Industrial Engineering

Doctor of Philosophy in Industrial Engineering

Major: IE
Degree: PHD
Unit: GS

Faculty
Chair
Suraj Alexander, Professor

Professors
William E. Biles, Clark Professor of Computer-Aided Engineering
Gerald W. Evans
Waldemar Karwowski
Herman R. Leep
Hamid R. Parsaei
John S. Usher
Thomas L. Ward, Emeritus
Mickey R. Wilhelm, Associate Dean for Research

Associates
Mahesh Gupta
Terence Hancock
Jon Hill Rieger
J. W. Yates

Programs
The Department of Industrial Engineering in the Speed Scientific School, the school of engineering and applied science of the University of Louisville, offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy. It also offers an integrated five-year program of cooperative education leading to a B.S./M.Eng. professional degree.

Pass-Fail Grading
The Department of Industrial Engineering does not offer courses on the pass-fail basis. Neither does it accept for credit courses outside the department that have graded on a pass-fail basis.

The general requirements of the Doctor of Philosophy program are the same as those of the Graduate School. Other specific guidelines for the Ph.D. degree in Industrial Engineering include a minimum total of 76 semester hours of post-baccalaureate degree courses, including no more than 18 semester hours for doctoral dissertation credit.

Applicants to the program will normally have completed a master's degree; however, a qualified student may be admitted directly to the doctoral program after receiving the B.S. degree. Students with a B.S. in another branch of engineering, or in chemistry, physics, or mathematics are required to resolve undergraduate deficiencies by taking up to 25 semester hours of industrial engineering coursework. Students with a B.S. in areas other than the above are required to take at least 25 semester hours of undergraduate industrial engineering courses, and to demonstrate mathematical preparation comparable to that provided by an ABET accredited engineering program. Typically, an acceptable undergraduate record in mathematics would include calculus, differential equations, linear algebra, and probability and statistics.

Potential applicants to the Ph.D. degree program are encouraged to request more detailed information regarding program requirements from the Department of Industrial Engineering.

Master of Science in Industrial Engineering

Major: IE
Degree: MS
Unit: GS

Admission to the Master of Science
Students with a baccalaureate in industrial engineering or other engineering field must complete or have completed the following courses or their equivalents.

IE 360, Engineering Probability & Statistics
IE 320, Manufacturing Processes
IE 321, Facility Location and Layout I
IE 340, Work Measurement and Methods
IE 415, Introduction to Operations Research
IE 590, Math CAD Applications in Industrial Engineering

Students with a baccalaureate in a field other than engineering (e.g., mathematics, physics, psychology) must complete or have completed all of the courses listed above, plus any other courses his/her thesis advisor deems appropriate. Courses taken to meet background requirements are not counted as credit toward fulfilling the requirement.

Advising
Master of Science students will be advised by the Program Coordinator in consultation with another member of the program faculty.

Degree Requirements
The general requirements of the Master of Science program are the same as those of the Graduate School as outlined in the General Information section of this catalogue. Students must complete a minimum total of thirty graduate hours including thesis. A minimum of twelve hours should be at the 600 level. Students must select a thesis advisor prior to registering for his/her second semester.

Specifically, students must satisfactorily complete:

	Semester Hours	Total
Required Courses		
IE 541, Simulation	3	
IE 570, Engineering Design Economics*	3	
IE 600, Advanced Manufacturing Methods	3	
IE 630, Production Planning and Control	3	
IE 681, Human Performance	3	
IE 690, M.S. Thesis in Industrial Engineering	6	21

* Substitution possible, if student has had a course in Engineering Economy.

Elective Courses
With advisor approval, the student must complete three courses in one of the following areas:
Operations Research and Systems
Manufacturing Engineering
Human Factors Engineering
Production Systems 9 9

Minimum Total 30

Course Descriptions Graduate School Home Page

Interdisciplinary Studies

Programs

Master of Arts and Master of Science degree programs in interdisciplinary studies are available to qualified students who wish to structure graduate programs crossing traditional disciplinary lines. These programs are administered through the Office of Research and Graduate Programs, since admission procedures for these programs are necessarily more complex than those for more traditional graduate programs.

Students wishing to enroll in these programs should contact the Dean of the Graduate School, for information about application and development of a program and for details about the general regulations relating to master's degrees and their application to these programs.

Application and Admission

Applicants for individualized interdisciplinary master's programs must present complete admission credentials in order to be formally admitted by one of their constituent departments. Such formal admission must be recommended by at least one department or program offering degrees through the Graduate School before the student may register for course work. The required credentials are:

1. The application for admission, specifying which departments the student expects to comprise the program;
2 transcripts showing all undergraduate and graduate course work and all degrees earned;
3. scores on the Graduate Record Examination General Test.
4. three letters of recommendation;
5. TOEFL score if the applicant's native language is not English and he/she has not earned a degree from a university or college in the U.S.;
6. a written statement of career objectives and rationale for the interdisciplinary research objective.

All these credentials must be sent to the Office of Admissions, University of Louisville, for distribution to the appropriate offices.

Only upon receipt of letter of admission from the Office of Research and Graduate Programs may the applicant enroll for course work. There is no guarantee, however, that the desired degree program will be approved. Admission will be conditional until the program proposal has been submitted and approved by the Office of Research and Graduate Programs. During the initial semester, the curricular requirements of the program must be worked out with a supervisory committee of at least three faculty members. The Chair, as well as the majority of the Committee, must be members of the Graduate Faculty.

All departments or programs in which the student proposes to take more than 3 hours of graduate course work must offer degrees through the Graduate School; and, before submitting a program proposal, the student must have the permission of the department or program to take those courses.

Program Proposal

In addition to the above stipulations regarding constituent departments or programs, each interdisciplinary degree program must meet specific criteria as follows:

1. An overall minimum of 30 semester hours at 500 or 600 level.
2. A thesis (maximum of 6 hours for thesis in a 30-hour program). Interdisciplinary students must enroll in GS 699 for thesis credit.
3. At least one-half of the non-thesis, non-practicum, non-internship credit hours must be at the 600 level.
4. A minimum of 6 hours of 600-level course work must be taken in each of at least two departments or programs offering degrees through the Graduate School.
5. No single department or program may offer more than half the total number of credit hours required by the program.
6. Exclusive of thesis credit, no more than 6 hours may be taken in courses of the independent-study or practicum type; such course work may not be counted toward criteria specified in 3 or 4.
7. Courses designated as fulfilling degree requirements must be offered with sufficient frequency to permit the student to complete degree requirements within a reasonable time (two years for a 30-hour program).
8. The proposed curriculum must be submitted on the appropriate form, with approval signatures of at least three faculty members.
9. Requests for approval of substitutions or alternate courses must be submitted in writing to the Director of Interdisciplinary Studies in the Office of Research and Graduate Programs.

Upon receipt by the Graduate School, the program proposal will be reviewed and will be approved, provided that it meets the criteria stated above. The student will be notified of its approval by receiving a signed copy.

Only after the proposal has been approved and all necessary permissions from academic units have been received, will the student be fully admitted to the program in interdisciplinary studies. Admission is conditional until that time.

Requests for further information or assistance should be addressed to:

Dean of the Graduate School
University of Louisville
Louisville, Kentucky 40292

Justice Administration

Faculty

Chair
Deborah G. Wilson, Professor, Graduate Coordinator

Professors
B. Edward Campbell, Emeritus
J. Price Foster
Ronald M. Holmes
John C. Klotter, Emeritus
Gennaro F. Vito

Associate Professors
Terry D. Edwards
Elizabeth L. Grossi
Richard A. Tewksbury
William F. Walsh

Assistant Professor
Thomas Whetstone

Introduction

The goals of the Department of Justice Administration are for students to achieve a sound liberal arts education and a specialized understanding of the criminal justice system, criminal behavior, legal processes and the relationship of these phenomena to society.

Graduate studies in the Department of Justice Administration provide students with advanced social and behavioral science skills as well as a detailed and thorough understanding of crime, criminal justice and related processes. Graduates of this program are prepared to continue advanced studies in criminal justice or other social sciences and to assume mid and upper-level leadership positions within criminal justice programs and agencies.

The interdisciplinary nature of the program maintains the dynamic posture that allowed this crime related discipline to emerge and to mature quickly and successfully. Graduate students are given latitude in choosing elective courses in the Master of Science in the Administration of Justice. Elective courses related to the student's program of study are selected from the resources of the entire University. Courses in social work, public administration, law, business, and the various departments of the College of Arts and Sciences are possible electives that the student and his or her advisor may consider. With proper selection, the electives can complement the core criminal justice courses and produce a balanced, interdisciplinary program which is tailored to meet specific professional and career goals.

The combination of three elements, the degree programs, the Southern Police Institute and the National Crime Prevention Institute, makes the program in Justice Administration a unique blend of theory and practice.

- The Southern Police Institute, one of the oldest, most respected police management and administration educational programs in the United States.
- The National Crime Prevention Institute, the only center in the country devoted to training and educating crime prevention and loss prevention specialists and managers.

Admissions
Anyone seeking admission to the Graduate School, University of Louisville, for purposes of pursuing the Master of Science in the Administration of Justice must provide the following:

- Transcripts of all undergraduate and graduate work completed. The minimum requirement for admission is the Baccalaureate degree or its equivalent.
- Two letters of recommendation from individuals who can speak to the applicant's academic or professional capabilities.
- Scores on the General Test Section of the Graduate Record Examination (GRE).
- An original essay identifying the applicant's background, professional interests and goals. The essay should be 300-500 words and should allow the faculty to better understand the applicant's motivation and potential for graduate work.
- Completed application form for admission to the Graduate School, University of Louisville.
- $25.00 application fee, check or money order made payable to the University of Louisville.

The faculty in Justice Administration consider applications and supporting materials and recommend a disposition. The minimum requirements for unconditional admission to degree status are a grade point average of at least 2.75 on a 4-point scale in senior-college courses and at least 900 on the combined verbal and quantitative scores of the GRE as well as a positive evaluation of the letters of recommendation and the essay. In some instances students who fail to meet all requirements may be granted conditional admission.

Master of Science in Administration of Justice

Major: MS
Degree: ADJ
Unit: GA

General Requirements
The general requirements for the Master of Science degree in the Administration of Justice are completion of at least 30 semester hours of graduate level courses and a thesis for a total of 36 credit hours. At least a 3.0 grade average must be maintained for all graduate coursework. Core or specific courses required for graduation total 15 semester hours with the remaining courses being electives. The composition of the list of elective courses will vary from student to student depending on the student's undergraduate major, aspirations and background.

This degree is also offered in an intensive schedule similar to the executive formats of other disciplines. During a five-week period each summer, the school will offer three graduate courses resulting in a total of 9 semester hours of graduate study. New and continuing graduate students can complete the degree in three summers with an additional course, transfer credit or an independent study and the thesis.

	Semester Hours	Total
Required Core Courses		
JA 621, The Criminal Justice System	3	
JA 625, Legal Aspects of Criminal Justice Management	3	
JA 643, Theories of Crime and Delinquency	3	
JA 649, Applied Statistics in Criminal Justice	3	
JA 650, Research Methods in Criminal Justice	3	15
Recommended Electives (to be approved by advisor)		15
Thesis		
JA 699, Thesis	6	6
Minimum Total		**36**

Linguistics

Master of Arts in Linguistics

Major: LING
Degree: MA
Unit: GA

Director
Howard B. Altman (Classical & Modern Languages)

Program Committee:
Robert H. Kimball (Philosophy)
Frank Nuessel (Classical & Modern Languages)
Robert N. St. Clair (English)

General Information

The College of Arts and Sciences of the University of Louisville, through the Graduate School, offers a Master of Arts in linguistics. Since the study of language draws upon the perspectives of many different disciplines, linguistics courses are interdisciplinary in nature, and a student's course of study may include courses offered in many different departments. With the approval of the program director, some of these courses may be included in the program.

Program

The M.A. in Linguistics degree requires a minimum of 30 graduate hours. Exclusive of thesis credits, 15 hours must be at the 600-level. There is a non-thesis option.

Core Courses	**Semester Hours**
518, Foundations of Language	3
524, Psycholinguistics	
or 680, Seminar in Linguistics	3
603, Theories of Grammar	3
606, Historical/Comparative Linguistics	3
620, Phonetics and Phonology	3
621, Sociolinguistics	3

Electives
Students concentrate in Applied Linguistics/Teaching of English to Speakers of Other Languages. For specific requirements, contact the program director. With approval of the program director, electives are usually chosen from among the following areas:

Other linguistics courses
Education and Foreign Language Education
English language and literature
Modern languages and literatures (French, German, Spanish, Modern Languages)
Philosophy
Psychology
Sociology

Thesis Option
Students must complete core courses, 699, Thesis, and elective courses for a minimum total of 30 graduate hours.

Non-Thesis Option
Students must complete core courses and elective courses for a minimum total of 30 graduate hours.

Mathematics

Master of Arts in Mathematics

Major: MATH
Degree: MA
Unit: GA

Faculty

Chair
Michael S. Jacobson, Professor

Professors
Roger H. Geeslin, Emeritus
Thomas M. Jenkins
Lael F. Kinch
Lee Larson, Director of Graduate Studies
Robert B. McFadden
F. R. McMorris, University Scholar
Lois K. Pedigo, Emerita
Leland L. Scott, Emeritus
William H. Spragens, Emeritus
W. Wiley Williams

Associate Professors
George R. Barnes
Patricia B. Cerrito
Udayan B. Darji
Richard M. Davitt
Ewa Kubicka
Grzegorz Kubicki
Inessa Levi
Krzysztof M. Ostaszewski
Prasanna Sahoo
Steven Seif
Wei-Bin Zeng

Assistant Professors
Mary E. Bradley
Andre E. Kezdy
Jen Lehel
Robert C. Powers
Thomas Riedel
Chi Wang

Adjunct Professor
Stephen W. Looney

Prerequisites:
Undergraduate coursework equivalent to a major in mathematics from an accredited university. This should include a one-year course in either analysis or abstract algebra, equivalent to Mathematics 501-502 and 521-522 at the University of Louisville. Candidates who have not taken both must complete the second in their M.A. program.

Degree Requirements:
1. Candidates must complete a program of study approved by the department. All courses (up to a maximum of 12 semester hours) to be taken outside the Department of Mathematics must have prior departmental approval.
2. All students must complete a minimum of 30 semester hours of non-thesis graduate credit, including at least 15 semester hours in the Department of Mathematics, with one full-year sequence, in courses numbered 601 through 689.
3. Students must satisfy one of the following two requirements:
   a.(Examination Option): Pass written examinations in three areas of mathematics chosen from a list prepared by the department. At most two attempts are allowed. Examinations will be approved and administered by the departmental Graduate Studies Committee.
   b. (Thesis Option): Write a thesis on an advanced topic in the mathematical sciences. A total of two full-year sequences among courses numbered 601 through 689 must be completed.
4. Students choosing the Thesis Option must pass a final oral examination described under "Requirements for the Master's Degree" in the General Information section of the Graduate School Catalog.
5. All students must demonstrate proficiency in communication of mathematics.

Mechanical Engineering

Master of Science in Mechanical Engineering

Major: ME
Degree: MS
Unit: GS

Faculty

Chair
Glen Prater, Associate Professor

Professors
W. Geoffrey Coburn
Michael L. Day
Harry G. Schaeffer
Julius P. Wong

Associate Professors
Timothy E. Dowling
William P. Hnat

Assistant Professors
Ellen G. Brehob
Robert S. Keynton
Peter M. Quesada
Mark W. Steiner

Emeritus Professors
Hsing Chuang
Robert L. Collins
John B. Dressman
George C. Lindauer
Thomas E. Mullin
Robert E. Stewart

Programs

The Department of Mechanical Engineering of the Speed Scientific School, the school of engineering and applied science of the University of Louisville, offers a program of study leading to the degree of Master of Science. It also offers an integrated five-year program of cooperative education leading to the professional degree of Master of Engineering (described in the Speed Scientific School Catalog).

Admission
Applicants for admission to the M.S. program in Mechanical Engineering should have a baccalaureate degree in Mechanical Engineering or a related discipline, with a GPA of 2.75/4.0 or better. Unconditional admission requires a composite score (verbal and quantitative) of no less than 1100 on the Graduate Record Examination (1500 preferred). International students must show proficiency in English by scoring 550 or higher on the TOEFL (Test of English as a Foreign Language) examination, or by completing the University's Advanced Level of the Intensive English as a Second Language Program. An applicant not meeting a single requirement, but with otherwise acceptable credentials, may be admitted on a conditional basis. New students will not normally be considered for financial aid until after one semester of residency.

Advising
Upon enrollment, a student will be advised by the Department's M.S. academic advisor. After completing at least 12, but not more than 18 semester hours of graduate work, a permanent thesis advisor must be chosen by the student and approved by the Department Chair. During the semester following the selection of the permanent advisor, the student and thesis advisor should select the remaining two members of the thesis committee from among the graduate faculty, one of whom must be from outside the Mechanical Engineering Department.

	Semester Hours	Total
Courses in Major		
ME 600-level (graduate only) courses (in addition to thesis)	9	
ME electives 500-600 level	6	
ME 690, thesis	6	
Courses Outside of Major		
Non-ME electives (500-600 level)[1]	9	
Minimum Total[2]		**30**

1. Non-mechanical engineering electives must be approved by student's advisor. These courses usually lie in mathematics, computer science or another engineering discipline.
2. A minimum of 12 hours of coursework, exclusive of thesis hours, must be taken at the 600-level.

Microbiology and Immunology

Doctor of Philosophy in Microbiology and Immunology

Major: MBIO
Degree: PHD
Unit: GM

Faculty

Acting Chair
Robert D. Stout, Professor

Professors
Ronald J. Doyle
Robert D. Higginbotham, Emeritus
Pinghui Victor Liu, Emeritus
Uldis N. Streips

Associate Professors
Faye E. Austin
Lawrence A. Hunt
Paul B. Johnston
David E. Justus
Kenneth F. Keller, Emeritus
Girish J. Kotwal
Richard D. Miller

Joint Professor
Gordon D. Ross, Professor of Pathology and Laboratory Medicine

Joint Associate Professors
Gabino R. Fernandez-Botran, Associate Professor of Pathology and Laboratory Medicine
Martin J. Raff, Professor of Medicine
Robert H. Staat, Professor of Biological and Biophysical Sciences, Dentistry

Associates
William G. Cheadle, Associate Professor of Surgery
Jon B. Klein, Professor of Medicine
Gary S. Marshall, Associate Professor of Pediatrics
James W. Snyder, Professor of Pathology and Laboratory Medicine (Clinical Service)
James T. Summersgill, Associate Professor of Medicine (Clinical Service)
Samuel R. Wellhausen, Associate Professor of Pathology and Laboratory Medicine (Clinical Service)
Lung T. Yam, Professor of Medicine

Admission Requirements

The Department of Microbiology and Immunology, in the School of Medicine, offers programs of study leading to the degrees of Doctor of Philosophy and Master of Science. For admission to the Ph.D. or M.S. program, the applicant must have attained the B.S or B.A. degree with a minimum grade-point average of 3.0 (on a 4.0 point scale). The scores of the General Test Section of the Graduate Record Examination and the TOEFL (where applicable), official transcripts of all undergraduate and graduate course work, three letters of recommendation, and a short biographical sketch are required.

The applicant must meet the other general requirements of the Graduate School as outlined in the General Information section of this catalogue. The application deadline for early consideration is December 15th. February 1st is the final application date.

The applicant is expected to have completed the following: One year of introductory biology, one year of organic chemistry, one year of physics, one semester (or equivalent) of introductory calculus, and one semester (or equivalent) of quantitative analysis/or biochemistry/or molecular biology.

Qualified prospective students will be invited for a personal interview with the Department. Certain foreign students may request a waiver.

The minimum requirements for this degree, beyond those listed in the General Information section of this catalogue include:

BIOC 647, Graduate Biochemistry II (4)
or BIOC 640, Dental Biochemistry (4)
BIOC 668, Molecular Biology (4)
MBIO 600, Special Projects in Microbiology (2)
MBIO 601, Medical Microbiology (8)
MBIO 606, Seminar (3)
MBIO 658, Cellular and Molecular Immunology (3)
MBIO 667, Advanced Cell Biology (3)
MBIO 670, Molecular Virology (3)
MBIO 680, Microbial Genetics (3)
MBIO 685, Microbial Physiology (3)
MBIO 687, Microbial Pathogenesis (3)

Upon completion of the required course work with a 3.0 or higher GPA (with a grade no lower than a B- in MBIO 601) and upon the recommendation of the advisor or chair, the student may take the Ph.D. Qualifying Examination. The Qualifying Examination will be given at the end of the second year of graduate study and will consist of written examinations in five areas of microbiology and immunology, followed by an oral defense of the written answers. The examinations will be primarily based upon the knowledge and understanding gained in the advanced graduate courses (MBIO 658, 670, 680, 685, and 687).

Dissertation Research
The student will decide on a research project after consultation with his/her dissertation advisor. The candidate will formulate a dissertation committee composed of the dissertation advisor, three graduate faculty members of the Department of Microbiology and Immunology and one additional graduate faculty member from another department. The Department Chair will serve as a regular or ex-officio member of all student dissertation committees. This committee shall consist of no fewer than five voting members and the composition of the committee must be approved by the Graduate Dean.

All Ph.D. candidates will prepare a research proposal in the format of an NIH grant application. This research proposal, with any revisions required by the dissertation committee, should be approved by the middle of the third year of graduate study.

The committee will continue to meet at regular intervals to evaluate progress of the research. When the dissertation research has been completed, the committee is to administer the final oral examination in accordance with the guidelines set forth in the General Information section of this catalogue. This defense of the dissertation is announced by the Dean of the Graduate School and may be attended by all interested graduate faculty members in addition to the committee and the faculty of the Department of Microbiology and Immunology.

Master of Science in Microbiology and Immunology

Major: MBIO
Degree: MS
Unit: GM

	Semester Hours	Total
Required Courses		
BIOC 640, Dental Biochemistry (4)		
or BIOC 647, Graduate Biochemistry II (4)	4	
MBIO 601, Medical Microbiology	8	
MBIO 606, Seminar	2	
One of the following advanced courses (3 credit hours) must be selected:		
MBIO 658, Cellular and Molecular Immunology	3	
MBIO 670, Molecular Virology	3	
MBIO 680, Microbial Genetics	3	
MBIO 685, Microbial Physiology	3	
MBIO 687, Microbial Pathogenesis	3	
MBIO 619, Research		
or MBIO 620, Thesis	12	
Minimum Total		**29**

If the student has satisfactorily completed the required courses and total credit hour requirements with an overall & program GPA of 3.0 (with a grade no lower than a B- in MBIO 601), then the student may register as an M.S. candidate.

A written thesis, based upon the research of the student within the department, will be required for the M.S. degree. The student and the advisor should choose at least two graduate faculty members, one of whom must be from a different department, to serve as a supervisory committee. The student's advisor shall serve as chair of the committee and the department chair as a regular or an ex-officio member. The committee shall have no less than three voting members and the composition of the committee must be approved by the Graduate Dean.

This committee shall approve the student's proposed research program and serve as the official final examination committee.

The final examination will be primarily concerned with the thesis. Evaluation of student competence and thesis acceptability, together with departmental recommendations for graduation, will be sent to the Dean of the Graduate School for appropriate action.

Music and Music History

Faculty

Professors
Jack Ashworth
Jerry W. Ball, Dean Emeritus
Doris Owen Bickel, Emerita
Paul R. Brink
Jean Christensen, Chair - Music History
Richard L. Cryder
Anne Marie deZeeuw, Chair - Music Theory and Composition
Melvin D. Dickinson
Donn Everette Graham
Gerhard Herz, Emeritus
Brenda E. Kee, Chair - Keyboard and Vocal Performance
Herbert Koerselman, Dean - School of Music
Lee Luvisi, Artist-in-Residence
Ernest E. Lyon, Emeritus
Peter McHugh, Chair - Instrumental Performance
Naomi Oliphant, Associate Dean
Acton Ostling, Jr.
Edith Davis Tidwell
Michael H. Tunnell
Loren R. Waa, Chair - Music Education
Robert Weaver, Emeritus

Associate Professors
Steven Rouse
Frederick Speck, Director of Bands
Marc Satterwhite

Assistant Professor
Kent Hatteberg, Director of Choral Activities

Adjunct Professor
Wesley K. Morgan, Emeritus

Graduate Programs

The School of Music offers training toward three specific master's degrees: Master of Music, Master of Music Education and the M.A. in Music History. The Doctor of Philosophy in Musicology is offered jointly with the University of Kentucky. Major subjects in the Master of Music curriculum are applied music, music history, or theory-composition. The Master of Music Education program allows an applied music minor in instrument or voice. The music history and theory departments offer basic instruction for all students at the undergraduate level as well as advanced study for those wishing to pursue undergraduate and graduate work in these fields.

Master's Degrees

Admission Requirements
In addition to the general requirements for admission to the Graduate School, the following specific requirements must be met:

1. To be admitted to the Graduate Division of the School of Music, the applicant should possess a baccalaureate degree in the area (or an equivalent one) to be pursued in advanced studies.
2. Applicants must meet the specific entrance requirements established by the major department.
3. Applicants are required to take entrance examinations in music history, literature and theory. Students may be required to take, without credit, courses in which they are deficient as indicated by the examination results. All full-time students are required to enroll in Music Bibliography and Research Methods (MUS 607), within their first two semesters of graduate work. Part-time students must enroll in MUS 607 before registering for more than 10 hours of graduate work.

The School of Music provides each student with guidelines to assist in preparation for the entrance exams and a copy of the Handbook for Graduate Music Students. Students are expected to read the School of Music Handbook and the University Graduate Catalog and to follow regulations and procedures regarding their specific degree program at the University of Louisville. Graduate study in music begins with the preparation for the entrance examinations in Music History and Music Theory and concludes with the graduate oral exam that is taken when all requirements have been met.

General Requirements
In addition to the general degree requirements described in the General Information section of the Graduate Catalog, the following degree requirements must be met:

1. The student shall obtain permission from the Graduate Division Committee to begin work at the graduate level.
2. All students must qualify as candidates for the master's degree no later than the midterm of the second semester of full-time residence, or before 15 semester hours have been completed. (See catalog for distinction between admission to degree candidacy and registration in candidacy status.) To qualify for degree candidacy the student must have
   a. proof that all deficiencies in music history, literature and theory have been removed;
   b. an academic record with a minimum of 9 hours of graduate credit with a grade point average of 3.0;
   c. an inclusive program of studies fulfilling the requirements of a master's curriculum, approved by the major professor and the departmental chairperson;
   d. in the case of a program requiring a master's thesis or professional paper, a proposed topic for the thesis or paper and a proposed membership for a reading committee to provide guidance during the writing of the thesis or paper. (See requirement 6 below).
3. The minimum amount of credit earned by the candidate in courses shall be 26 semester hours exclusive of the thesis or any special courses preparatory for it.
4. Graduate students must have a 3.0 grade point average in order to receive a master's degree in music. No more than 6 hours with a grade of "C" will be accepted toward a degree and no grade of "C" will be accepted in a major subject.

5. Degree candidates in applied music are required to give a master's recital which normally takes place during a candidate's final semester of study. Preparation and presentation of the recital shall follow the guidelines in the Handbook for Graduate Students.
6. Degree candidates in music history or theory and composition are required to submit a thesis or major composition for evaluation by the reading committee. The guidelines concerning preparation, submission, and presentation of these projects are found in the Handbook for Graduate Students. Due dates are established with reference to the Schedule of Classes for the semester in which the project is to be completed.
7. All students are required to pass an oral examination given by the Graduate Committee at least ten days before the end of the semester in which the degree is to be granted and may cover all areas of endeavor undertaken by the student in his graduate program or believed essential to the student's background.
8. A candidate who fails the oral examination at the end of a semester may not be given a second one before the regular time for such an examination at the end of the next semester or summer session. A candidate who fails in the second oral examination shall not be granted the degree of M.M., M.A. or M.M.Ed. from this University.
9. Full-time students are required to participate without credit in a major ensemble appropriate to the student's major or principal instrument. Keyboard majors or principals may satisfy this requirement by participation in chamber ensembles.

Master of Music in Music Performance

Major: MUSP
Degree: MM
Unit: GU

Prerequisites
Bachelor of Music degree or equivalent.

Demonstration, by examination, of skills and capacities in the following fields:
Written, aural, and keyboard harmony;
Melodic, harmonic, and rhythmic dictation; sightsinging;
Elementary counterpoint;
History and literature of music, and analytic understanding of musical forms and genres.

Audition in major field, demonstrating a level equivalent to the completion of the appropriate Bachelor of Music degree. Students intending to major in voice must have a reading knowledge of one foreign language and satisfactory diction in two others.

Curriculum	Semester Hours	Total
Music Bibliography and Research Methods	3	
Major Applied Field (MUS 603, 604, 613)	12	
Music History Seminar (600 level)	3	
Music Theory (500 or 600 level)	4	
Major Subject and Electives*	8	
Minimum Total		**30**

Other Requirements
Students are expected to present a public recital that comprises no less than sixty minutes of music and follows the guidelines governing public recitals. Normally this takes place during the candidate's final semester. Full-time students are required to participate in one ensemble each semester.

* The major subject requirement can be satisfied with such courses as pedagogy and literature; additional study in the major applied field or ensembles will not meet this requirement. Piano and vocal majors should complete a total of 4 hours of pedagogy and/or literature directly related to their applied major. Piano majors with a concentration in piano pedagogy are required to take advanced piano pedagogy (MUS 671-672), and their graduate recital may include chamber music.

Master of Music in Music Performance With Concentration in Instrumental Conducting

Major: MUSP
Concentration: COND
Degree: MM
Unit: GU

Prerequisites
Bachelor of Music degree or equivalent.

Demonstration of skills and capacities by examination in the following fields:
- Written, aural, and keyboard harmony;
- Melodic, harmonic, and rhythmic dictation; sightsinging;
- Elementary counterpoint;
- History and literatuare of music, and analytic understanding of musical forms and genres.

Audition in major field, demonstrating a level equivalent to the completion of the appropriate Bachelor of Music degree.

Curriculum	Semester Hours	Total
Bibliography and Research Methods	3	
Major Applied Field (MUS 601, 602, 611)	6	
Seminar in Conducting (MUS 659, 600)	4	
Instrumental Conducting and Score Reading (MUS 559)	2	
Music History Seminar (600 level)	3	
Music Theory (500 or 600 level)	4	
Music Electives*	8	
Minimum Total		**30**

Other requirements
Students are expected to present a conducting recital, normally during the candidate's final semester. Full-time tudents are required to participate in one ensemble each semester.

* To be chosen from courses in pedagogy, literature, or the student's principal applied instrument.

Master of Music in Music Performance With Concentration in Choral Conducting

Major: MUSP

Concentration: COND
Degree: MM
Unit: GU

Prerequisites
Bachelor of Music degree or equivalent.

Demonstration of skills and capacities by examination in the following fields:
- Written, aural, and keyboard harmony;
- Melodic, harmonic, and rhythmic dictation; sightsinging;
- Elementary counterpoint;
- History and literature of music, and analytic understanding of musical forms and genres.

Audition in major field, demonstrating a level equivalent to the completion of the appropriate Bachelor of Music degree. Students intending to major in voice must have a reading knowledge of one foreign language and satisfactory diction in two others.

Curriculum	Semester Hours	Total
Music Bibliography and Research Methods	3	
Major Applied Field (MUS 601, 602, 611)	6	
Seminar in Conducting (MUS 659, 600)	4	
Instrumental Conducting and Score Reading (MUS 559)	2	
Choral Literature	4	
Music History Seminar (600 level)	3	
Music Theory (500 or 600 level)	4	
Electives*	4	
Minimum Total		**30**

Other requirements:
Students are expected to present a conducting recital, normally during the candidate's final semester. Full-time students are required to participate in one ensemble each semester.

* To be chosen from courses in pedagogy, literature, or the student's principal applied instrument.

Master of Music in Music Performance With Concentration in Piano Pedagogy

Major: MUSP
Concentration: PPED
Degree: MM
Unit: GU

Prerequisites
Bachelor of Music degree, or equivalent.

Demonstration of skills and capacities by examination in the following fields:
Written, aural, and keyboard harmony;
Melodic, harmonic, and rhythmic dictation; sightsinging;
Elementary counterpoint;
History and literature of music, and analytic understanding of musical forms and genres.

Audition in major field, demonstrating a level equivalent to the completion of the appropriate Bachelor of Music degree.

Curriculum	Semester Hours	Total
Music Bibliography and Research Methods	3	
Piano Pedagogy (MUS 571, 572, 671, 672)	8	
Major Applied Field (MUS 601, 602, 611)	6	
Piano Literature (MUS 561 or 562)	4	
Music History Seminar (600 level)	3	
Music Theory (MUS 500 or 600 level)	4	
Music Electives*	4	
Minimum Total		**32**

Other Requirements
Students are expected to present a master's recital, normally during the candidate's final semester. Full-time students are required to participate in one ensemble each semester.

* To be chosen from courses in pedagogy, literature, or the student's principal applied instrument.

Master of Music in Music History

Major: MUHM
Degree: MM
Unit: GU

Prerequisites
Bachelor of Music or equivalent

Reading ability in one foreign language (preferably German, French, or Italian) demonstrated by examination administered in cooperation with the Modern Languages Department (fee $20.00). The examination must be passed before the student is admitted to candidacy.

A paper submitted to the Department of Music History demonstrating ability to write proficiently and to do elementary research.

Demonstration or skills and capacities by examination in the following fields:
Written, aural, and keyboard harmony:
Melodic, harmonic, and rhythmic dictation; sightsinging;
Elementary counterpoint;
History and literature of music, and analytic understanding of musical forms and genres.

Completion of the entrance examination in music history with an average score of 70 required for admission to the music history curriculum.

Curriculum	Semester Hours	Total
Music Bibliography and Research Methods	3	
Music History Seminars	9	
Music Theory (Schenkerian Analysis, MUS 651)	3	
Music Theory (20th-Century Analysis, MUS 653)	3	
Applied Music (chosen from major and minor fields, including conducting)	4	
Ensemble (Early Music Ensemble, or 20th-Century Ensemble)	3	
Electives	3	
Thesis	4	
Minimum Total		**32**

Note: Students will normally complete the master's thesis in their final semester. Guidelines and a general calendar for preparation, submission and presentation are found in the Handbook for Graduate Students.

Master of Music in Theory and Composition

Major: MUST
Degree: MM
Unit: GU

Prerequisites
Bachelor of Music or equivalent.

Demonstration of skills and capacities by examination in the following fields:
- Written, aural, and keyboard harmony;
- Melodic, harmonic, and rhythmic dictation; sightsinging;
- Elementary counterpoint;
- History and literature of music; and, analytical understanding of musical forms and genres.

Original works submitted to the Department of Theory and Composition to indicate ability and technical facility in the field of composition.

Candidates should have a thorough and practical knowledge of piano. A thorough knowledge is needed also in the areas of string, brass and woodwind instruments.

Curriculum	Semester Hours	Total
Music Bibliography and Research Methods	3	
Music Theory	8	
Advanced Private Composition	6	
Music History Seminar	3	
Electives*	6	
Thesis or Compositon	4	
Minimum Total		**30**

Other Requirements
Full-time students are required to participate in one ensemble each semester.

Note: Students will normally present a master's thesis or an original composition in their final semester. Guidelines and a general calendar for preparation, submission and presentation are found in the Handbook for Graduate Students.

* Subject to approval of the department faculty.

Master of Music Education

Major: MUED
Degree: MME
Unit: GU

Prerequisites
B.M. Ed. degree or equivalent.

Classroom teaching experience (prior to, or concurrent with, graduate study and exclusive of practice teaching).

Demonstration of skills and capacities by examination in the following fields:
- Written, aural, and keyboard harmony;
- Melodic, harmonic, and rhythmic dictation; sightsinging;
- Elementary counterpoint;
- History and literature of music and analytic understanding of music forms and genres.

Curriculum	Semester Hours	Total
Music Bibliography and Research Methods	3	
Music Education and Related Courses	14-16	
Applied Music (chosen from major or minor performance fields, including conducting)	6-10	
Music History and Theory	3-6	
Thesis*	4	
Minimum Total		**30**

* Students are required to prepare either a thesis (4 semester hours of credit) or a professional paper (without credit). In the latter case, 4 hours of coursework will be determined by the student and graduate advisor in order to achieve the 30-hour minimum requirement.

Master of Arts in Teaching in Music Education (Certification in Vocal or Instrumental Music K-12)

Major: EDMU
Degree: MAT
Unit: GE

Prerequisites
Admission to Graduate School

Admission to Teacher Education

Completion of the Pre-Teacher Education Core (EDUC 506)

Successful musical audition

Curriculum	Semester Hours	Total
Pre-Student Teaching (MUED 605):		
Orientation and General Methods (Vocal)		
or Pre-student Teaching (MUED 606):		
Orientation and General Methods (Instrumental)	3	
Case Studies in Music Education (MUED 628)	2	
Music Education I (MUED 629)	2	
Music Education II (MUED 630)	2	
Gordon Music Learning Theory (MUED 639)	2	
Applied Music (MUED 611)		
or Conducting (MUS 659)	2	
Applied Music (MUED 612)		
or Conducting (MUS 660)	2	15
Exit Requirement		
Student Teaching Seminar (MUED 607)	2	
Student Teaching Seminar (MUED 608)	2	
Capstone Seminar (MUED 609)	3	
Music Student Teaching:		
Elementary/Secondary I (MUED 610)	4	
Music Student Teaching:		
Elementary/Secondary II (MUED 611)	4	15
Minimum Total		**30**

Master of Arts in Music History

Major: MUHM
Degree: MA
Unit: GU

Prerequisites
Bachelor of Arts in Music or Music History, Bachelor of Music, or equivalent.

Twelve semester hours in music history at the undergraduate level, three hours of which may be taken for undergraduate credit concurently with initial graduate study.

Reading ability in one foreign language (preferable German, French, or Italian) demonstrated by examination administered in cooperation with the Modern Languages Department (fee $20.00). The examination must be passed before the student is admitted to candidacy.

A paper submitted to the Department of Music History demonstrating ability to write proficiently and to do elementary research.

Demonstration of skills and capacities by examination in the following fields:
- Written, aural, and keyboard harmony;
- Melodic, harmonic, and rhythmic dictation; sightsinging;
- Elementary counterpoint;
- History and literature of music, and analytic understanding of musical forms and genres.

Completion of the entrance examination in music history with an average score of 70 required for admission to the music history curriculum.

Curriculum	Semester Hours	Total
Music Bibliography and Research Methods	3	
Music History Seminars	9	
Humanities Courses (500 or 600 level)	6	
Foundations of Music Theory	3	
Music Electives	5	
Ensemble (Early Music or 20th Century)	2	
Thesis	4	
Minimum Total		**32**

Note:
By the end of the first semester in residence, the student, in consultation with the graduate advisor, will have developed a program of studies to be submitted to the faculty of the Department of Music History for approval.

Students are expected to present a master's thesis normally in their final semester. Guidelines and a general calendar for preparation, submission and presentation are found in the Handbook for Graduate Students.

Doctor of Philosophy in Musicology

Historical musicology is a humanistic discipline dedicated to the discovery, correlation, appraisal, and exposition of musical concepts. In order to communicate ideas through publications, teaching and performance, the musicologist employs skills developed in applying research methods and techniques, writing, musicianship and musical analysis.

The degree of Doctor of Philosophy is granted by the University of Kentucky at Lexington, Kentucky, with residence at the University of Louisville. The faculties and facilities of both universities are available to students.

Prerequisites for Admission
Every applicant must apply, pay application fees, and be admitted to the Graduate Schools of both the University of Louisville and the University of Kentucky. The admission applications of both institutions should be sent to the respective admissions offices. Copies of all necessary documents (transcripts, Graduate Record Examination scores, letters of recommendation, and writing samples) should be sent to the Director of Graduate Studies, School of Music, University of Louisville, who will forward copies to the Director of Graduate Studies, School of Music, University of Kentucky.

Master of Music or Master of Arts in music or music history, Bachelor of Music (or equivalent).

Demonstration of skills and capacities by examination in the following fields:

Written, aural, and keyboard harmony;
Melodic, harmonic, and rhythmic dictation; sightsinging;
Elementary counterpoint;
History and literature of music and analytic understanding of music forms and genres.

Admission to Full Graduate Standing
All applicants must provide evidence of competence in research and writing. Those applicants holding or earning a baccalaureate degree should present at least one term paper or the equivalent, such as the senior honors thesis. Applicants with a master's degree must submit the M.A. thesis. If the applicant has not completed a master's degree thesis, paper(s) of acceptable scope and quality, and a major research project undertaken as part of work done at the University of Louisville or the University of Kentucky, must be submitted by the end of the first semester of study.

An applicant may be admitted to full graduate standing in the Ph.D. program after (1) completion and acceptance of the major research project in lieu of the master's thesis, if this requirement is applicable; (2) satisfactory completion of at least 9 hours of course work at or above the 600 level, including at least one seminar or special course in musicology; (3) satisfactory completion of a proficiency examination in one of the required foreign languages (see below for language requirement); and (4) meeting the requirements of the Graduate School for admission to full graduate standing, including the removal of all deficiencies in music history, literature, and theory revealed by the graduate entrance examinations.

Admission to full graduate standing must normally be achieved no later than midterm of the third semester. The applicant may be permitted to register for a fourth semester if full graduate standing has not been attained. The formation of the doctoral committee will normally take place at the time full graduate standing is achieved.

A program of study must be approved by the doctoral committee.

Language Requirements
The foreign languages required for the Ph.D. in musicology are German and either French or Italian, and any other languages required for preparing the dissertation.

All students must take a proficiency examination, as described below, in one foreign language before or during the first month of residence. If the examination is failed, it must be retaken successfully by the midterm of the second semester of residence.

An examination in a second language (and third, if required by the dissertation committee) must be taken prior to the preliminary examinations. This examination may be repeated once.

Each language examination will be given according to the following format:

Part 1: One or more passages from a musicological book or article, previously unseen by the student, and having a combined total of approximately 300 words will be translated. Use of a dictionary will be allowed.

Part 2: The student will submit, prior to the examination, an article of twenty to fifty pages for approval by a member of the Music History faculty conversant with the language. After an appropriate period of preparation, the student will translate without the use of a dictionary a passage of approximately 500 words chosen by a faculty member of the Department of Classical and Modern Languages.

The time allowed for each part will be limited to two hours. The examination will then be graded as acceptable or unacceptable by two faculty members, one each from the Music History faculty and the Department of Classical and Modern Languages.

Candidates for degrees must be proficient in English.

Course Requirements
Courses taken in musicology should include a representative distribution of both period and literature courses; all periods of music history should be represented. A minimum of three courses taught by faculty members of the University of Kentucky on either campus is required.

Residence Requirement
In addition to meeting other residence requirements of the University of Louisville, a doctoral student in musicology 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. Courses taken at the University of Kentucky are accepted in fulfillment of residence at the University of Louisville.

Admission to Doctoral Candidacy
The applicant must pass comprehensive preliminary examinations, oral and written, in order to be admitted to candidacy. These qualifying examinations are to be taken preferably no later than one semester after completion of course work. Eligibility for the examination will be attained only after the completion of required course work, the satisfactory completion of two semesters of residency, and the satisfaction of the language requirement.

Students must be registered in the semester in which they take their qualifying examinations. Those who are not registered for courses, must register in one of the following ways:

If registering at the University of Louisville, students must register for Doctoral Candidacy (DOCT 600) for each semester until graduation. At the University of Kentucky, students must register for two semesters of MUS 769 (9 hours each), after which they register for MUS 769 (0 hours, no fee) for each following semester until graduation.

Doctor of Philosophy in Musicology

Major: MUSC
Degree: PHD
Unit: GU

Course Requirements
Research Methods (Mus 618 at UK; Mus 607 at UL)

Notation
(Mus 701 at UK; Mus 583 at UL)

A minimum of six hours of graduate-level advanced analysis
(Mus 671-672 at UK; Mus 651 and 653 at UL)

A minimum of four seminars or special courses
(Mus 702 or 718 at UK; Mus 670, 680, or 685 at UL)

Music History, Collegiate Teaching Practicum (MUS 775-776)

A minor in a field related to musicology must be developed outside the School of Music. Normally this involves a minimum of three courses (500 or 600 level). Undergraduate courses needed by the student in order to participate in graduate level courses in the cognate field will be taken without credit toward satisfying program requirements. At the discretion of the student's special committee, the outside minor may be interdisciplinary.

Active participation (performing, editing, or both) in the Early Music Ensemble is strongly recommended for a minimum of two semesters.

Faculty

Professors
Paulette Adams
Ruth B. Craddock, Emerita
Linda H. Freeman
Marianne Hutti
Gail Mornhinweg
Mary H. Mundt, Dean, School of Nursing
Kay T. Roberts
Karen Robinson

Associate Professors
Suzanne H. Brouse
Patricia Lacefield
Rosalie O. Mainous
Vicki Hines-Martin
Cynthia McCurren
Deborah L. Scott, Associate Dean for Academic Affairs

Programs

The School of Nursing offers a Master of Science in Nursing that prepares nurses for advanced clinical practice with preparation as a nurse practitioner or clinical specialist. In addition, the program helps establish collaborative relationships between nurses and members of other health disciplines in education, research, and the delivery of health care.

The School of Nursing also offers a RN-MSN option for registered nurses with associate degrees or diplomas in nursing. Admission requirements for the combined RN-MSN option are essentially the same as the requirements for the MSN program. In addition, applicants must earn a grade of B or better in two approved graduate nursing courses. For additional information, call the Office of Student Services within the School of Nursing.

Admission
Students can be admitted to the program for the Fall, Spring or Summer (summer course offerings are limited) semester. Applications for each term will be reviewed, and students will be contacted regarding their recommended admission status within one month after the priority deadline.

Priority deadlines are:

Fall Semester	May 1
Spring Semester	October 1
Summer Semester	March 1

Application materials received after the priority deadline may not be processed in time for registration. Therefore, all applicants are strongly encouraged to apply before the priority deadline.

To be considered for admission to Degree Status, the following items must be submitted:

1. Transcript verifying completion of a state approved baccalaureate program in nursing, with a cumulative grade point average of at least 3.0 on a 4.0 scale, computed on upper division (last two years) courses.
2. Verbal, quantitative and analytic scores of 425 each on the Graduate Record Examination (GRE).
3. At least two letters of reference from individuals who can speak of academic and/or professional capabilities and potential.
4. Licensure or eligibility for licensure as a registered nurse in Kentucky.
5. Completed Applicant Data Sheet (available Office of Student Services, School of Nursing).
6. A personal interview with faculty may be required.
7. Completed UofL Graduate School Application (including $25 application fee).

Students who do not meet admission requirements may be considered for admission in Conditional status. They may, however, be considered for non-degree status. Students are allowed to take up to 6 credit hours in non-degree status. Priority enrollment in courses is given to graduate nursing students in Degree status.

Applications will not be considered for Full or Conditional Degree status until all materials are obtained.

Curriculum for MSN
The MSN requires a minimum of 45 semester hours, which may be completed in full-time or part-time study. Completion of a thesis or research project is required. Formal course offerings in the program are divided into two groups: core courses, which all students take, and the advanced nursing practice component.

At least one year of relevant clinical experience as a licensed registered nurse is required before beginning clinical courses.

Master of Science in Nursing

Major: NURS
Degree: MSN
Unit: GN

Core Courses	Semester Hours	Total
NURS 550 Foundations for Advanced Practice	3	
NURS 552 Health Care Systems	3	
NURS 647 Clinical Decision Making: Psychopathology	3	
NURS 649 Clinical Psychopharmacology	1	
PHAR 650 Advanced Nursing Pharmacology	3	
NURS 651 Nursing Research	4	
NURS 652 Statistics	3	
NURS 653 Advanced Practice Roles	3	
NURS 654 Informatics in Health Care	2	
NURS 655 Pathophysiology for Clinical Decision Making*	3	
NURS 656 Advanced Clinical Assessment* (includes 42 clinical hours)	3	
or NURS 648 Advanced Clinical Assessment: Psych-Mental Health Nursing	3	
or NURS 629 Neonatal Advanced Health Assessment (includes 21 hours lab and 42 hours clinical)	2.5	
NURS 657 Interventions for Health Promotion	3	
NURS 698 Research Project	2	
or NURS 699 Thesis	5	
5204-805 Embryology**	2	
5240-850 Genetics**	0.5	28-33

Advanced Nursing Practice Component:
(one of the following areas)

NURS 615 Advanced Clinical Practice: Women's Health NP (includes 560 clinical hours)	1-13
NURS 623 Advanced Clinical Practice Adult CNS (includes 336 clinical hours)	1-13
NURS 625 Advanced Clinical Practice: Adult NP (includes 560 clinical hours)	1-13
NURS 635 Neonatal NP: Clinical Management I-III (includes 21 clinical hours)	3-9
NURS 636 High Risk Clinical: Neonatal NP (includes 560 clinical hours)	2-8
NURS 645 Advanced Clinical Practice: Adult Psychiatric Mental Health CNS (includes 532 clinical hours)	1-13
Total	**45-49**

* Basic pathophysiology knowledge and physical/health assessment skills are necessary for successful progression in Advanced Pathophysiology and Health Assessment courses. The faculty strongly recommend formal basic courses or continuing education programs in pathophysiology and physical/health assessment as pre or corequisites to these advanced courses.

** Additional core courses for Neonatal NP track. Credit hours are subject to change. Based on current course offerings.

Post-Master's Nurse Practitioner and Clinical Nurse Specialist Options

Nurses who have already obtained a Master of Science in Nursing degree may apply to one of the Clinical Nurse Specialist or the Nurse Practitioner options as a non-degree student. These options are designed to prepare individuals to be eligible for the certification examinations for nurse practitioners or provide core content and minimal clinical hours for individuals wanting to eventually sit for CNS certification.

Admissions Requirements:

1. Graduation from a masters program in nursing.
2. Official degree-showing transcripts from BSN and MSN programs. Applicants with U of L degrees do not need to send official transcripts.
3. Current licensure as a registered nurse in Kentucky (submit copy of license).
4. A minimum of one year practice within the last three years in an area relevant to the selected nurse practitioner major.
5. Two letters of recommendation which address academic and professional competence.
6. Completion of Applicant Data Sheet (available at Dean's Office, School of Nursing).
7. Personal interview with faculty may be required.
8. Completed UofL Graduate School application (including $25 application fee).

Successful completion of the following courses meets the basic requirements for the practitioner examinations for Women's Health, Gerontology, and Adult:

	Semester Hours	Total
Advanced Nursing		
NURS 653 Advanced Practice Roles (waived for CNS)	3	
PHAR 650 Advanced Nursing Pharmacology	3	
* NURS 655 Pathophysiology for Clinical Decision Making	3	
* NURS 656 Advanced Clinical Assessment (includes 42 clinical hours)	3	12
Advanced Clinical Practice		
NURS 615, NURS 625, or NURS 665 (includes 560 clinical hours)	13	13
Total		**25**

* Basic pathophysiology knowledge and physical/health assessment skills are necessary for successful progression in Advanced Pathophysiology and Health Assessment courses. The faculty strongly recommend formal basic courses or continuing education programs in pathophysiology and physical/health assessment as pre or corequisites to these advanced courses.

For students interested in the Neonatal Nurse Practitioner, successful completion of the following courses meets the basic requirements for the Practitioner examination:

	Semester Hours	Total
Advanced Nursing		
NURS 629 Neonatal Advanced Health Assessment (includes 42 clinical hours and 21 hours lab)	2.5	
PHAR 650 Advanced Nursing Pharmacology	3	
NURS 653 Advanced Practice Roles	3	
5204-805 Embryology	2	
5240-850 Genetics	0.5	11
Advanced Clinical Practice		
NURS 635/NURS 636 (includes 560 hours clinical and 21 hours lab)	17	17
Total		**28**

Students interested in the Adult Psychiatric Mental Health CNS track must successfully complete the following courses:

	Semester Hours	Total
Advanced Nursing		
NURS 647 Clinical Decision Making: Psychopathology	3	
NURS 649 Clinical Psychopharmacology	1	
NURS 653 Advanced Practice Roles	3	
NURS 656 Advanced Clinical Assessment (includes 42 hours clinical)	3	
PHAR 650 Advanced Nursing Pharmacology	3	13
Advanced Clinical Practice		
NURS 645 Advanced Clinical Practice: Adult Psychiatric Mental Health CNS (includes 532 hours clinical)	13	13
Total		**26**

Occupational Training and Development

Faculty

Chair
Carolyn Rude-Parkins, Professor

Professors
Keith Bayne, Emeritus
Richard K. Crosby, Emeritus

Assistant Professors
Mike A. Boyle
Patricia K. Leitsch

Program

The Department of Occupational Training and Development offers the Master of Education degree. Various programs available to graduate students provide considerable flexibility to pursue expanded professional careers in training and development for students from business, industry, health care agencies, military or civil service and community agencies and organizations. Various certification and rank programs are available to students preparing for public school teaching and administration.

Master of Education in Occupational Education

Major: OE
Degree: MED
Unit: GE

	Semester Hours	Total
Basic Professional Courses		
EDFD 600, Introduction to Research Methods and Statistics	3	3
The student must choose, with the approval of the advisor, a course offered in the historical, sociological, or philosophical foundations of education, to be selected from among the following:		
EDFD 620, 625, 629, 630, 631, 640, 681	3	3
EDTD 610, Principles & Philosophy of Occupational Education	3	
EDTD 681, Research in Training and Development	3	
EDTD 699, Thesis or Professional Paper*	2-5	14-17
Area of Concentration		
(The student will select, with the advisor's approval, vocational education or specific certification requirements if not previously certified. These may be within the Occupational Training & Development Department or from other departments of the University.)	6-10	6-10
Electives	6	6
Minimum Total		**30**

* The student has the option of 6 additional hours of approved graduate course work in lieu of the professional paper. At least 2 of these hours must be in education.

The M.Ed. program must include 15 hours of course work open only to graduate students (600 level and above). Students must pass a final oral examination. Students should contact their program advisors to apply for the oral examination before the last day of mid-term examinations.

Master of Education in Occupational Education (certification program)

Major: OE
Degree: MED
Unit: GE

(Certification for the Administration, Supervision, and Coordination of Occupational Education)

	Semester Hours	Total
Basic Professional Courses		
EDFD 600, Introduction to Research Methods and Statistics	3	
The student must choose, with the approval of the advisor, a course offered in the historical, sociological, or philosophical foundations of education, to be selected from among the following:		
EDFD 620, 625, 629, 630, 631, 640, 681	3	
EDTD 699, Thesis or Professional Paper*	2-5	8-11
Required Core		
ECPY 670, Career Counseling	3	
EDTD 604, Planning and Evaluation in Training and Development	3	
EDTD 605, Organization and Administration of Human Resource Development	3	
EDAD 608, K-12 Leadership	3	
EDTD 681, Research in Occupational Education	3	15
Electives		
The student will select graduate courses related to the area of interest. These courses may be taken within the EDTD Department or from other units or departments of the University. EDTD 615, Human Resource Development, is recommended	3-6	3-6
Minimum Total		**30**

* The student has the option of 6 additional hours of approved graduate course work in lieu of the professional paper. At least 2 of these hours must be in education.

The M.Ed. program must include 15 hours of course work open only to graduate students (600 level and above). Students must pass a final oral examination. Students should contact their program advisors to apply for the oral examination before the last day of mid-term examinations.

Master of Education in Occupational Training and Development

Major: OTD
Degree: MED
Unit: GE

This program is designed to develop competencies appropriate for a variety of training environments, including health care, industry, business, military, public and private service agencies.

This program is appropriate for individuals who have responsibility for designing, developing, delivering and evaluating training programs. The graduates will be able to assess the need for training in organizations, design appropriate courses or training, deliver training programs using a variety of strategies, and determine the effectiveness of training. The courses are planned for instructional designers, training and development specialists and human resource personnel.

	Semester Hours	Total
Basic Professional Courses		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDFD 631, Social Context of Occupational Training and Development (EDFD 620, 625, 629, 630, 640, 681 may substitute for this requirement)	3	6
Required Core		
EDTD 604, Planning and Evaluation in Training and Development	3	
EDTD 661, Adult Development and Learning Principles	3	
EDTD 662, Organizational Analysis for Training & Development	3	
EDTD 663, Methods of Facilitation	3	
EDTD 672, Instructional Design & Development	3	
EDTD 681, Research in Training and Development	3	
EDTD 615, Occupational Education Professional Internship (exit requirement)	3	21
Elective (with approval of advisor)	3	3
Minimum total		**30**

Oral Biology

Master of Science in Oral Biology

Major: OBIO
Degree: MS
Unit: GD

Program Faculty

Professors
Harold E. Boyer
Norbert J. Burzynski
David V. Cohn
Gary A. Crim
Ronald J. Doyle, Program Director
Allan G. Farman
Lawrence Gettleman
Allan Gould
Daniel B. Green
Bruce Haskell
Rowland A. Hutchinson, Dean
Zafrulla Khan
Frederick N. Miller
Richard L. Miller
Frederick M. Parkins
James P. Scheetz
Robert H. Staat
Arthur Van Stewart
John W. Wittwer
John M. Yancey
William W. Young

Associate Professor
Douglas S. Darling
Sven-Ulrik Gorr
Thomas E. Geoghegan
Henry Greenwell
B. Edwin Johnson
Regan L. Moore
John N. Williams, Associate Dean

Assistant Professor
William Scarfe

The School of Dentistry offers a program of study leading to the Master of Science degree in oral biology. The program is directed toward a general understanding of the biology of the oral cavity and related systems. In addition, students obtain the detailed knowledge and necessary skills required to perform dental research. The unit offers a variety of areas for research, including oral microbiology, secretory immune defense mechanisms, skeletal metabolism, mineral homeostasis, nucleic acid biochemistry, and behavioral science.

Program

A minimum of 30 semester hours is needed for the M.S. degree. Requirements for the degree include courses in introductory and advanced oral biology and in data analysis, participation in seminars, and a thesis. The general requirements for admission to the graduate program and general requirements for the degree offered will be found in the General Information section of this catalog.

Other course work may be required as individualized programs are developed by students working with their major professors and graduate committees. The graduate committee also approves proposed thesis research, reviews the thesis research, reviews the thesis for acceptance, and administers a final oral examination.

The M.S. in oral biology offers training particularly important to persons wishing to pursue an academic career in dentistry. The program is available to students wishing to obtain only the M.S. degree, to D.M.D. and M.D. students, and to postdoctoral students in clinical certificate programs.

Pan-African Studies

Faculty

Chair
J. Blaine Hudson, Associate Professor

Professor
Robert Douglas

Associate Professor
Yvonne Jones

Assistant Professor
Lateef O. Badru
B. Folasade Iyun

The Pan-African Studies Division offers courses that may be applied toward graduate degrees in other areas. Students must obtain their program advisor's permission before enrolling in these courses. Students who are interested in more information on these courses should contact the Chair of the Department.

Pharmacology and Toxicology

Faculty

Chair
David W. Hein, Peter K. Knoefel Professor—Molecular pharmacogenetics and epidemiology; genetic predisposition to cancer and drug toxicity .

Professors
George R. Aronoff—Effects of uremia on drug disposition, nephrotoxicity, renal drug metabolism, artificial intelligence.

Frederick W. Benz—Biochemical pharmacology and toxicology; biochemical mechanisms of drug action and toxicity.

Laurence A. Carr—Biochemical neuropharmacology; functional role of brain biogenic amines, interaction of brain neurotransmitters with peripheral immune system.

Theresa S. Chen—Biochemical toxicology; role of glutathione in aging toxicology; general and specific toxicity of environmental pollutants.

Nicholas Delamere—Electrolyte transport mechanisms in epithelia; second messenger regulation of aqueous humor secretion processes; the role of ion transport mechanisms in preserving transparency of the ocular lens.

Harrell E. Hurst—Analytical toxicology and kinetics with emphasis on qualitative and quantitative techniques, including gas chromatography, high pressure liquid chromatography, and GC/mass spectrometry.

Frederick N. Miller—Macromolecular permeability in the microcirculation.

Donald E. Nerland—Biochemical toxicology; metabolism of drugs and environmental pollutants.

William M. Pierce—Mechanisms of bone formation and resorption; carbonic anhydrase mediated secretory function; design of novel drugs for management of osteoporosis or glaucoma; aqueous humor secretion mechanisms.

George C. Rodgers—Toxicokinetics in drug overdoses and pharmacokinetics in pediatric disease states.

Peter P. Rowell—Neuropharmacology; effect of drugs on brain neurotransmitters and receptors.

Leonard C. Waite—Endocrine pharmacology; mechanism of action of hormones; pharmacological modulation of hormone action; mineral homeostasis.

Walter M. Williams—Studies of drug elimination (metabolism and excretion).

John L. Wong—Biological chemistry, molecular dosimetry in environmental health, preparation of monoclonal antibodies to determine chemical exposure metal speciation and comparative dose by new electrochemical bioassay

Thom J. Zimmerman—Pharmacology of drugs used to treat glaucoma, including carbonic anhydrase inhibitors, cholinergic and adrenergic agents.

Associate Professors

Y. James Kang—Molecular and cardiac toxicology; transgenic and knock-out animal models to study oxidative injury and antioxidant systems in the heart; biological functions and toxicological significance of metallothionein and glutathione in vivo.

Steven R. Myers—Drug metabolism, metabolism of xenobiotics and chemical carcinogens; use of hemoglobin as a biomarker in exposure to xenobiotics.

Associates

Michael E. Brier
Harvey L. Edmonds
James E. Jumblatt
Calvin A. Lang
Benjamin Rigor
Avital Schurr

Emeritus and Emerita Faculty

Rose Dagirmanjian
Charles H. Jarboe
Thomas G. Scharff
William J. Waddell

Doctor of Philosophy in Pharmacology and Toxicology

Major: PhTx
Degree: PhD
Unit: GM

Master of Science in Pharmacology and Toxicology

Major: PhTx
Degree: MS
Unit: GM

Programs

The Department of Pharmacology and Toxicology, School of Medicine, offers to qualified applicants programs of study leading to the Master of Science and Doctor of Philosophy degrees.

Expertise in pharmacology or toxicology requires mastery of the physiological and biochemical principles governing cellular function. In addition, modern pharmacology and toxicology are increasingly directed toward the study of the action of drugs and toxic chemicals at the molecular level. Accordingly, applicants possessing a Bachelor of Science degree in chemistry, biology, or one of the other basic sciences are best equipped to undertake graduate study in these disciplines.

Students may select a program which is directed toward pharmacology or toward toxicology. Since program requirements are basically the same, a student may elect to enter the graduate training and delay a decision regarding specialization in either pharmacology or toxicology.

All students are required to complete basic courses in pharmacology and toxicology, molecular biology, biochemistry, and physiology. Additional coursework is individualized to meet the needs and interests of the student.

Further information regarding the Department and the graduate programs is available at the *Department of Pharmacology and Toxicology* website.

Philosophy

Master of Arts in Philosophy

Major: PHIL
Degree: MA
Unit: GA

Faculty

Chair
John H. Flodstrom, Professor

Professors
Marvin E. Greer, Emeritus
Thomas S. Maloney
Dismas A. Masolo
William M. Schuyler, Jr., Emeritus
Osborne P. Wiggins, Jr.

Associate Professors
Charles F. Breslin
Robert H. Kimball

Assistant Professor
Nancy L. Potter

Program

The Department of Philosophy through the College of Arts and Sciences offers a program leading to the Master of Arts in Philosophy.

The Master of Arts degree in philosophy may be earned through intensive studies of trends and movements in philosophy, as well as intensive studies of the works of individual philosophers. Candidates for the Master of Arts degree in philosophy may elect either a thesis or a comprehensive examination option for the degree. Candidates choosing either option may, with the permission of the department, offer 6 hours of electives earned in courses numbered 500 or above from other departments. Both options require that candidates pass a foreign-language examination in either French or German.

Thesis Option
Under the thesis option, students are required to take at least 30 hours at the graduate level, including 6 credit hours for thesis (695-696). At least 12 hours, exclusive of the thesis, must be taken at the 600 level. The thesis must show competence in philosophy and the exercise of research skills.

Nonthesis Option
Under the nonthesis option, students are required to take at least 30 hours at the graduate level, including 18 at the 600 level, and must pass two three-hour written examinations. One examination will cover figures and movements in the history of philosophy; the other will cover systematic philosophical themes historically considered.

Physics

Faculty

Chair
Joseph S. Chalmers, Professor

Professors
C. R. L. Davis
Peter W. France
Wei-Feng Huang
C. S. Jayanthi
John F. Kielkopf
P. J. Ouseph
Shi-Yu Wu

Associate Professors
John C. Morrison
W. Karl Pitts

Assistant Professors
David N. Brown
Mark D. Lindsay

Adjunct Professors
Peter Almond

Emeritus Professors
John A. Dillon, Jr.
Joel A. Gwinn
Roger E. Mills
Manuel Schwartz
John J. Sinai

Programs

Master of Science
The Department of Physics, in the College of Arts and Sciences, offers a program leading to the Master of Science with a major in Physics.

General requirements for admission are listed in the General Information section of this catalog.

Departmental requirements for admission are as follows:

1. A baccalaureate degree with at least 24 hours in physics, or the equivalent.
2. A minimum quality-point standing of 3.0 (base 4.0) in physics courses.
3. Mathematics course work through differential equations. (MATH 405 or equivalent)
4. Submission of the Graduate Record Examination scores in both the aptitude and advanced area tests.

Doctor of Philosophy in Chemistry/Chemical Physics

Students in certain research areas may pursue the Ph.D. in Chemistry in the area of Chemical Physics. Contact the Chair of the Department of Chemistry or the Chair of the Department of Physics for details.

Joint Doctoral Program

The Department also participates in a joint doctoral program with the Department of Physics and Astronomy of the University of Kentucky leading to a Ph.D. in Physics from the University of Kentucky. Contact the Chair of either department for details.

Master of Science in Physics

Major: PHYS
Degree: MS
Unit: GA

General requirements for the M.S. degree are set forth in the General Information section of this catalog. For the M.S. degree, 30 hours are required, of which at least 21 hours must be in courses open to graduates only.

Specific requirements for the M.S. degree in physics are as follows:
1. Required courses in physics (12 hours):
   605, Theoretical Mechanics (3);
   611, Electromagnetic Theory I (3);
   621-622, Quantum Mechanics I & II (6).
2. Physics electives (6-9 hours): courses numbered 500 and above.
3. Courses in one minor field (3-9 hours): Mathematics is the usual minor, but another field may be chosen with the approval of the department.
4. Graduate Research (6 hours).

Physiology and Biophysics

Doctor of Philosophy in Physiology and Biophysics

Major: PHY
Degree: PHD
Unit: GM

Master of Science in Physiology and Biophysics

Major: PHY
Degree: MS
Unit: GM

Faculty

Research interests of the faculty are indicated after each name.

Chair

Irving G. Joshua, Professor - microcirculation: calcium mechanisms in hypertension

Professors

Patrick D. Harris - microvascular control mechanisms

James C. Moore, Emeritus

X. J. Musacchia, Emeritus

Frederick N. Miller - microcirculation: permeability

John C. Passmore - renovascular physiology

Richard W. Stremel - angiogenesis and dynamic skeletal muscle function

Sheppard M. Walker, Emeritus

David L. Wiegman, Vice Dean for Academic Affairs, Medical School and Associate Vice President for Health Affairs

Associate Professors

Gary L. Anderson - microvascular disorders associated with reconstructive surgery

John T. Fleming - microcirculation: diabetes, bone

Andrew M. Roberts - cardiopulmonary system: pulmonary microcirculation control

William B. Wead, - microcirculation and cardiopulmonary interaction

Assistant Professor

Ayotunde S. O. Adeagbo - endothelial factors and vascular control

Jeff C. Falcone - microvascular regulation of blood flow and Ca2+ imaging in Hypertension and aging

Peipei Ping - protein kinase C (PKC) dependent signaling mechanisms in the heart

Programs

The Department of Physiology and Biophysics, in the School of Medicine, offers the opportunity for graduate study leading to the Doctor of Philosophy and Master of Science degrees. Applicants must meet the general requirements of the Graduate School as outlined in the General Information section and must have a genuine interest in a scientific research career. The Graduate Record Examination (General Test and Subject Test in the area of the student's undergraduate major) must be taken.

It is helpful if the applicant has completed courses in calculus and statistics by the time of application. However, deficiencies in these two areas can be made up in the student's graduate program. In our program, the Ph.D. student will be required to complete Neurosciences 615, Physiology 601, and Graduate Biochemistry 645 and 647; and several advanced course electives. The M.S. student will be required to complete Physiology 601 and meet biochemistry and graduate elective requirements.

Political Science

Faculty

Chair
Charles E. Ziegler, Professor

Professors
W. Landis Jones
Philip G. Laemmle
Susan M. Matarese
Paul J. Weber

Associate Professors
Julie M. Bunck
Rodger A. Payne
Laurie A. Rhodebeck
Nathan H. Schwartz
Ronald K. Vogel
Okbazghi Yohannes

Assistant Professors
David L. Imbroscio, Director of Graduate Studies
Andrew C. Scobell

Programs

The Department of Political Science, in the College of Arts and Sciences, offers graduate training leading to the Master of Arts degree. In addition, the Department participates in the Master of Public Administration program.

The M.A. and the M.P.A. are designed to allow a student to pursue a degree either full or part time. Most graduate-level courses are offered in the evening. The M.P.A. is oriented toward those who want an applied job in the public, private, or non-profit sector. The M.A. is oriented toward those who wish to pursue advanced training in political science. For additional information on the M.P.A. program, see the catalogue sections titled Public Administration.

The Department of Political Science also offers its undergraduate majors an opportunity to earn both a B.A. (or B.S.) degree and an M.A. degree in five years of study. This program allows students to earn an M.A. degree at an accelerated pace (approximately one calendar year).

Areas of Concentration
Students in the Master of Arts program are encouraged to organize their programs around one, or perhaps two, of the following areas:

American Politics
The focus of this specialty is on basic American political institutions and the theory and practice of their operation in the American political milieu.

Urban Politics
This specialty examines the social, administrative, political, and economic forces affecting the formation and implementation of public policy in and for urban areas, primarily American.

Comparative Politics and International Relations
Students interested in the international area can build a program with guidance from faculty members in the Political Science Department and other departments emphasizing either a theoretical or area-specific approach to subfields.

Policy and Administration
Study in this specialization focuses on the basic principles of administration, such as organization theory, budgeting, and personnel, as well as the analysis of public policy formation and implementation.

Admission
Applicants must meet the general requirements for admission to the Graduate School and must submit an application to the Department of Political Science. Applicants must have an undergraduate major in social sciences or have sufficient preparation in the social sciences.

The Department requires a 3.0 undergraduate GPA (overall) or a 3.2 undergraduate GPA (last 60 semester hours or equivalent). Applicants must present a combined GRE score of 1500 (Verbal, Quantitative, Analytical). All applicants must take the GRE and hold a BA or BS (or foreign equivalent) before admission to the program can be granted. In addition, applicants must submit a statement of purpose (approximately 300-500 words in length) to the Department. This statement should detail an applicant's educational and professional experiences and goals and relate these goals to the pursuit of graduate study in political science at the University of Louisville. The Department may accept applicants who do not meet these requirements on a conditional basis if sufficient additional evidence of promise of success in the graduate program can be shown. No student will be admitted unconditionally until all materials listed above have been received.

Deadlines
Application deadlines for receipt of all materials are August 1 for the fall semester, December 1 for the spring semester, and May 1 for summer sessions.

Master of Arts in Political Science

Major: POLS
Degree: MA
Unit: GA

Thesis Option

Candidates must complete 24 credit hours of class work and a six-credit thesis, making a total of 30 credits required for the degree. The total may not include more than 6 hours of independent readings and research.

	Semester Hours	Total
Core Courses		
POLS 670 Scope of Political Science	3	
POLS 671 Methods of Political Research	3	
Three of the following five courses:		
POLS 619 Seminar in Public Policy	3	
POLS 625, Seminar in Public Administration	3	
POLS 629 Seminar in American Politics	3	
POLS 639 Seminar in International Relations	3	
POLS 649 Seminar in Comparative Politics	3	15
Electives (with approval of advisor)	9	9
POLS 699, Thesis	6	6
Minimum Total		**30**

Nonthesis Option

Candidates must complete 36 credit hours of classwork. Of this, 27 credits must be in 600-level courses and 24 credits must be taken in the Political Science Department. The total may not include more than 6 credits of independent readings and research. POLS 695, Directed Research, must be taken in the last semester of the candidate's course of study.

	Semester Hours	Total
Core Courses		
POLS 670 Scope of Political Science	3	
POLS 671 Methods of Political Research	3	
Three of the following five courses:		
POLS 619 Seminar in Public Policy	3	
POLS 625, Seminar in Public Administration	3	
POLS 629 Seminar in American Politics	3	
POLS 639 Seminar in International Relations	3	
POLS 649 Seminar in Comparative Politics	3	15
Electives		
Political Science	6-18	
Other graduate courses (with approval of advisor)	0-12	18
POLS 695, Directed Research	3	3
Minimum Total		**36**

Psychology

Faculty

Chair
Dennis Molfese, Professor

Professors
Joseph F. Aponte
John C. Birkimer
Barbara M. Burns
Michael R. Cunningham
Stephen E. Edgell
Edward A. Essock
Robert G. Meyer
Stanley A. Murrell
Heywood M. Petry

Associate Professors
James K. Beggan
Janet W. Borden
Suzanne Meeks
Paul G. Salmon

Assistant Professors
Paul J. DeMarco
Zi Jiang He
Maureen A. McCall

Emeritus Professors
Martin R. Baron
Ray H. Bixler
James M. Driscoll
Samuel Z. Himmelfarb
John A. Robinson
Richard P. Smith

General Information

The Department of Psychology, in the College of Arts and Sciences, offers Master of Arts and Doctor of Philosophy degrees in experimental psychology and clinical psychology. All programs require a 22-hour core of courses, the successful completion of the Preliminary Examination, and the completion of a satisfactory dissertation. In the normal course of events, each student completes a thesis or a research paper for the M.A. Clinical students must complete a one-year approved internship.

Departmental facilities include several computerized laboratories, an electronics shop, physiological laboratories, and a Psychological Services Center. The University also has a Computer Center that is available from departmental stations via a campus-wide network. Additional training opportunities are available through such facilities as the Department of Psychiatry and Behavioral Sciences, the Child Evaluation Center, Seven Counties Services, and numerous other community agencies.

Financial Support
Financial support for graduate students is available in the form of research assistantships, teaching assistantships, service assistantships, Graduate School fellowships, and part-time job and practicum placements in laboratories and community service settings. Information regarding these various awards can be obtained from the Chairperson, Admissions Committee, Department of Psychology.

Admission
Students accepted into the Experimental and Clinical Psychology Programs are admitted to doctoral programs and qualify for candidacy only after passing a Preliminary Examination. To be admitted unconditionally in psychology, to either program, applicants must have earned an undergraduate degree from an accredited college or university, a minimum grade point average of 3.0 for all undergraduate and prior graduate work, and must take the Graduate Record Examination including the Advanced Test in Psychology. Those for whom English is not their native language must also submit TOEFL scores.

In addition to meeting Graduate School requirements for a doctoral degree, (see section on General Requirements) the student must meet departmental requirements such as, core courses, research exercises, the Preliminary Examinations, a thesis or other research requirements, and a dissertation. The candidate interested in detailed information on programs and requirements should request information from the Department of Psychology.

Doctor of Philosophy in Experimental Psychology

Major: EPSY
Degree: PHD
Unit: GA

The Experimental program offers three areas of specialization:

- Cognitive: Which focuses on memory, conceptual behavior, problem solving, language, judgment, decision making, attention, cognitive development, and mathematical models.
- Social: Which focuses on attitudes, interpersonal relations, social influence, social cognition, aggression, group behavior, and health psychology.
- Perception and Sensory Physiology: Which focuses on visual perception, visual neurosciences, and the physiology of the visual system.

All students must complete a general core curriculum (22 hours), the courses and training experiences specified in their area of concentration, and a dissertation. Equivalence of graduate work in psychology at another institution will be evaluated on an individual basis. Active and continuous involvement in research is essential. Accomplishments in research are evaluated separately from performance in courses. To remain in good standing, students must maintain a B average in all courses and demonstrate appropriate progress in research.

Doctor of Philosophy in Clinical Psychology

Major: CPSY
Degree: PHD
Unit: GA

The clinical program adheres to a scientist-practitioner model and is designed to provide training in research, psychological assessment, psychological intervention, and legal and professional issues. The program covers basic theories, current state of knowledge, and skill training in clinical psychology. Faculty expertise is strongest in the areas of anxiety disorders, mental health and adjustments of older adults, stress management and behavioral medicine, and ethnic mental health. Clinical emphases include interpersonal and behavioral-cognitive approaches.

Master of Arts in Psychology

Major: PSYC
Degree: MA
Unit: GA

A minimum of 30 hours of graduate courses (courses numbered 500 and up) is required; these must include the 22-hour department core curriculum. In addition, a thesis, for which up to 6 hours' credit may be given, must be submitted.

The master's degree is an integral part of the Ph.D. program: no separate master's program is offered.

Public Administration

Master of Public Administration

Major: PADM
Degree: MPA
Unit: GB

Program Faculty

Professors
Betty C. Brown (School of Accountancy)
W. Landis Jones (Department of Political Science)
H. V. Savitch (School of Economics and Public Affairs), Program Chair
Paul Weber (Department of Political Science)

Associate Professors
Carrie Donald (School of Economics and Public Affairs)
Thomas S. Lyons (School of Economics and Public Affairs)
Steven Koven (School of Economics and Public Affairs)
Nathan H. Schwartz (Department of Political Science)

Program

The College of Business and Public Administration offers a Master of Public Administration degree in cooperation with the Department of Political Science. The program focuses on general administration, public management, planning, policy analysis, applied research, government and organizational theory. It is multidisciplinary and aimed at providing recent college graduates, public sector practitioners, and persons in related fields, with theoretical knowledge and practical skills that prepare them for non-profit sector and public service careers, or complement their past professional experiences. Classes are held in the evenings to meet the scheduling requirements of persons holding full-time jobs.

The Master of Public Administration offers four areas of specialization, each providing an opportunity to develop a focus through formal studies and professional career development. *The Public Policy and Administration* specialization emphasizes program review, analysis and evaluation, within a traditional public administration framework. The *Urban and Regional Planning & Development* specialization focuses on planning in its geographical, social and economic contexts. The *Labor-Public Management Relations* specialization emphasizes the resolution of disputes in the workplace and the development of partnerships between labor and management. *The Health Policy and Administration* specialization deals with the legal political, managerial, and fiscal aspects of health delivery.

The Program requires a minimum of 42 credit hours for completion: a core curriculum of 27 hours, including 6 hours of practicum or internship, or 6 hours of thesis, and 15 hours from one of the areas of specialization. The core curriculum encompass studies in public administration, budgeting, statistics and organization and management. Students are permitted to simultaneously pursue core and elective courses.

	Semester Hours	Total
Core Courses		
PADM 501 Managerial Statistics	3	
PADM 600 Public Administration and Organizational Behavior	3	
PADM 602 Analytic Methods for Public Professionals	3	
PADM 603 Policy Analysis & Evaluation	3	
PADM 604 Public Budgeting and Finance	3	
PADM 606 Public Policy	3	
PADM 642 Human Resources Management in Public and NonProfit Organizations	3	
PADM 682 Practicum/Internship *or* PADM 695 Thesis	6	27
Public Policy and Administration Option		
Five courses (15 hours) from the following:		
PADM 605 Strategic Management and Planning	3	
PADM 610 Administrative Law and Process	3	
PADM 611 Accounting for Public Administrators	3	
PADM 620 Intergovernmental Relations	3	
PADM 623 Comparative Administration	3	
PADM 624 Ethics in Public Administration	3	
PADM 626 Community Housing Policies	3	
PADM 627 Environmental Policy	3	
PADM 640 Studies in Urban Economics	3	
PADM 671 Special Topics in Public Policy Analysis	3	
PADM 680 Independent Research in Public Administration	3	
PADM 681 Independent Readings in Public Administration	3	
PADM 683 Topical Seminar in Public Administration	3	
PADM 684 Advanced Research Methods	3	
PADM 686 Program Analysis and Evaluation	3	
PADM 688 Land Use and Planning Law	3	15
Urban and Regional Planning and Development Option		
Five courses(15 hours) from the following:		
PADM 605 Strategic Management and Planning	3	
PADM 607 Introduction to Urban Planning	3	
PADM 611 Accounting for Public Administrators	3	
PADM 620 Intergovernmental Relations	3	
PADM 622 Principles of Urban Design	3	
PADM 626 Community Housing Policies	3	
PADM 627 Environmental Policy	3	
PADM 628 Historic Preservation	3	
PADM 629 Transportation Systems	3	
PADM 632 Special Topics in Urban & Regional Planning & Development	3	
PADM 640 Studies in Urban Economics	3	
PADM 645 Planning and Implementing Urban Development	3	
PADM 653 The Public & Private Sectors in Urban Development	3	
PADM 671 Special Topics in Public Policy Analysis	3	
PADM 684 Advanced Research Methods	3	
PADM 686 Program Analysis and Evaluation	3	
PADM 688 Land Use and Planning Law	3	15

Labor-Public Management Relations Option

Five courses (15 hours) from the following:

PADM 605 Strategic Management and Planning.....3
PADM 610 Admnistrative Law and Process 3
PADM 611 Accounting for Public Administration 3
PADM 640 Studies in Urban Economics.....3
PADM 644 Collective Bargaining 3
PADM 646 Comparative Studies in
Worker Management Relations 3
PADM 647 Arbitration 3
PADM 648 Mediation and Dispute Resolution.....3
PADM 649 Legal Aspects of Labor Relations.....3
PADM 651 Trade Unions 3
PADM 652 Equal Opportunity and the Workplace.....3
PADM 654 Special Topics in Worker Management Relations.....3
PADM 671 Special Topics in Public Policy Analysis.....3
PADM 684 Advanced Research Methods.....3
PADM 686 Program Analysis and Evaluation.....3.....15

Health Policy and Administration Option

Required Courses

HADM 620 Introduction to Healthcare Systems.....3
HADM 631 Healthcare Policy 3
HADM 632 Healthcare Law.....3

Elective Courses

Four courses (6 hours from the following):

HADM 621 Health Economics.....1.5
HADM 622 Managed Care.....1.5
HADM 624 Management Accounting and
Cost Analysis for Healthcare 1.5
HADM 625 Healthcare Quality and
Operations Management 1.5
HADM 626 Healthcare Marketing 1.5
HADM 627 Management of
Health Services Organizations 1.5
HADM 628 Medical Informatics.....1.5
HADM 680 Special Topics in Healthcare.....1.5.....15

Minimum Total 42

Secondary Education

Faculty

Chair
Allan E. Dittmer, Professor

Professors
William H. Banks, Jr., Emeritus
John C. Fischetti
William L. Husk, Emeritus
Marjorie Kaiser
Jack C. Morgan
V. Daniel Ochs, Emeritus
Samuel B. Peavey, Emeritus
John H. Pollock, Emeritus
F. Randall Powers, Emeritus
Elizabeth J. Stroble
Randall L. Wells
Betty Lou Whitford

Associate Professor
Robert N. Ronau

Assistant Professor
Ann E. Larson

Programs

The Department of Secondary Education offers a variety of postbaccalaureate degree programs: master's, specialist's and doctoral programs.

Various certification programs available to graduate students, as well as Rank II and Rank I programs, provide considerable flexibility for students to pursue teacher certification as well as expanded professional careers in teaching and related areas.

Master of Arts in Teaching in Secondary Education (certification in grades 8-12)

Major: SE
Degree: MAT
Unit: GE

Admission requirements
1. Admission to Graduate School
2. Admission to Teacher Education
3. Successful completion of EDUC 506 (6)

	Semester Hours	Total
Professional Education Courses		
EDSD 605, Pre-Student Teaching	6	
EDSD 606, Special Methods in Secondary Student Teaching	3	9
Exit Requirement:		
EDSD 607, Student Teaching in the Secondary School I	4	
EDSD 608, Student Teaching in the Secondary School II	4	
EDSD 609, Student Teaching Seminar	3	
EDSD 610, Capstone Seminar	1	12
Academic Support Courses:		
(To be selected with advisor's approval)	12	12
Total		**33**

Master of Education in Secondary Education

Major: SE
Degree: MED
Unit: GE

	Semester Hours	Total
Basic Professional Courses		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDSD 642, Secondary Instruction*	3	
EDSD 654, Secondary Curriculum*	3	

The student will select one course from each of the following areas with approval of an advisor:

A. Human Behavior Development of Learning Area EDSP 545, Exceptional Children in Regular Classroom *or* ECPY 531, Adolescence	3	
B. Educational Context, Policy, Organization Dynamics Area EDFD 630, School in the American Social Order *or* EDFD 640, Developing a Philosophy of Education *or* EDFD 6xx (consult advisor)	3	15
Area of Specialization		
In consultation with the graduate advisor, students must select the 12 semester hours in the area in which they are certified or in a specialization area, such as Instructional Technology, Counseling, Reading, Special Education, or Gifted Education.	12	12
Elective (approved by advisor)	3	3
Minimum Total		**30**

Exit Requirement*
The exit requirement is to guide students in making connections between their previous and current educational professional experience and to project their goals for growth in teaching and leadership. All students are required to enroll in EDSD 642 at the beginning of their program, and EDSD 654 near the end.

The M.Ed. program must include a minimum of 30 semester hours of graduate level courses, of which 15 semester hours must be at the 600-level.

Faculty

Chair
Clara Leuthart, Professor

The Social Sciences Division offers courses that may be applied toward graduate degrees in other areas. Students must obtain their program advisor's permission before enrolling in these courses. Students who are interested in more information on these courses should contact the Chair of the Department.

Social Work

Master of Science in Social Work

Master of Science in Social Work

Major: SW
Degree: MSSW
Unit: GK

Faculty

Dean
Terry L. Singer

Associate Dean
Sam L. Neal

Professors
Gerard Barber
Joseph H. Brown
Dana N. Christensen
Thomas R. Lawson
Gale Goldberg Wood

Associate Professors
Stanley R. Frager
Suzanne Midori Hanna
Ruth Huber
Thomas F. Maher
Ruth N. Paton

Assistant Professors
Alana Atchinson
Priscilla Gibson
Bibhuti K. Sar
Dan Wulff
Pamela Yankeelov

Associate Professor Research
Anita Barbee-Cunningham

Instructor (Term)
Iris Phillips
Martha A. Fuller

Accreditation
The Master of Science in Social Work program is accredited by the Council on Social Work Education. The Family Therapy program is accredited by the Commission on Accreditation for Marriage and Family Education.

Admission to Kent School of Social Work
Persons interested in admission to the Kent School should contact the Admissions Office, Kent School of Social Work, Oppenheimer Hall, University of Louisville, Louisville, Kentucky 40292 (502/852-6517), FAX: (502)852-0422. We encourage potential applicants to visit the Kent School and ask that you simply call to make an appointment for an interview. Kent School seeks mature students with a demonstrated ability to work with people, emotional stability, good interpersonal skills, good health, and the ability to perform well academically. To ensure that entering students meet these standards, the faculty has set the following requirements:

1. A bachelor's degree from an accredited institution of higher learning.
2. A minimum of 27 credit hours in liberal arts: Communications (6), Natural Sciences (3), Humanities (9), Social Sciences (9).
3. Applicants must have completed a course in statistics, a course in research methodology, and a course in human biology as prerequisites for admission. Applicants must show evidence of successful completion of such courses and must submit a course description(s). A student who needs to complete only two of these three may be granted a Conditional admission, and must successfully complete prerequisites by the end of the second semester. Upon such completion the Conditional status will be removed. Students who have not completed the prerequisites by the end of the second semester will not be allowed to enroll in social work courses.
4. Each applicant must submit a typed 300-500 word signed autobiographical statement describing the applicant's: (a) understanding of and interest in the social work profession; (b) life experiences that may enhance ability to practice social work; and (c) assessment of strengths, as well as areas that will need improvement, in preparation for becoming a responsible social worker.
5. At least three reference forms are required. A reference from each supervisor of the applicant during work or field instruction experiences is needed. If these include more than three persons, the most recent supervisors should be used. One reference should be from a person familiar with the applicant's academic ability and recent performance. If the applicant has not enrolled in classes within the past five years, this requirement may be waived and an additional work reference substituted. The School reserves the right to request additional supportive material from persons acquainted with the applicant's academic and/or prior practice capabilities.
6. Miller Analogies Test (MAT) scores from applicants with a grade point average of less than 2.5.
7. For all applicants whose native language is not English, Kent School requires the Test of English as a Foreign Language(TOEFL). A score of 550 on the TOEFL is required. Scores must be submitted before a decision will be made on an application.

Admission Procedures
The application file is complete when all of the following are received by the Kent School Admissions Office:

1. A completed application form.
2. A $25.00 processing fee.
3. Two official transcripts from each institution of higher learning attended must be mailed directly to the Admissions Office, Kent School of Social Work. If an applicant is attending classes at the time of application to Kent School, two current transcripts must be sent. Two final official transcripts indicating the awarding of a degree must be submitted to the Kent School.
4. An autobiographical statement, typewritten and signed.
5. Three references (one academic and two employment, which can include field instruction or volunteer work) must be sent directly to the Kent School Admissions Office by the reference person.
6. Evidence of satisfactory completion (grade + course description) of statistics, research methodology, and human biology prerequisites must be submitted along with the application.
7. MAT and TOEFL scores, when applicable, must be sent directly to the Admissions Office, Kent School. Tests may be taken at the nearest university or through the University of Louisville Testing Service.

The Admission staff will do everything possible to facilitate completion of the applicant's file. However, it is the applicant's responsibility to request the items needed and to check with the Admissions Office to determine whether they were, in fact, received. No faxes will be accepted. The Admissions Committee will review the application only when all credentials are on file.

Admission Application Date
Admission is determined on a rolling basis. Students are encouraged to submit their applications as early as possible to the Fall semester in which they wish to enroll. ALL materials must be received by the Kent School before an admission decision can be made.

Curriculum
The program leading to the degree of Master of Science in Social Work focuses on developing professional leaders in social work practice. The program connects an intensive academic component with a practicum, allowing the student to learn and immediately apply theory. The curriculum is designed so that students will obtain competence in both generalist practice and an area of concentration. The first year of study exposes students to generalist practice to include an understanding of and intervention with different levels of systems; i.e., individuals, families, groups, organizations and communities. The second year of study provides an option for one of two areas of concentration, advanced direct practice and advanced macro practice. Both concentrations are grounded in a strengths based perspective that incorporates concern for social justice. They differ in the level of system targeted for intervention.

Two-Year Weekday Program

Year 1
Fall
SW 601 Life Cycle and Human Development
SW 602 Social Welfare Institutions, Policies, and Services
SW 603 Human Diversity
SW 604 Social Work Practice I
SW 670 Social Work Practicum I

Spring
SW 605 Social Work Practice II
SW 619 Human Transactions in the Social Environment
SW 622 Issues in Policy and Service Delivery
SW 626 Research Methodology and Design
SW 671 Social Work Practicum II

Year 2
Fall
SW 640 Advanced Direct Practice I
or SW 691 Advanced Marco Practice I
SW 668 Advanced Research Practice I
SW 672 Social Work Practicum III
Elective
Elective

Spring
SW 641 Advanced Direct Practice II
or SW 692 Advanced Macro Practice II
SW 669 Advanced Research Practice II
SW 673 Social Work Practicum IV
Elective
Elective

All courses are three credits each

Two-Year Weekend Program

Year 1
Fall
SW 601 Life Cycle and Human Development
SW 602 Social Welfare Institutions, Policies, and Services
SW 604 Social Work Practice I
SW 670 Social Work Practicum I

Spring
SW 605 Social Work Practice II
SW 619 Human Transactions in the Social Environment
SW 622 Issues in Policy and Service Delivery
SW 671 Social Work Practicum II

Summer
SW 603 Human Diversity
SW 626 Research Methodology and Design

Year 2
Fall
SW 640 Advanced Direct Practice I
or SW 691 Advanced Marco Practice I
SW 668 Advanced Research Practice I
SW 672 Social Work Practicum III
Elective

Spring
SW 641 Advanced Direct Practice II
or SW 692 Advanced Macro Practice II
SW 669 Advanced Research Practice II
SW 673 Social Work Practicum IV
Elective

Summer
Elective
Elective

All courses are three credits each

Three-Year Saturday Program

Year 1
Fall
SW 601 Life Cycle and Human Development
SW 602 Social Welfare Institutions, Policies, and Services

Spring
SW 619 Human Transactions in the Social Environment
SW 622 Issues in Policy and Service Delivery

Summer
SW 603 Human Diversity

Year 2
Fall
SW 604 Social Work Practice I
SW 670 Social Work Practicum I

Spring
SW 605 Social Work Practice II
SW 671 Social Work Practicum II
Elective

Summer
SW 626 Research Methodology and Design
Elective

Year 3
Fall
SW 640 Advanced Direct Practice I
or SW 691 Advanced Macro Practice I
SW 668 Advanced Research Practice I
SW 672 Social Work Practicum III

Spring
SW 641 Advanced Direct Practice II
or SW 692 Advanced Macro Practice II
SW 669 Advanced Research Practice II
SW 673 Social Work Practicum IV

Summer
Elective
Elective

One additional elective will need to be taken to complete degree work. This may be taken during the second or third summer as an additional course, or at the Belknap campus anytime beginning Spring semester of the second year.

Family Therapy Program

The Family Therapy Program in the Kent School of Social Work offers graduate study in marital and family therapy (MFT). The curriculum meets coursework requirements for certification in the state of Kentucky and for Clinical Membership in the American Association for Marriage and Family Therapy (AAMFT). Courses are offered in theoretical foundations of marital and family therapy, assessment and treatment in marital and family therapy, and professional studies and ethics in MFT. This knowledge base includes major theoretical models within the field, major approaches to couple therapy and specialized knowledge in the areas of human sexuality, family violence, substance abuse and mental disorders. Supervised clinical practice includes individual or dyadic supervision, group supervision and supervision through direct observation. Participants are required to complete core courses, 100 hours of MFT supervision and 500 hours of MFT relational client contact while in the program. Students are taught the skills and techniques recognized in professional literature as critical to the effective practice of marital and family therapy.

Coursework and programs can be accessed in three ways:
1. Elective coursework (SW 651, SW 659, SW 660) can be taken by any graduate student in a related field.
2. An MFT specialization is available for students pursing the M.S.S.W. within the Kent School of Social Work. This requires a separate application process.
3. A Post-Master's Certificate in MFT is available for those who already have master's degree in a related field and who wish to qualify for Certification in MFT in the Commonwealth of Kentucky or for Clinical Membership in the American Association for Marriage and Family Therapy. Application materials for the MFT Specialization and the Post-Master's Certificate Program are available from the Family Therapy Program.

Specialization in MFT
The program offers a specialization in MFT for students who hold a baccalaureate degree and who wish to qualify in MFT while pursuing the M.S.S.W. Participants gain skills in working with couples, families and individuals from relational and interactional perspectives. Specific MFT requirements are met concurrently with M.S.S.W. requirements. In 1998, candidacy was awarded for this program through the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE) of the American Association for Marriage and Family Therapy (AAMFT). ***Curriculum Requirements .*** For traditional 60-hour students, the concentration is an additional 15-hour course of study (see modified course planning guide with MFT concentration added). For advanced standing students, the concentration is an additional 21-hour course of study. Coursework includes selected courses from the required M.S.S.W. curriculum and MFT elective and core courses. The advanced field placement requires approved supervision from AAMFT Approved Supervision. ***Admission Requirements .*** Applicants wishing to be admitted into the MFT concentration must first meet general entrance requirements established by the Kent School of Social Work for the M.S.S.W. An additional process for the MFT specialization has been established that further determines personal integrity, professional maturity and interpersonal competence. Enrollment is limited. Application processing takes 6-8 weeks. ***Admission deadline .*** M.S.S.W. students applying for the MFT concentration must apply and be admitted. Those wishing to be admitted to the M.S.S.W. program will be processed once school admission is verified.

Post-Master's Certificate in MFT

In cooperation with Family and Children's Agency of Metropolitan Louisville, the program also offers a Post-Master's Certificate that has been accredited since 1991 by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE) of the American Association for Marriage and Family Therapy (AAMFT). This program is designed for students already holding a masters' degree in a human services field. The program is structured to accommodate the schedules of community professionals working full time. Length of the program varies from 2-3 years, depending upon the number of hours logged per week in client contact. ***Curriculum requirements .*** MFT core courses and 500 hours of supervised clinical practice are required. Elective courses may also be required for those who have not already met pre-requisite requirements. Prerequisite graduate courses include family studies (9 hrs), human development (9 hrs), research (3 hrs) and a practicum during the master's degree. ***Admissions requirements*** . Applicants wishing to be admitted for a Post-degree certificate must hold an M.S.W. from an institution accredited by the Council on Social Work Education (C.S.W.E.) or a master's degree from a regionally accredited institution in MFT or in a closely related field. These must be completed before admission to the certificate program. In addition to this, applicants must have a volunteer or work position in an approved setting that affords them weekly client contact outside the program. ***Admission deadline .*** Applications for the Post-Master's Certificate must be completed by March 1. Applicants are notified of final decisions in May.

Doctor of Philosophy in Social Work

Major: SW
Degree: Ph.D.
Unit: GK

Faculty

Program Director

Ruth Huber, Associate Professor, University of Louisville

Doctoral Program Faculty

Gerard M. Barber, University of Louisville
Surjit S. Dhooper, University of Kentucky
Kay Hoffman, Dean, University of Kentucky
Thomas R. Lawson, University of Louisville
David D. Royse, University of Kentucky
Terry L. Singer, Dean of the Kent School, University of Louisville
Gale Goldberg Wood, University of Louisville

Associate Professors

James J. Clark, University of Kentucky
Janet B. Ford, University of Kentucky
Ruth Huber, University of Louisville
Ruth N. Paton, University of Louisville
Elizabeth Rompf, University of Kentucky

Associated Faculty

Professors

Joseph Aponte, Psychology, University of Louisville
Phillip K. Berger, Public Administration, University of Kentucky
Edward Berman, Education, University of Louisville
Joseph Brown, Family Therapy, University of Louisville
Lauretta F. Byers, Social Work, University of Kentucky
Dana Christensen, Family Therapy, University of Louisville
Richard R. Clayton, Sociology, University of Kentucky
Paul L. Cornelius, Statistics, University of Kentucky
Michael Cunningham, Psychology, University of Louisville
Everett Egginton, Education, University of Louisville
Stephan Gohmann, Economics, University of Louisville
Thomas Keil, Sociology, University of Louisville
Harold L. Kleinert, Interdisciplinary Human Development Institute, University of Kentucky
Carol Lukefeld, Social Work, University of Kentucky
Thomas W. Miller, Psychology, University of Kentucky
Joseph Petrosko, Education, University of Louisville
Rory Remer, Education, University of Kentucky
Gordon Ruscoe, Education, University of Louisville
Hank Savitch, Urban Policy, University of Louisville
Jane Thibault, Professor, School of Medicine, University of Louisville
Alfred Thompson, Medicine, University of Louisville
Wayne Usui, Sociology, University of Louisville
Lane Veltcamp, Social Work, University of Kentucky
M. O'Neal Weeks, Family Studies, University of Kentucky
David R. Wekstein, Physiology, University of Kentucky
Richard J. Welsh, Social Work, University of Kentucky
Thomas A. Widiger, Psychology, University of Kentucky
Constance P. Wilson, Social Work, University of Kentucky

Associate Professors
Ruth A. Baer, Psychology, University of Kentucky
John R. Ballantine, Social Work, University of Kentucky
Gregory W. Brock, Family Studies, University of Kentucky
Ken Duckworth, Education, University of Louisville
Suzanne Hanna, Family Therapy, University of Louisville
Laurie R. Hatch, Sociology, University of Kentucky
Stephan Looney, Family and Community Medicine, University of Louisville
Suzanne Meeks, Psychology, University of Louisville
Stephen Miller, Education, University of Louisville
Elizabeth L. Rompf, Social Work, University of Kentucky
Nathan Schwartz, Political Science, University of Louisville
Nathan R. Sulivan, Social Work, University of Kentucky
Constance L. Wood, Statistics, University of Kentucky

Assistant Professors
Katherine Amato-von Hemert, Social Work, University of Kentucky
Dinah G. Anderson, Social Work, University of Kentucky
Filix O. Chima, Social Work, University of Kentucky
James J. Clark, Social Work, University of Kentucky
Carol Cummings, Psychology and Pan-African Studies, University of Louisville
Janet P. Ford, Social Work, University of Kentucky
David Imbroscio, Political Science, University of Louisville
B. Jan McCulloch, Family Studies, University of Kentucky
Emmanuel Okorley, Education, University of Kentucky
Gary W. Paquin, Social Work, University of Kentucky
Thomas T. Ranz, Pharmacy, University of Kentucky
Holly A. Riffe, Social Work, University of Kentucky
Mary C. Secret, Social Work, University of Kentucky
Robert Slaton, Family and Community Medicine, University of Louisville
Mary V. Sprang, Social Work, University of Kentucky
Richard D. Sutphen, Social work, University of Kentucky
Jefery Talbert, Public Administration, University of Kentucky

Doctor of Philosophy in Social Work

Major: SW
Degree: Ph.D.
Unit: GK

General Information
The Ph.D. in Social Work is offered in partnership by the University of Louisville and the University of Kentucky. Students may matriculate in either institution, and they will be guided by professors from both universities in several shared courses and memberships on their doctoral committees. The program is administered under the purview of the Graduate Schools of the two institutions, and students are subject to the policies, standards, rules, and procedures of the institution where they matriculate.

The program offers the opportunity for academically-motivated masters level social workers to continue their studies at the doctoral level. The two goals of the program are: 1) to prepare doctoral graduates to serve as faculty members in institutions of higher education, and 2) to prepare administrators, planners, policy analysts, and program evaluators for positions in a broad range of social service agencies.

Financial Support
Financial support for doctoral students in social work includes fellowships and graduate assistantships. All inquiries concerning financial support for students intending to matriculate at the University of Louisville should be addressed to: Ruth Huber, Ph.D., Director of the Ph.D. Program in Social Work, 200 Patterson Hall, University of Louisville, Louisville, KY 40292.

Admission to the Ph.D. Program
Prospective students should apply to the institution where they plan to matriculate. Program faculties forward their recommendations to a combined (U of L - UK) admissions committee for recommendation to the Graduate Schools of the two institutions. Applicants should present career objectives consistent with the social work profession and demonstrate strong potential to complete a rigorous academic research program. Admission criteria include:

1. Master's degree in social work from a program accredited by the Council on Social Work Education (CSWE), or judged to be equivalent (foreign graduates);
2. Two years' post-Master's full-time, paid experience in social work is preferred;
3. An undergraduate grade point average (GPA) of 2.5, and a graduate GPA of 3.5 or higher, on 4.0 scales;
4. Official transcripts from each university/college attended;
5. Graduate Record Examination (GRE) Aptitude Test scores: Successful applicants will ordinarily have a combined score of 1,000 on the Verbal and Quantitative sections and not less than 400 in each section;
6. Three letters of reference (including at least two academic references and one from an employer);
7. A resumé
8. A statement that describes career and research interests and reasons for pursuing a doctoral program (no more than 3 pages);
9. A sample of scholarly writing (e.g., Master's thesis, published article, term paper); and
10. A pre-admission interview.

Advising
Early in the program of study, each student will be assigned an advisor. The student's Advisory Committees should be established by the end of the first semester of course work. At least one member of each committee must be from the cooperating institution. Students may take courses from either or both institutions.

Qualifying Examinations
Students must sit for qualifying examinations after completing the fourth semester of full-time study (or the equivalent number of hours of part-time study). The qualifying examinations are designed to test breadth of knowledge in the discipline of social work.

Dissertation (18 Credit hours)
The dissertation includes the design and implementation of a major research project, the results of which are expected to contribute to the social work knowledge base. Students are expected to present the results of their dissertation research orally.

Curriculum
The program requires a total of 44 post-Master's credits of course work plus a minimum of two full-time semesters of dissertation research. The curriculum consists of:

	Semester Total	Hours
Core Curriculum		
Human Behavior and Change Theories in Social Work Practice	3	
Advanced Analysis of Social Welfare Problems	3	
Theory Development in the Social Work Profession	3	
Teaching in Social Work	3	
Ethics, Social Work, and Society	3	
Social Work Research I & II	6	
Statistics for Social Work I & II	6	
Professional Seminar I & II	2	29
Individualized Plan of Study (15 credit hours)		
Research or Teaching Practicum	3	
Nine credit hours of course work in an area of scholarly study	9	
Research in Social Work Seminar	3	15
Dissertation Credit Hours (two full-time semesters)	18	18
Minimum Total		**62**

Sociology

Faculty

Chair
Thomas J. Keil, Professor

Professors
Badr-El-Din Ali, Emeritus
James E. DeBurger, Emeritus
Jon H. Rieger
Wayne M. Usui
J. Allen Whitt

Associate Professors
D. Mark Austin
John A. Busch
K. Robert Durig, Emeritus
Patricia Gagné
Cynthia Negrey

Assistant Professor
Lateef O. Badru
Melissa Evans-Andris
Susan E. Kelly
Shawn L. Schwaner

Programs

The Department of Sociology, in the College of Arts and Sciences, offers graduate training leading to the Master of Arts.

The M.A. program is designed to allow a student to pursue a degree either full-or part-time. Many courses are offered in the evening so that those employed full-time can also pursue graduate education. Full-time students can normally complete the program in two years; those who are employed full-time typically require three years to complete the program.

The program is designed to fill the needs of students wishing to pursue the Ph.D. in sociology, as well as those who are planning careers in the public and nonprofit sectors. The program also provides skills for those seeking employment in private research firms or in the field of information technology and program evaluation.

This program has both thesis and non-thesis options. Please contact the Department for specific information.

In addition to the traditional M.A. in sociology, the department also offers a M.A. in sociology with a concentration in communications, geography, and pan-African studies. These concentrations are offered in conjunction with their respective departments. For further information concerning these programs, contact the sociology department and/or the department of concentration interest.

Admission
Applicants must meet the general requirements for admission to the Graduate School. Those applying for the M.A. program should have completed a minimum of 15 undergraduate semester credits in sociology (or the equivalent), which should include courses in theory, methodology, and introductory statistics. Remedial course work may be required before admission where significant deficiencies exist in prior preparation. Applicants must meet current departmental standards with respect to scholastic standing and Graduate Record Examination scores.

Evaluation of all applicants' files for the M.A. program is made by the departmental Graduate Program Committee. No applicant shall be permitted to register for courses until all required materials have been submitted and he or she has been officially admitted by the Graduate School. Non-degree status shall be afforded to those students who do not seek a degree. Applicants for admission should complete their files not later than June 1.

Graduate Assistantships
The Sociology Department has available annually a limited number of graduate assistantships. Applicants wishing to compete for one of these must submit all materials for admission, including GRE scores, not later than March 1. Announcement of awards is normally made on or about March 5.

Enrollment and Program Guidance
The Graduate Program Coordinator serves in an advisory capacity to students for enrollment and program planning until such time as an advisor and/or a thesis chairperson has been formally designated. At this point the thesis advisor and/or chair assumes the primary responsibility for guidance of the student.

Academic Standards
In order to be retained in the program, graduate students must receive a grade of 3.0 or better in each of the department's core courses and must maintain an overall average of at least a 3.0 in all course work taken for graduate credit. Any student whose cumulative quality-point total falls to three fewer than three times the number of credits attempted will receive a warning in writing from the chair of the Graduate Program Committee. Any student whose cumulative quality-point total falls to six fewer than three times the number of credits attempted shall not be retained in the program.

Master of Arts in Sociology

Major: SOCI
Degree: MA
Unit: GA

	Semester Hours	Total
Thesis Option		
Core Courses		
SOC 510 Computer Data Analysis	3	
SOC 604 Proseminar in Sociology	1	
SOC 610 Seminar in Statistics	3	
SOC 615 Seminar in Research Methodology	3	
SOC 620 Seminar in Sociological Theory	3	
Other Sociology Courses*		
Must include at least 3 hours at the 600-level. Consult with advisor	12	
SOC 600 Thesis	6	
Minimum Total		**31**
Internship Option		
Core Courses:		
SOC 510 Computer Data Analysis	3	
SOC 604 Proseminar in Sociology	1	
SOC 610 Seminar in Statistics	3	
SOC 615 Seminar in Research Methodology	3	
SOC 620 Seminar in Sociological Theory	3	
Other Sociology Courses*		
Must include at least 6 hours at the 600-level. Consult with advisor.	18	
SOC 600 Internship	6	
Minimum Total		**37**
Comprehensive Exam Option		
Core Courses:		
SOC 510 Computer Data Analysis	3	
SOC 604 Proseminar in Sociology	1	
SOC 610 Seminar in Statistics	3	
SOC 615 Seminar in Research Methodology	3	
SOC 620 Seminar in Sociological Theory	3	
Other Sociology Courses*		
Must include at least 9 hours at the 600-level. Consult with advisor.	24	
Minimum Total		**37**

* A student may take up to 6 hours of study outside the department, but only with the permission of the department. See the Department's Graduate Advisor.

5 Year BA-BS/M.A. Program in Sociology

The program is designed to allow motivated undergraduates with a high GPA to earn a BS/BA and an MA in Sociology in five years. Students will apply for the program during their Junior year and will begin the program in their senior year.

During their senior year, students accepted into the program will be allowed to take two 600 level courses or Sociology 510 and one 600 level course. The credits earned in these courses will meet both the undergraduate degree requirements and will be counted toward the hours required for the M.A. Upon completion of the undergraduate degree, students will begin the graduate program and take the appropriate number of hours remaining for the degree option they select. Under normal circumstances, students can expect to complete all requirements for the MA in one calendar year of study following completion of the BA/BS. Students accepted into the program will be eligible to apply for Graduate Assistantships. Assistantships will be awarded for the year following completion of the undergraduate degree.

Admission Requirements: 3.25 undergraduate GPA at time of application and a combined total GRE score of 1350 (Verbal, Quantitative, and Analytical Reasoning). Applicants also will be expected to submit two letters of recommendation and a completed Graduate Admissions Questionnaire.

Special Education

Faculty

Chair
Denzil Edge, Professor

Professors
Edward P. Berla
Hilda R. Caton, Emerita
Anne O. Netick, Emerita

Associate Professors
James Neal Blake, Emeritus
Nettye Brazil
John E. Garrett, Emeritus
Marvin C. Holmes
Sharon Bortner Moore
Thomas J. Simmons
Deborah L. Voltz

Program

The Department of Special Education in the School of Education, offers a variety of postbaccalaureate degree programs: master's, specialist's and doctoral programs. Non-degree Rank I and Rank II programs are available as well as certification programs in Learning and Behavior Disorders, Moderate and Severe Disabilities, Vision Impairment, and Early Childhood Education/Special Education. These programs provide considerable flexibility for students to pursue expanded professional careers in teaching and related areas.

Certification Program for Moderate and Severe Disabilities

Major: EDSP
Concentration: MSVD
Unit: GE

These courses do not constitute a degree program, but may be incorporated into a Master of Education, Rank I Equivalency, or Rank I program.

Admission Requirements
1. Baccalaureate degree from an accredited college or university
2. A teaching certificate valid for regular classroom teaching in grades P-5, 5-9, or 8-12
3. Admission to Graduate School

	Semester Hours	Total
Certificaton Requirements		
EDSP 615, The Normalization Principle in Human Service Systems	3	
EDSP 627, Practicum in Blindness/Visual Impairments and Application of Technology	3	
EDSP 634, Introduction to Mental Retardation	3	
EDSP 635, Moderate and Severe Disabilities Practicum	4	
EDSP 636, Diagnostic/Prescriptive Teaching of Individuals with Moderate Mental Retardation	3	
EDSP 637, Collaborative Consultation	3	
EDSP 638, Educational Management of Physical and Multiple Disabilities	3	22
Additional requirements for the M.Ed. and Rank programs (consult advisor)		
EDFD 600, Introduction to Research Methods and Statistics (M.Ed. only)	3	
One course in the philosophical, historical, or sociological foundations to be selected from: EDFD 620, 625, 629, 630, 640, or 681	3	
Electives	9	
Minimum Total		31

Successful completion of the appropriate Praxis specialty exams are also required for teacher certification.

Certification Program for Visual Impairment and Blindness

Major: EDSP
Concentration: SVI
Unit: GE

These courses do not constitute a degree program, but may be incorporated into a Master of Education, Rank II Equivalency, or Rank I program.

Admission Requirements

1. Baccalaureate degree from an accredited college or university
2. A teaching certificate valid for regular classroom teaching in grades P-5, 5-9 or 8-12
3. Admission to Graduate School

	Semester Hours	Total
Certification Requirements		
EDSP 624, Educational, Physical, Psychological and Social Aspects of Visual Impairment and Blindness	3	
EDSP 625, Standard English and Nemeth Braille Codes	3	
EDSP 626, Educational Procedures for Low Vision Individuals	3	
EDSP 627, Practicum in Blindness/Visual Impairment and Applications of Technology	3	
EDSP 628, Assessment Procedures for Visually Impaired	3	15
EDSP 629, Student Teaching Visually Impaired	3	
EDSP 636, Diagnostic/Prescriptive Teaching of Individuals with Moderate Mental Retardation	3	
EDSP 637, Collaborative Consultation	3	
EDSP 638, Educational Management of Physical and Multiple Disabilities	3	12
Additional requirements for the M.Ed. and Rank programs (consult advisor)		
EDFD 600, Introduction to Research Methods and Statistics (M.Ed. only)	3	
One course in the philosophical, historical, or sociological foundations to be selected from: EDFD 620, 625, 629, 630, 640, or 681	3	6
Minimum Total		**33**

Successful completion of the appropriate Praxis specialty exams are also required for teacher certification.

Rank II Certification in Special Education with Concentration Learning and Behavior Disorders

Major: SPE
Concentration: SLBD
Unit: GE

(For teachers not previously certified in learning and behavior disorders)

This program is designed for elementary education majors, and leads to certification in learning and behavior disorders, Rank II, and/or Master of Education degree in learning and behavior disorders.

Admission Requirements

1. Baccalaureate degree from an accredited college
2. Certification in elementary or secondary education*
3. Introductory or survey course in special education

Rank II and Learning and Behavior Disorders Certification (34 hours)

	Semester Hours	Total
Basic Professional Courses		
EDSP 594, Problems and Methods of Teaching the Physically Handicapped	3	
EDSP 681, Early Childhood Education of Exceptional Children (not required if secondary certified)	3	
EDSP 675, Management of the Behavior Disorder Child	3	
EDSP 673, Educational Procedures for Exceptional Children: Diagnostic and Prescriptive Education	3	
EDSP 682, Workshop-Career Education for Mildly Handicapped	3	
EDSP 640, Introduction to Learning Disorders	3	
EDSP 537, Language Learning for Exceptional Children	3	21
Graduate Core		
EDFD 6XX, A course in philosophy, history, or social foundations of education	3	3
The following courses must be taken sequentially and/or concurrently:		
EDSP 642, Assessment Procedures for Learning and Behavior Disorders	3	
EDSP 643, Instructional Procedures for Learning and Behavior Disorders	3	
EDSP 645, Student Teaching: Learning and Behavior Disorders	4	10
Total for Certification		**34**

* Secondary certified persons must take four courses in reading and math such as the following or other approved courses:
EDEM 511, Reading & Writing in Content Areas (3)
EDEM 613, Remediation in Literacy I (3)
EDEM 620, Introduction to Teaching Elementary Math Education (3)
EDEM 622, Assessment of Instruction in Math Education (3)

Master of Education in Special Education with concentration in Learning and Behavior Disorders

Major: SPE
Concentration: SLBD
Degree: MED
Unit: GE

M.Ed. Requirements

The M.Ed. includes all courses listed in the Rank II program above and the following requirements:

	Semester Hours	Total
EDFD 600, Introduction to Research Methods and Statistics	3	3
Specialization		
Nine hours chosen from the following:		
EDSP 615, Normalization Principle in Human Service Systems	3	
EDSP 693, Consulting with Parents and Teachers of Exceptional Children	3	
EDSP 697, Topical Seminar in Special Education	3	
EDSP 639, Research Analysis in Special Education	3	
EDSP 676, Educational Planning for the Behavior Disorder Child	3	
EDSP 536, Language Development & Language Disorders	3	9
Exit Requirement		
EDSP 645, Student Teaching: Learning and Behavior *or* EDSP 639, Research Analysis in Special Education	3	3
Minimum Total		**46**

Master of Education in Special Education with concentration in Severe Behavior Disorders

Major: SPE
Concentration: SSBD
Degree: MED
Unit: GE

Admission Requirements

1. Baccalaureate degree from an accredited college
2. Certification in elementary education
3. Certification in learning and behavioral disorders

	Semester Hours	Total
Graduate Core		
EDFD 600, Introduction to Research Methods and Statistics	3	
The student will choose, with the approval of the advisor, a course offered in the historical, sociological, or philosophical foundations of education to be selected from among the following: EDFD 620, 625, 629, 630, 640, 681	3	6
Behavior Disorders Specialization		
EDSP 674, Theories of Behavior Disorders	3	
EDSP 676, Educational Planning for the Behavior Disorder Child	3	
EDSP 697, Topical Seminar in Special Education	3	9
Special Education Core		
EDSP 536, Language Development and Language Disorders	3	
EDSP 641, Curriculum Methods in Special Education	3	
EDSP XXX (to be selected in consultation with advisor)	3	9
Related Electives		
(may be taken outside School of Education; subject to approval of advisor)	6	6
Exit Requirement		
EDSP 639, Research Analysis in Special Education *or* EDSP 677, Practicum: Education of the Behavior Disorder Child	3-4	3
Minimum Total		**33**

Master of Education in Special Education with concentration in Mental Retardation

Major: SPE
Concentration: SMR
Degree: MED
Unit: GE

Admission Requirements
1. Baccalaureate degree from accredited college
2. Certification in elementary education
3. Certification in learning and behavior disorders

	Semester Hours	Total
Graduate Core		
EDFD 600, Introduction to Research Methods and Statistics	3	
The student will choose, with the approval of the advisor, a course offered in the historical, sociological, or philosophical foundations of education to be selected from the following: EDFD 620, 625, 629, 630, 640, 681	3	6
Mental Retardation Specialization		
EDSP 615, The Normalization Principle in Human Service Systems	3	
EDSP 697, Topical Seminar (MR Topic)	3	
EDTD 630, Occupational Education for Youth & Adults with Special Needs	3	
EDSP (to be selected in consultation with advisor)	3	12
Special Education Core		
EDSP 536, Language Development and Language Disorders	3	
EDSP 641, Curriculum Methods in Special Education	3	6
Related Electives		
EDEM (graduate course in reading)	3	
Elective (may be taken outside the School of Education; subject to approval of advisor)	3	6
Exit Requirement		
EDSP 639, Research Analysis in Special Education	3	
Minimum Total		**33**

Master of Education in Special Education with concentration in Learning Disabilities

Major: SPE
Concentration: SLD
Degree: MED
Unit: GE

Admission Requirements
1. Baccalaureate degree from accredited college
2. Certification in elementary education
3. Certification in learning and behavior disorders

	Semester Hours	Total
Graduate Core		
EDFD 600, Introduction to Research Methods and Statistics	3	
The student will choose, with the approval of the advisor, a course offered in the historical, sociological, or philosophical foundations of education to be selected from the following: EDFD 620, 625, 629, 630, 640, 681	3	6
Learning Disabilities Specialization		
EDSP 693, Consulting with Parents and Teachers of Exceptional Children	3	
EDSP 697, Topical Seminar in Special Education	3	6
Special Education Core		
EDSP 641, Curriculum Methods in Special Education	3	
EDSP (to be selected in consultation with advisor)	6	9
Related Electives		
(may be taken outside the School of Education; subject to approval of advisor)	9	9
Exit Requirement		
EDSP 639, Research Analysis in Special Education	3	3
Minimum Total		**33**

Master of Education Degree in Special Education

Major: SPE
Degree: MED
Unit: GE

This degree is designed for master's degree candidates whose professional goals are in areas other than teaching or whose goals are in the area of early childhood/special education, specifically comprehensive-care centers, institutions, clinics, day care centers, preschools, and community programs.

Prerequisites for Admission

1. Baccalaureate degree from an accredited college
2. Admission to Graduate School

Degree Requirements

1. A minimum of 33 semester hours of graduate coursework
2. At least 18 hours of courses numbered 600 or above
3. A culminating course, either EDSP 639 or EDSP 687, to be taken at the end of the program and requiring a major paper.

	Semester Hours	Total
Core Requirements		
EDFD 600, Introduction to Research Methods and Statistics	3	
The student will choose, with advisor approval, a course offered in the historical, sociological, or philosophical foundations of education to be selected from the following: EDFD 620, 625, 629, 630, 640 or 681	3	6
Introductory Courses		
Three of the following, selected with advisor's approval:		
EDSP 697, Seminar in Psychological and Social Implications of Handicaps	3	
EDSP 536, Language Development and Disorders	3	
EDSP 537, Language Learning for Exceptional Children	3	
EDSP 634, Introduction to Mental Retardation	3	
EDSP 640, Introduction to Learning Disabilities	3	
EDSP 674, Theories of Behavior Disorders	3	9
Advanced Courses		
Courses will be selected, with advisor's approval, to provide the necessary background to meet the candidate's professional goals	9	9
Related Electives	6	6
Exit Requirement		
EDSP 639, Research Analysis in Special Education	3	3
Minimum Total		**33**

Master of Education in Special Education with concentration in Early Childhood Special Education (certification for Birth to Primary)

Major: SPE
Concentration: ERE
Degree: MED
Unit: GE

This program is designed for students who hold ***at least*** a baccalaureate degree in any academic area and who are interested in receiving birth to primary teacher certification in Kentucky. The program includes a ***minimum*** of 39 hours of coursework. However, some students admitted to the program may not have general teacher competencies and will need to take the Pre-Teacher Education Core. Due to the differing backgrounds of the students who enter the program, completion of the Self-Assessment to determine areas of strength and need will be required upon admission. Specific information regarding the Self-Assessment to determine areas of strength and need will be required upon admission.

Admission Requirements

1. Baccalaureate degree from an accredited college
2. Admission to Graduate School
3. EDUC 501: Pre-Teacher Education Core I
4. EDUC 502: Pre-Teacher Education Core II
5. EDUC 503: Pre-Teacher Education Core III: Elementary School
6. Self-Assessment completed

Graduate Core	Semester Hours	Total
EDFD 600, Introduction to Research Methods and Statistics (required only for the MED)	3	
EDFD 630, The School in the American Social Order	3	
EDUC 629, Interdisciplinary Seminar in Early Childhood Education	3	
EDEM 627, Applied Child Development	3	
EDEM 635, Administration and Consultation: Day Care and Early Childhood Education (Field-Based)	3	
EDEM 683, Early Childhood/Special Education Screening	3	
EDSP 684, Early Family Intervention for Preschool Children with Disabilities	3	
EDSP 686, Programs & Services for Preschool Children with Disabilities	3	
EDSP 687, Practicum/Action Research (Exit requirement)	6	30
Curriculum (Select 2 courses)		
EDEM 505, Infant/Toddler Development and Care	3	
EDEM 632, Curriculum Problems in Early Childhood Education	3	
EDEM 633, Curriculum and Methods for Early Childhood Special Education	3	
EDEM 643, Emergent Literacy	3	6
Development (Select 2 courses)		
EDSP 536, Language Development and Language Disorders	3	
CMDS 652, Childhood Language Disorders	3	
HPES 618, Adapted Physical Activity	3	
HPES 565, Nutrition for Children and Adolescents	3	
EDEM 636, Theories of Play	3	
EDEM 630, Theories of Child Development	3	6
Minimum Total		**42**

NOTE:
The Rank II Equivalency Program may only be pursued by those who currently hold teacher certification in another area. Professional development may be substituted in lieu of up to twelve (12) semester hours of college credit at the request of the candidate as part of the Rank II Equivalency Progam.

Professional Certification for Director of Special Education

Major: EDSP
Unit: GE

Prerequisites

1. Kentucky certification as a teacher of exceptional children in one of the categories of exceptionality, school psychologist, or supervisor of curriculum instruction.
2. A Master's Degree in Special Education or related field.
3. Three years of experience as a teacher of exceptional children, school psychologist, or supervisor of curriculum.

	Semester Hours	Total
Certification Requirements		
EDSP 610, Administration and Supervision in Special Education	3	
EDAD 620, Legal Issues in P-12 Education	3	
EDAD 608, K-12 Leadership	3	
EDAD 720, Advanced Internship in Administration and Supervision	6	15

NOTES:

Students who make a grade below "C" in any Special Education course leading to State Teacher Certification are required to repeat the course and earn a minimum grade of "C."

Supervisors of curriculum must also have courses or background in special education instructional methods, materials, and programs including those in preschool special education. The formal training and experience of school psychologists will be evaluated and additional coursework/experience may also be necessary.

Specialist in Education in Special Education

Major: SPE
Degree: EDS
Unit: GE

Admission Requirements

1. A master's degree in special education or a master's degree in another area with 15 hours of graduate-level course work in special education
2. Three years of successful teaching experience in special education and/or appropriate professional experience prior to granting of the degree
3. General standards for the Ed.S.
4. Writing examination administered by the department
5. Recommendation by the department

	Semester Hours	Total
Research		
Educational Core Requirements		
One course from the following:		
EDSP 639, Research Analysis in Special Education EDFD 601, Applied Statistics An appropriate equivalent approved by the Ed.S. committee	3	
Foundations		
One course from the following:		
EDSP 720, Historical and Philosophical Bases of Special Education		
EDSP 615, The Normalization Principle in Human Service Systems		
An appropriate foundations course approved by the Ed.S. committee	3	
Special Education Specialization		
Courses selected with committee's approval and directly related to the candidate's goal statements, as expressed in the application	15	15
Research Paper		
EDSP 799, Professional Paper	6	6
Electives		
Courses outside of special education but directly related to educational goals. Committee approval required	6	6
Minimum Total		**33**

Theatre Arts

Faculty

Chair
Michael F. Hottois, Professor

Professors
Albert J. Harris
David Palmer

Associate Professors
Rinda Frye
Stephen C. Schultz
James Tompkins

Assistant Professor
Lundeanna M. Thomas
Trudy N. Wheeler

Programs

The Department of Theatre Arts, in the College of Arts and Sciences, offers programs leading to the degrees of Master of Fine Arts or Master of Arts. The programs are committed to the concept of the "educated artist" as the ideal theatre professional. Both artistry and scholarship are emphasized because neither can fully function without the other; good artistic production requires both artistic and intellectual discipline, and good scholarship requires familiarity with production practices. Therefore, the programs stress (1) skills needed for effective work in one or more aspects of theatrical production, and (2) concepts of dramatic theory, literature, and history needed for an effective understanding of theatrical art.

Admission
Prerequisites for admission to the program are a baccalaureate degree from an accredited college or university and admission to the Graduate School. The department requires that a resume of theatrical experience accompany the application.

Unconditional admission requires completion of basic undergraduate course work in each of the following areas: theatre history, dramatic literature, design/technical theatre, acting/directing. To accomplish this purpose, students may be required to take preparatory courses not to be counted toward the degree.

Applicants for admission to the M.F.A. program must present either a finished audition or complete portfolio, demonstrating theatrical skills that clearly indicate potential for excellence, and must be interviewed to determine level of preparation and commitment.

The Master of Fine Arts
The fundamental objective of the Master of Fine Arts degree program in theatre is to provide students with the academic and artistic training necessary to prepare them to make meaningful contributions to the profession. These contributions may be at all levels of professional theatre, including college and university theatre.

Specific objectives of the M.F.A. program are:
1. To train professional theatre artists in a program featuring a sound academic base. The curriculum has been designed so that a student may acquire the broad range of complex skills required of a professional theatre artist. In keeping with the "educated artist" philosophy of the department, the artist-in-training will simultaneously acquire professional skills and the rigorous academic education a university is uniquely equipped to offer.
2. To train teachers of theatre to teach at the college and university level.

The M.F.A. degree in theatre is recognized by the vast majority of colleges and universities as a terminal teaching degree. Any graduate of an M.F.A. program who decides to teach in a college theatre program will be fully certified to do so; because of the academic component of this program, that teacher will be better prepared for the collegiate intellectual environment than will the M.F.A. graduate of many other schools.

The general requirements for the Master of Fine Arts degree are completion of 72 semester hours of graduate level work and of a final artistic project and monograph that demonstrate the artistic and intellectual quality expected of professional artists and technicians at all levels of theatre.

In accordance with the philosophy of the program, the 72 hours of course work must include each of three basic areas: skill courses in one or more areas of theatrical production (42 hours), academic courses providing an intellectual background in the art (18 hours), and practicum credit for artistic projects undertaken to apply acquired skills (18 hours, including the monograph).

In addition, students in the program are encouraged to undertake an internship experience for course credit. Many of Louisville's professional arts organizations have agreed to participate in this internship program; the credit hours earned for an internship may be applied to the requirement in practicum projects or in skills courses, or may be divided between the two, depending upon the nature of the experience and the student's training needs.

Options and Requirements for the MFA
Two options are available to the student in the M.F.A. program. These options place emphasis on Performance (acting), or on Production (including design and technical theatre). These options differ only in the selection of specific skills courses and practical projects undertaken.

Master of Fine Arts in Theatre Arts (Performance Option)

Major: TA
Degree: MFA
Unit: GA

The program must include not less than 26 semester hours at the 600-level, exclusive of TA 600 and TA 650. A minimum total of 72 hours is required to complete the program.

	Semester Hours	Total
Course Requirements		
Academic Area		
TA 620 Performance Theory	3	
TA 670 Dramatic Theory and Criticism	3	
TA 571 Playscript Interpretation	3	
Students must take 2 of the following:		
TA 661 Approaching Period Drama (3)		
TA 662 Approaching Realistic Drama (3)		
TA 663 Approaching Anti-Realistic (3)	6	
Elective	3	18
Area of Concentration		
TA 520 Acting Workshop I & II	6	
TA 521 Advanced Stage Movement I	3	
TA 522 Advanced Stage Movement II	3	
TA 523 Advanced Stage Speech I	3	
TA 622 Graduate Movement I & II	6	
TA 623 Graduate Voice I & II	6	
TA 624 Graduate Acting I - IV	12	42
Project Area		
TA 625 M.F.A. Performance Projects	9	
TA 600 Thesis Guidance (monograph)	3	12
Total		**72**

Master of Fine Arts in Theatre Arts (Production Option)

Major: TA
Degree: MFA
Unit: GA

The program must include not less than 26 semester hours at the 600-level, exclusive of TA 600 and TA 650. A minimum total of 72 hours is required to complete the program.

	Semester Hours	Total
Course Requirements		
Academic Area		
TA 640 Design Theory	3	
TA 670 Dramatic Theory and Criticism	3	
Electives	6-12	12-18
Area of Concentration		
TA 541-542 Advanced Scene Design I & II	6	
TA 544-545 Costume Design I & II	6	
TA 548-549 Advanced Lighting Design I & II	6	
TA 542 Sketching and Rendering I & II	4	
TA 543 Scenographic Techniques	3	
TA 546 Advanced Stage Makeup	1	
Electives	9-15	36-42
Project Area		
TA 645 MFA Production Projects	9	
TA 600 Thesis Guidance (monograph)	3	
TA 645 MFA Production Project (Optional)	0-6	12-18
Minimum Total		**72**

Master of Arts in Theatre Arts

Major: TA
Degree: MA
Unit: GA

Candidates for the M.A. degree must pass at least 30 hours at the graduate level, at least 12 of which (exclusive of 3 hours credit for the successful completion of the thesis) must be in courses open only to graduate students, i.e., courses on the 600-level. Not more than 6 hours in Directed Readings (TA 656) may be applied to the degree program. Not more than 6 hours may be in courses outside the Theatre Arts Department. Not more than 6 hours in theatre performance/production courses may be applied to the degree program. The student must demonstrate a reading knowledge of at least one language other than English.

Each student will normally take 6 hours of credit in TA 560, Directed Study in Theatre History. To earn this credit, the student must attend lectures, supplemented with substantial written work demonstrating the ability to analyze, synthesize, and evaluate secondary sources in theatre history and literature.

The comprehensive examination will consist of 6 hours of written examination and 2 hours of oral examination, during which the candidate will be required to demonstrate the capacity to analyze, synthesize, and evaluate information from the completed coursework and from a reading list provided by the examining committee. The reading list may include material usually covered in graduate-level courses listed by this department but not taken by the student.

The thesis will study some problem relating to theatrical history, literature, and/or theory, and will demonstrate the ability to analyze, synthesize, and evaluate information derived from primary sources. The completed thesis should be of suitable scope for publication as a leading article in a major scholarly journal.

M.A. Program

	Semester Hours	Total
Required Courses:		
ENGL 601, Approaches to Scholarship & Research	3	
TA 560, Directed Study in Theatre History	3	
TA 656, Directed Readings in Theatre	3	
TA 600, Thesis Guidance	3	
TA 620, Performance Theory or TA 670, Dramatic Theory	3	
Elective Courses:		
TA 600-level	3	
TA courses or related field (500 or 600) (must be approved by advisor)	9-12	
Minimum Total		**30**

Urban and Public Affairs

Doctor of Philosophy in Urban and Public Affairs

Major: UPA
Degree: PhD
Unit: GB

Program Director
Steven Bourassa, Professor

Professors
Scott Cummings
John Gilderbloom
Peter Meyer
H.V. Savitch

Associate Professors
Steven G. Koven
Thomas S. Lyons

Program
The College of Business and Public Administration offers a doctoral degree in Urban and Public Affairs. The program prepares students for careers in university teaching, public and non-profit administration, public policy research, urban development and planning and program evaluation. Research competence, administrative skills, and the evaluation of public policy are strongly emphasized in the doctoral program.

Students are required to complete a sequence of core courses comprising 24 credit hours. Specialty areas are offered in Urban Policy Analysis, Urban Planning and Development, Urban Organizational Administration, and Infrastructure & Environment. Doctoral students must complete 12 semester hours in one specialty area and 12 semester hours of dissertation research. The program requires a minimum of 48 credit hours of course work beyond the master's degree. All students must successfully complete comprehensive examinations in one area of specialization and in research methods, before beginning formal dissertation work. Students should consult the Program Guide and Handbook for details.

Admission Requirements
To be admitted unconditionally to the Ph.D. in Urban and Public Affairs, the applicant must meet all requirements of the Graduate School and the minimum standards set by the program. Successful applicants must:

- hold a master's degree or equivalent professional degree in an appropriate field.
- show professional or research competence in the field of urban and public affairs.
- achieve a score of at least 1500 (verbal, quantitative, and analytical) on the General Test Section of the Graduate Record Examination.

In unusual circumstances, applicants who do not meet these standards may be admitted conditionally and given an opportunity to demonstrate their preparation for graduate work in urban and public affairs.

	Semester Hours	Total
Core Courses		
UPA 602 Urban Government and Administration	3	
UPA 603 Studies in Urban Economics	3	
UPA 606 Research Methods	3	
UPA 607 Statistics for Urban and Public Affairs	3	
UPA 610 Urban Theory & Public Affairs	3	
UPA 621 Program Evaluation and Impact Analysis	3	
UPA 646 Urban and Public Finance	3	
UPA 699 Ph.D. Research Seminar	3	24
One Specialty Area (listed below)	12	12
UPA 700 Dissertation Research	12	12
Minimum Total Hours		48

Specialty Areas:
The student must pursue one of the specialty areas and is expected to complete 12 hours from among the courses listed for the chosen option.

Urban Policy Analysis Option

UPA 620 Analytical Models for the Urban Policy Analysis	3
UPA 622 Urban and Community Needs Assessment	3
UPA 625 Macroeconomic Theory	3
UPA 626 Econometrics	3
UPA 627 Decision Models	3
UPA 630 Politics of Policy Formation	3
UPA 632 Independent Study	1-6
UPA 643 Inequality and Public Policy	3
UPA 651 The Politics of Urban Development	3
UPA 680 Special Topics in Urban & Public Affairs	3
UPA 684 Urban Planning Theory and Process	3

Urban Planning and Development Option

UPA 605 History of Urban Development	3
UPA 622 Urban and Community Needs Assessment	3
UPA 626 Econometrics	3
UPA 627 Decision Models	3
UPA 629 Urban Geography and Information Systems	3
UPA 632 Independent Study	1-6
UPA 640 Urban & Community Economic Development	3
UPA 643 Inequality and Public Policy	3
UPA 647 Urban Finance & Budgeting	3
UPA 648 Housing	3
UPA 651 The Politics of Urban Development	3
UPA 680 Special Topics in Urban and Public Affairs	1-6
UPA 682 Principles of Urban Design	3
UPA 683 Land Use and EnvironmentalPlanning	3
UPA 684 Urban Planning Theory & Process	3
UPA 685 Urban Architecture	3
UPA 686 Critical History of Urban Architecture	3

Urban Organizational Administration Option

UPA 627 Decision Models 3
UPA 630 Politics of Policy Formation.....3
UPA 632 Independent Study 1-6
UPA 647 Urban Finance & Budgeting 3
UPA 660 Advanced Organizational Behavior 3
UPA 661 Public Administration 3
UPA 662 Administrative Law and Processes.....3
UPA 663 Organizational Theory, Structure & Design 3
UPA 667 Human Resource Management in
Public and Nonprofit Organizations.....3
UPA 672 Strategic Planning & Management 3
UPA 680 Special Topics in Urban & Public Affairs.....1-6

Infrastructure and Environment Option

UPA 632 Independent Study 1-6
UPA 680 Special Topics in Urban & Public Affairs 3
UPA 688 Transportation Planning and Urban Development.....3
UPA 689 Traffic Engineering & Operations 3
UPA 690 Public Transportation.....3
UPA 691 Ground-water & Seepage.....3
UPA 692 Stochastic Processes in Hydrology 3
UPA 693 Industrial Waste Treatment 3
UPA 695 Hazardous Waste Management 3
UPA 696 Case Studies of Urban Infrastructure 3

Visual Sciences

Doctor of Philosophy in Visual Sciences

Major: VISC
Degree: PHD
Unit: GM

Faculty

Chair
Thom J. Zimmerman, Professor - Glaucoma pharmacology.

Director of Ph.D. Program
Nicholas A. Delamere, Professor - Cell membrane transport

Professors
Charles C. Barr - Retinal disease
Parimal Bhattacherjee - Pharmacology of eicosanoid receptors and cellular signalling
John W. Gamel - Ocular pathology
James E. Jumblatt - Biochemistry and pharmacology of ocular receptors
Prasad Kulkarni - Ocular inflammation
Barbara J. McLaughlin - Retina and corneal cell biology
Christopher A. Paterson - Physiology and pharmacology

Associate Professors
Robert B. Aramant - Retinal transplantation
Douglas Borchman - Lipid chemistry
Robert David Fechtner - Visual defects related to glaucoma
M. Douglas Gossman - Plastic surgery and ocular anatomy
Marcia Jumblatt - Corneal cell biology

Assistant Professors
Magdalene J. Seiler - Retinal transplantation

Joint Professors
Nigel Cooper (Primary Appointment: Anatomical Sciences & Neurobiology) - Neurobiology
Robert D. Gray (Primary Appointment: Biochemistry) - Proteinases and proteinase inhibitors in corneal destruction
William M. Pierce, Jr. (Primary Appointment: Pharmacology & Toxicology) - Drug design and delivery.

Joint Assistant Professor
Ronald G. Gregg (Primary Appointment: Biochemistry) - Molecular biology.

Associates
Edward Essock - Visual perception
Maureen McCall - Visual neuroscience
Heywood Petry - Visual neuroscience
Cecilia M. Yappert - Composition and structure of lens proteins and membranes

The Department of Ophthalmology and Visual Sciences, in the School of Medicine, offers a program of graduate study leading to the award of the Doctor of Philosophy degree. Established in 1993, the research-based program is designed to give students a strong foundation in a basic science discipline coupled with a detailed understanding of the component tissues of the eye, visual processing, diseases of the eye, and current ocular therapeutic strategies. The program prepares the student for a career as an independent researcher and/or teacher in basic science related to vision. Students complete a core curriculum during the initial two years. Courses include visual science, medical biochemistry, microscopic anatomy, neuroscience, physiology, medical pharmacology, advanced cell biology, visual psychology, seminar, and several specialized elective courses such as retinal cell biology.

The courses and number of credit hours each student completes may vary according to the needs of each individual. After completing the core curriculum, students must successfully complete an oral qualifying examination. The balance of the requirements for the Ph.D. degree include the completion of an original research project by the student, the presentation of the results of this investigation in a dissertation and a research seminar, and the successful defense of the dissertation.

Research studies are conducted on a topic directly related to the visual system and are, under most circumstances, carried out under the supervision of a departmental faculty member. The expected time for completion of the Ph.D. program is four years.

Some forms of financial support may be available. University Fellowships are available on a competitive basis to highly qualified students. The department provides a number of graduate students with stipends as well as tuition remission. Students may qualify for stipend and tuition support from research grants awarded to departmental faculty members.

For information, contact Nicholas A. Delamere, Department of Ophthalmology & Visual Sciences, School of Medicine, University of Louisville, Louisville, Kentucky 40292, (502) 852-5459 or via e-mail delamere@louisville.edu.

Women's Studies

A Graduate Certificate in Women's Studies is offered to students pursuing degrees in other areas, to students who already hold the Master's degree, or to post-baccalaureate students. Courses in Women's Studies may be also be applied toward graduate degrees in other areas. Students must obtain their program advisor's permission before enrolling in these courses. Students who are interested in more information on these courses should contact Dr. Nancy M. Theriot in the History Department. Women's Studies courses are taught by faculty throughout the University, but primarily from departments in the College of Arts and Sciences. The following faculty members have been accepted as Women's Studies Affiliated Faculty, which means that they teach Women's Studies courses, participate in Women's Studies meetings and committee work, and advise students interested in Women's Studies. The list of Affiliated Faculty is constantly growing.

Faculty

Chair
Nancy Theriot, Associate Professor of History

Professors
Ann Allen, History
Barbara Burns, Psychology
Thomas B. Byers, English
Julia Dietrich, English
Susan Griffin, English
Suzette Henke, English
Marianne Hutti, Nursing
Wendy Pfeffer, Classical and Modern Languages
Edwin S. Segal, Anthropology

Associate Professors
Rinda Frye, Theatre Arts
Patricia Gagne, Sociology
Kathleen Kirby, Educational and Counseling Psychology

Assistant Professor
Pam Takayoshi, English

Programs

Students may pursue graduate work in Women's Studies in three different ways.

The Women's Studies Program of the College of Arts and Sciences offers an interdisciplinary graduate certificate in Women's Studies to students who are accepted into a UofL graduate program and wish to do concentrated work in Women's Studies. A graduate certificate in Women's Studies is awarded in conjunction with a graduate degree for completing 12 hours of course work approved by the Women's Studies chairperson. The 12 hours of course work may also count toward the student's degree. Students wishing to pursue a graduate certificate in Women's Studies in conjunction with a degree should apply for the certificate program by consulting the Women's Studies chairperson after admission to a UofL graduate program. The Women's Studies chairperson shall inform the student's degree program chairperson of the student's application for the graduate certificate in Women's Studies and shall work with the degree program chairperson to facilitate the student's completion of degree and certificate requirements.

The Women's Studies Program also offers an interdisciplinary graduate certificate in Women's Studies to post-baccalaureate students who are not pursuing a graduate degree but who want to focus on women's studies at the graduate level. The non-degree certificate requires 15 hours of course work approved by the Women's Studies chairperson. Post-baccalaureate students wishing to pursue a graduate certificate in Women's Studies outside of a degree-granting program must apply for admission through the Graduate School.

A student may also pursue graduate work in Women's Studies through the Interdisciplinary Studies Program. See catalogue for more information about Interdisciplinary Studies. After contacting the Dean of the Graduate School, for information about application and program development in Interdisciplinary Studies, students who choose to focus on Women's Studies through Interdisciplinary Studies should contact the Women's Studies chairperson for advice about shaping a program proposal.

Requirements for the graduate certificate in Women's Studies for students in degree-granting programs

1. A total of 12 hours of courses at the 500 or 600 level, approved by the Women's Studies chairperson.
2. At least one course must be at the 600 level.
3. At least one course must be outside of the department in which the student is pursuing the degree.
4. At least one course must focus on feminist theory (this may be waived if the student has had a theory course approved by the Women's Studies chairperson).
5. Please note that a single course can satisfy more than one of these requirements.
6. Please note that the 12 hours of certificate course work may also count toward the student's graduate degree.

Requirements for the graduate certificate in Women's Studies for post-baccalaureate students not pursuing a graduate degree

1. A total of 15 hours of courses at the 500 or 600 level, approved by the Women's Studies chairperson.
2. At least two courses must be at the 600 level.
3. Courses must be chosen from both humanities and social science disciplines.
4. At least one course must focus on feminist theory (this may be waived if the student has had a theory course approved by the Women's Studies chairperson).

Course Descriptions

Course Descriptions Section Contents

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Accounting (0505-ACCT)

ACCT 500 Fundamentals of Accounting (1.5)
Note: Fulfills a Foundation Core requirement only.
Fundamental principles of accounting needed by the manager. Topics include the assumptions of accounting, recording and reporting transactions; interpretation of data for decision-making purposes.

ACCT 600 Managerial Accounting (3)
Prerequisite: ACCT 500.
Emphasizes uses of accounting for managerial decisions, planning control and evaluation. Discussion of accounting concepts and procedures, accounting statements, budgets, income measurement, and costs.

ACCT 611 Cost and Operations Management (3)
Prerequisite: Admittance to the Master of Accountancy Program.
An integrated course using traditional and innovative cost accounting and production management techniques and concepts to analyze decisions necessary to produce goods and provide service.

ACCT 615 Not-for-Profit and Governmental Accounting (2)
Prerequisite: Admittance to the Master of Accountancy program.
Study and application of Government Accounting Standards and GAAP for not-for-profit organizations from both a reporting and decision-making perspective.

ACCT 620 Management Control Systems (3)
Prerequisite: ACCT 600.
Uses of accounting systems in aiding management control. Transfer pricing, managed costs, cost centers, performance centers, investment centers, activity based management. Not regularly offered.

ACCT 621 Mergers and Consolidations (1)
Prerequisite: Admittance to the Master of Accountancy Program.
Coverage of the financial accounting reporting rules and processes for various business combinations.

ACCT 631 Federal Taxation (3)
Prerequisite: Admittance to the Master of Accountancy Program.
Focus is on the individual taxpayer. Coverage includes federal income tax of the individual, income taxation of estates and trusts, retirement and family tax planning, and the estate and gift tax.

ACCT 641 Financial Accounting and Professionalism (4)
Prerequisite: Admittance to the Master of Accountancy Program.
Covers the standard setting process for generally accepted accounting principles. Includes application of GAAP to create financial statements. Additional focus on the ethical and professional expectations of the CPA.

ACCT 651 Auditing and Systems I (2)
Prerequisite: Admittance to the Master of Accountancy Program.
Focuses on the design, implementation and documentation of accounting information systems. Emphasis also placed on the internal control system and proper audit trails. First course of a two-course sequence.

ACCT 652 Auditing and Systems II (6)
Prerequisite: ACCT 651.
Covers all aspects of analyzing and auditing an accounting information system; including generating financial statements, risk assessment, writing audit reports, and operational audits. Second course of a two-course sequence.

ACCT 680 Special Topics in Accounting (1-6)
An advanced study of one or more selected topics or issues related to the study of Accounting.

ACCT 698 Research Seminar in Accounting (1-3)
Prerequisite: ACCT 600 and permission of departmental chair.

Administration and Higher Education (0701-EDAD)

EDAD 504 School Law for Teachers (3)
Examines legal issues, concepts and principles in education as related to teacher job requirements, welfare benefits, and relations with others.

EDAD 603 Administrative Leadership in a Reform Environment (3)
In this reform environment leaders will learn about leading schools within an integrated policy and governance framework from the federal, state, and district perspectives. Particular attention will be paid to the Kentucky Education Reform Act of 1990.

EDAD 604 Instructional Leadership and Supervision (3)
Examines concept of school culture, supervision skills and approaches, observation instruments, and action models for instructional supervision. This course takes a proactive, school success approach to school administration.

EDAD 606 Introduction to Educational Leadership (3)
Provides opportunity to study the complexities of school organizations and leadership roles within the school structure. Observations (60% of course time) (through structured module assignments) and in-class activities (40% of course time) are included. Must be taken prior to EDAD 608 and EDAD 609 as part of initial Level I certification programs.

EDAD 607 Principles of Educational Leadership (3)
Examines concepts, analytical tools, case material, and organizational theories from the public, business, and educational administration sectors.

EDAD 608 K-12 Leadership (3)
Examination of critical responsibilities of K-12 educational leaders, including building and system administrators and supervisors, through guided observations outside of class (30% of course time) and through in-class activities (70% of course time). Emphases on processes and skills required in the context of reform in Kentucky and in the nation.

EDAD 609 Internship in Educational Leadership (3)
Field-based, monitored leadership application activities augmented by seminars which assemble interns for reflection and informed discussions. The student will have the opportunity to "learn-by-doing" administrative work. Emphasis is upon elements of the Education Reform Act of 1990 and its implementation. Pass/Fail grading.

EDAD 610 Collaboration and Communication for Effective Leadership (3)
A lecture-laboratory course to build student awareness and skills for effective collaborative leadership, communication, decision-making, community relations, and group management.

Prerequisites
Prerequisites for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDAD 612 Human Resource Management (3)
Focuses upon transformational leadership crucial to educational reform. Study of management skills including building personnel motivation, improving evaluation and development systems, and other personnel-related topics.

EDAD 620 Legal Issues in P-12 Education (3)
Examination of constitutional and statutory provisions and court decisions affecting educational leadership in P-12 education.

EDAD 622 Educational Resource Management in P-12 Education (3)
Study of resources, practices and procedures of finance and economics as related to P-12 education. Provides investigation of specific and current educational finance issues affecting educational institutions.

EDAD 623 Special Problems in Managing Instructional Improvement (1-6)
Prerequisite: Consent of instructor.
Provides skills for persons engaged in instructional leadership who desire to investigate and/or develop specific functional programs for the purpose of improving instruction.

EDAD 639 The School Superintendency (3)
Focuses on the job responsibilities of the school district superintendent with reference to the knowledge, skills, and dispositions necessary to serve successfully.

EDAD 649 School System Administration (3)
Focuses on school system operations, including management of finances, auxiliary services, human resources, federal and state programs, facilities, and curriculum and instruction.

EDAD 659 Planning (3)
Focuses on the development of planning, implementation, and leadership skills needed to direct strategic decision-making.

EDAD 679 The Superintendency Practicum (2-6)
Focuses on the role of the school district leaders in practice. Students enrolling in the practicum are expected to spend time interacting with practicing district-level administrators.

EDAD 680 Legal Issues in Postsecondary Education (3)
Examination of constitutional and statutory provisions and court decisions affecting educational leadership in postsecondary education.

EDAD 682 The Organization and Administration of Higher Educational Institutions (3)
Exploration of organizational and administrative theory as related to colleges and universities and assessment of the roles of major administrative units of the institution. Purpose is to aid students seeking to become college or university administrators or faculty members.

EDAD 683 College Teaching (3)
Analysis of the elements of effective college teaching; observation and evaluation of teaching; opportunities for micro-teaching; and investigation of rights and responsibilities of faculty members.

EDAD 684 Educational Resource Management in Postsecondary Education (3)
Study of resources, practices and procedures of finance and economics as related to postsecondary education. Provides investigation of specific and current educational finance issues affecting educational institutions.

EDAD 686 The Two-Year College (3)
Analysis of the groups which mold and shape the two-year college as an institution; consideration of the three major adaptive responses of the college as an organization, administration, curriculum and instruction, and student personnel services; and analysis of fundamental issues facing the two-year college as it seeks to adapt to the social, educational, and economic needs of society.

EDAD 689 Special Problems in Improving Educational Administration and Management (1-6)
Provides skills for persons engaged in educational leadership who desire to explore specific functional techniques for the purpose of improving administration and management.

EDAD 690 Internship in Postsecondary Education (2-6)
Provides on-the-job learning and professional development for future postsecondary administrative personnel. Seminars are held periodically under the direction of the University Coordinator.
Pass/Fail grading.

EDAD 696 Independent Study in Educational Administration (1-3)
By arrangement with advisor and consent of dean.

EDAD 698 Supervised Readings (1-3)
By arrangement with advisor and consent of dean.

EDAD 699 Thesis or Professional Paper (1-6)
Culminating paper for masters degree in higher education. By arrangement with advisor.

EDAD 700 Doctoral Seminar in Educational Administration (2)
Prerequisite: Admission to Ed.D. program.
Study of meaning and requirements of doctoral study. Discussion of current literature. Pass/Fail.

EDAD 701 Advanced Organizational Theory (3)
Focus is on integrating the various theories of organizations and management into an overarching general systems theory.

EDAD 720 Advanced Internship in Administration and Supervision (2-6)
Prerequisite: Admission to a program in Administration or Supervision or consent of instructor. Provides on-the-job learning and professional development experiences for future administrative and supervisory personnel. Seminars are held periodically under the direction of the University Coordinator.
Pass/Fail grading.

EDAD 723 Seminar in Legal Issues (3)
Prerequisite: EDAD 620 or EDAD 680.
Provides research skills for intensive investigation of specific, current legal issues affecting the operation of educational institutions.

EDAD 760 Advanced Doctoral Seminar in Educational Leadership (1)
Prerequisite: EDAD 700 and admission to the Ed.D. program.
Provides advanced and intensive investigation of specific and current management topics and issues affecting the operation of educational institutions.

EDAD 780 Problem Analysis in Educational Leadership I (3)
Prerequisites: EDFD 601, EDFD 700, 3rd Research/Statistics Course, and EDFD 730.
Doctoral level study of approaches to analyzing and solving contemporary problems encountered by educational administrators and leaders in such administrative areas as: personnel recruitment and selection, law, budgeting and finance, staff development, operational and strategic planning, policy formulation, diversity and multiculturalism, instructional leadership, and acquisition and use of technology for administrative purposes.

EDAD 781 Problem Analysis in Educational Leadership II (3)
Prerequisite: EDAD 780
Doctoral level study and application of approaches for investigating research-based and practice-based problems in educational administration and leadership. Extends expertise gained in EDAD 780 through analysis and application of problem solving and analytical approaches to administrative problem areas selected by the student. The problem areas addressed may include but are not limited to: budgeting and finance, staff development, operational and strategic planning, law, educational policies, policy formulation, diversity and multiculturalism, instructional leadership, and acquisition and use of technology for administrative purposes.

EDAD 795 Doctoral Research (1-15)
Prerequisite: Successful completion of Comprehensive Examination.
Note: Cross-listed with EDFD, ECPY, EDSP, EDUC 795.
Examination and admission to candidacy for the doctoral degree.

EDAD 796 Research Literature (1-6)
For Ed.S. candidates only. Culminating paper for specialist in education degree. By arrangement with advisor.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Anatomical Sciences and Neurobiology (5204-ASNB)

ASNB 601 Gross Anatomy (8.5)
Prerequisite: Permission from course director at least two weeks before beginning of course.
Primarily a laboratory course. Major emphasis is upon cadaver dissection, but lectures, group discussions, informal laboratory conferences, demonstrations, X-ray presentations are frequent. Correlation of function with structure is stressed in all areas. See Medical School Freshman Schedule for time.

ASNB 603 Microscopic Anatomy (6)
Prerequisite: Permission from course director at least two weeks before beginning of course.
Human microscopic anatomy is presented as an integrated study of cells, basic tissues, and organ systems. The classical light microscopic approaches are supplemented by information derived from electron microscopy. Mixture of lectures, labs and self-instruction . See Medical School Freshman Schedule for time.

ASNB 605 Human Embryology (2.5)
Prerequisite: Permission from course director at least two weeks before beginning of course.
Normal and abnormal human embryogenesis and organogenesis are presented through lectures and demonstrations. Special lectures emphasize the cause and treatment of malformations. Second quarter. See Medical School Freshman Schedule for time.

ASNB 606 Anatomy Seminar (1)
Presentations and discussions of individual research or topics of current anatomical interest throughout the year.

ASNB 611 Methods in Neurobiology (3)
Prerequisite: Consent of instructor
An introduction to the methods used to study the nervous system through a combination of didactic sessions and demonstration and/or hands-on experiences. Topics may include cell and tract labelling, electrophysiology, protein blotting and immunohistochemistry, cell culture microscopy, and basic molecular biology.

ASNB 614 Molecular Neuroscience (4)
Prerequisite: Consent of instructor.
Structure and function of the nervous system from a molecular perspective. Includes description of membrane proteins, channels and receptors in neurons and glia. Discussion of the role of such molecular structures in the nervous system.

ASNB 615 Neurosciences (8)
Prerequisite: Permission from course director at least two weeks before the course begins.
Unified presentation of neuroanatomy and neurophysiology of the nervous system including discussion of clinical applications.

ASNB 616 Special Projects in Anatomy (1-15)
Prerequisite: Permission from instructor at least two weeks before beginning of course.
This course, to be arranged to fit individual needs, is intended primarily to accommodate students whose special background exempts them from all or part of ANAT 601, 603, 605, 615; it may also be offered for others who have special needs for other advanced training. May be offered each quarter. Schedule to be arranged.

ASNB 617 Seminar on Developmental Neurobiology (3)
Prerequisite: ASNB 615 or consent of instructor.
Covers neural development from neurulation through development of integrated systems. Emphasis will be on the cellular level.

ASNB 619 Original Investigations (1-15)

ASNB 620 Thesis (1-6)

ASNB 665 Techniques of Biological Electron Microscopy (3)
Prerequisite: Consent of department required.
This course aims to develop in the student reasonable proficiency in specimen preparation techniques and operation of the electron microscope as a foundation for the pursuit of electron microscopic biomedical investigations. Limited to four students. Second Semester.

ASNB 667 Advanced Cell Biology (3)
Prerequisite: One quarter of graduate level biochemistry or consent of instructor.
Note: Cross-listed with BIOC 667, BIOL 667 and MBIO 667.
An advanced treatment of cell structure and function including: membranes, organelles, cytoskeleton, cellular communication, and control of cell growth.

ASNB 670 Dental Gross Anatomy (6)
Prerequisite: Oral Biology major or related field.
A laboratory course of dissection of the human body emphasizing head and neck anatomy in detail. Fall.

ASNB 671 General and Oral Histology (5)
Prerequisite: Oral Biology major or related field.
Provides knowledge of histological structure including ultrastructure of tissues and organs. Oral structures presented in detail.

ASNB 678 Current Topics in Neuroanatomy (1.5)
Prerequisite: Medical neuroanatomy.
The first part of the course will consist of a series of lectures dealing with the various experimental methods used in the study of the nervous system. The major portion of the course will be devoted to student seminars and discussions of current topics in neuroanatomy. Third quarter. 3 hr. lect. per week; Alternate years; 1996-97; 1998-99.

Anthropology (0307-ANTH)

ANTH 546 Problems in Urban Anthropology (3)
Prerequisite: Introduction to Cultural Anthropology (ANTH 201), or consent of the instructor.
An examination of one or more current issues regarding urbanization and development in traditional and modern societies.

ANTH 548 Special Topics in Cultural Anthropology (3)
Prerequisite: Consent of instructor.
An examination of one or more specific areas of social-cultural anthropology. Details announced each semester.

ANTH 549 Special Topics in Archaeology (3)
Prerequisite: Introduction to Biological Anthropology (ANTH 202) and Introduction to Archaeology (ANTH 305), or consent of instructor.
An examination of specific areas of archaeology. Details announced each semester.

ANTH 601 Special Topics in Anthropology (3)
Prerequisite: Consent of instructor or department chair.
Outlines vary as to area of expertise of instructors; objectives aim at the maximum of staff utilization and meeting program needs within the University which call for studies in anthropology as that discipline interrelates with other special knowledge. Students may take the course as often as topics vary, up to 6 hours.

ANTH 604 Problems in Social Anthropology (3)
Prerequisite: Consent of instructor.
Intensive examination of selected topics in social anthropology focusing on current theories and methodologies. Alternate Fall semesters.

ANTH 606 Regional Analysis (3)
Prerequisite: Consent of instructor.
Intensive analysis of socio-cultural data of a particular region of the world (such as Africa, pre-Columbia, Contemporary America, or Latin America) and method and theory pertaining to that region. May be repeated up to six hours if no duplication is involved. Alternate Fall semesters.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Art (Creative) (0309-ART)

ART 501-502 Studio Practice in Painting (3-3)
Prerequisite: Advanced Painting (ART 401-402); ART 501 for 502.
Experimentation in individual problems in painting related to our times. 6 hours in studio each week.

ART 503 Art Workshop (0.5-3 each)
Prerequisite: Consent of instructor.
An intensive workshop in a specialized area of art.

ART 507 Art Education (3)
Prerequisite: M.A.T. candidacy in elementary education or consent of instructor.
Discussion to establish philosophy, and studio to explore projects and media appropriate for kindergarten through 8th grade.

ART 508 Art Education Methods and Research I (3)
Prerequisite: Fine arts majors only.
Art education methods and current research readings to satisfy Kentucky certification requirements for teachers of art in grades K-6.

ART 509 Graphic Design V (3)
Prerequisite: Advanced Graphic Design I & II (ART 409-410)
Problems emphasizing visual identity systems and their application in diverse media and formats.

ART 510 Graphic Design VI (3)
Prerequisite: Advanced Graphic Design I & II (ART 409-410)
Graphic design applied to three-dimensional systems such as packaging, architectural and exhibition design.

ART 511-512 Studio Practice in Photography (3-3)
Prerequisite: Advanced Photography I & II (ART 411-412); ART 511 for 512.
Advanced work in photography with emphasis on individual problems. 6 hrs. in studio each week.

ART 515-516 Advanced Drawing Concepts (3-3)
Prerequisite: Advanced Drawing I & II (ART 415-416); ART 515 for 516.
Individual problems stressing optional media and approaches development of personal imagery and concepts. 6 hrs. in studio each week.

ART 517 Special Problems in Drawing (3)
Prerequisite: Intermediate Drawing I & II (ART 315-316) or consent of instructor.
Intensive study of selected problems approached through drawing: landscape drawing, cliche'-verre, etc. Credit not applicable to area of concentration. May be repeated once under different subtitle.

ART 518 Art Education Methods and Research II (3)
Prerequisite: Fine Arts majors only.
Art education methods and current research readings to satisfy Kentucky certification requirements for teachers in grades 7-12.

ART 519-520 Studio Practice in Sculpture (3-3)
Prerequisite: Advanced Sculpture (ART 419-420).
Individual projects: experimentation with a variety of media. 6 hrs. in studio each week.

ART 525-526 Studio Practice in Printmaking (3-3)
Prerequisite: Advanced Printmaking (ART 425-426); ART 525 for 526.
Advanced woodcut, wood engraving, metal engraving, etching, serigraph and lithography. 6 hrs. in studio each week.

ART 531-532 Studio Practice in Ceramics (3-3)
Prerequisite: Advanced Ceramics (ART 431-432) and consent of instructor.
Individual technical problems, experimentation and specialization in various techniques suited to the personal interpretation of the student. 6 hrs. in studio each week.

ART 534 Independent Study (1-3)
Prerequisite: Consent of instructor.

ART 581 Advanced Fiber-Surface Design I (3)
Prerequisite: Intermediate Fiber-Surface Design (ART 481-482).
Formulation and execution of selected problems. Six hours in studio each week.

ART 582 Advanced Fiber-Surface Design II (3)
Prerequisite: Intermediate Fiber-Surface Design (ART 481-482).
Formulation and execution of selected problems. Six hours in studio each week.

ART 583 Advanced Fiber-Construction I (3)
Prerequisite: Intermediate Fiber-Construction (ART 483-484).
Formulation and execution of selected problems. Six hours in studio each week.

ART 584 Advanced Fiber-Construction II (3)
Prerequisite: Intermediate Fiber-Construction (ART 483-484).
Formulation and execution of selected problems. Six hours in studio each week.

ART 590-591 Special Problems in Studio Art (3-3)
Studio practice related to a particular theme, medium or combination of media outside the scope of established departmental curriculum. May be repeated with different subtitles to a maximum of 12 hours.

ART 601 Workshop in Painting (3)
Prerequisite: Four semesters of undergraduate painting.
Concentrated study in advanced contemporary painting problems, with strong emphasis on independent visual thought. May be repeated but no more than 18 hours can be credited to M.A.

ART 619 Workshop in Sculpture (3)
Prerequisite: Four semesters of undergraduate sculpture.
Concentrated study of sculptural problems and techniques. May be repeated but no more than 18 hours can be credited to M.A.

ART 625 Workshop in Printmaking (3)
Prerequisite: Four semesters of undergraduate printmaking.
Concentrated study leading to independent visual thought. May be repeated but no more than 18 hours can be credited to M.A.

ART 633 Workshop in Ceramics (3)
Prerequisite: Consent of instructor.
Advanced individual projects and experimentation. May be repeated but no more than 18 hours can be credited to M.A.

ART 643-644 Independent Study (1-15)
Prerequisite: Consent of instructor.
Credit according to achievement.

ART 645-646 Thesis Guidance (3-3)

ART 682 Workshop in Fiber (3)
Prerequisite: Consent of instructor.
Concentrated study of fiber problems and techniques with emphasis on development of student's individual direction. May be repeated, but no more than 18 hours can be credited to M.A.

Art History (0311-ARTH)

ARTH 540 Approaches to Study of Art History (3)
Prerequisite: One undergraduate art history survey course or consent of instructor.
Significant approaches to problems of style and iconography. Introduction to research methods and historiography.

ARTH 542 Special Topics (3)
Content to be indicated in schedule of courses. May be taken with four different subtitles to a maximum of 12 hours.

ARTH 543 Independent Study (1-3)
Prerequisite: Consent of instructor.

ARTH 544 Pan-African Art: Form and Content (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with PAS 581.
Similarities and differences in African-American folk art, Caribbean folk art, and traditional African art.

ARTH 546 History of Ceramics (3)
Prerequisite: Consent of instructor.
Survey of the history of ceramics. Emphasis on the evolution of technical innovations and styles.

ARTH 547-548 Museum Methods (3-3)
Prerequisite: Major in art history and consent of instructor.
Advanced work in museum education at the J. B. Speed Art Museum or with departmental collections.

ARTH 551 Studies in Ancient Art (3)
Prerequisite: Greek Art and Architecture (ARTH 351), Aegean Art and Architecture (ARTH 352), Roman Art and Architecture (ARTH 353), or consent of instructor. Selected topics in ancient art and architecture.

ARTH 552 Ancient Painting (3)
Prerequisite: Greek Art and Architecture (ARTH 351), Aegean Art and Architecture (ARTH 352), Roman Art and Architecture (ARTH 353), or consent of instructor.
A study of mural painting from the ancient cultures of Egypt, the Aegean, Greece and Italy.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

ARTH 553 Ancient Cities (3)
Prerequisite: Greek Art and Architecture (ARTH 351), Aegean Art and Architecture (ARTH 352), Roman Art and Architecture (ARTH 353), or consent of instructor.
A study of the development of the city in the Mediterranean region from prehistoric times to the late Roman Empire.

ARTH 561 Studies in Medieval Art (3)
Prerequisite: One 300-level course in Medieval art or architecture, or consent of instructor.
Studies in the art and architecture of the Middle Ages emphasizing a synthesis of the arts in a particular period or place.

ARTH 562 Medieval Architecture (3)
Prerequisite: One 300-level course in Medieval art or architecture, or consent of instructor.
The development of medieval architecture in Eastern and Western Europe with emphasis on the interrelationships between various countries.

ARTH 563 Medieval Figural Arts (3)
Prerequisite: One 300-level course in Medieval art or architecture, or consent of instructor.
The development of the figural arts in the Middle Ages with emphasis on a particular period, geographical area, or medium.

ARTH 571 Studies in Renaissance Art (3)
Prerequisite: One 300-level course in Renaissance art or consent of instructor.
Study of a major phase of painting or sculpture, fifteenth or sixteenth century, in Italy or Northern Europe, with emphasis on sources and development of style.

ARTH 574 History of Prints (3)
Prerequisite: 12 hours of art history or consent of instructor.
Origin and development of woodcut, engraving, etching, aquatint, lithography, and serigraphy; major artists using these techniques .

ARTH 581 Studies in Baroque Art (3)
Prerequisite: Baroque Art (ARTH 381), Eighteenth Century Art and Architecture (ARTH 382), Renaissance and Baroque Architecture (ARTH 383), or consent of instructor.
Study of one of the leading artists of the seventeenth and eighteenth centuries, such as Bernini, Borromini, Tiepolo, Velazquez, Rembrandt, Rubens, or Watteau

ARTH 591 Studies in Modern Art (3)
Prerequisite: One 300-level course in Modern art or consent of instructor.
Reconstruction and interpretations of modern artistic aspirations through study of sources and documents by artists, critics and historians.

ARTH 593 Studies in Modern Architecture (3)
Prerequisite: One 300-level course in Modern architecture or consent of instructor.
Principal forms and theories of urban and building design in relation to social forces in modern Europe and America.

ARTH 595 Studies in American Art (3)
Prerequisite: One 300-level course in American art or architecture or consent of instructor.
Studies in American architecture, city planning, decorative arts, painting, or sculpture, from colonial times to present.

ARTH 597 Studies in Photographic History (3)
Prerequisite: Consent of instructor.
The aesthetic development of photography, with emphasis on U.S. photographers and contemporary issues relevant to the medium.

ARTH 598 Studies in the History of Landscape Architecture (3)
Prerequisite: Consent of instructor.
Special problems and advanced research in garden history and the development of spatial planning.

ARTH 599 Urban Design (3)
Prerequisite: One 300-level course in architectural history or consent of instructor.
Historical survey of city design and planning philosophies from ancient times to the present, with emphasis on Europe and the United States.

ARTH 641 Seminar in Art History (3)
Prerequisite: Consent of instructor.
Exploration of core problems in iconography, formal analysis, criticism, or historiography.

ARTH 643-644 Independent Study (1-12)
Prerequisite: Consent of instructor.
Credit according to achievement.

ARTH 645-646 Thesis Guidance (3-3)

ARTH 647 Teaching Internship (2)
Prerequisite: Consent of instructor.
Development and practice of teaching skills through work with an individual instructor in an undergraduate course.

ARTH 651 Seminar in Ancient Art (3)
Prerequisite: Consent of instructor.
Advanced study on selected topics in ancient art and architecture.

ARTH 661 Special Problems in Medieval Art (3)
Prerequisite: Consent of instructor.

ARTH 671 Special Problems in Renaissance Art (3)
Prerequisite: Consent of instructor.

ARTH 681 Special Problems in Baroque Art (3)
Prerequisite: Consent of instructor.

ARTH 691 Special Problems in Modern Art (3)
Prerequisite: Consent of instructor.

ARTH 693 Special Problems in Modern Architecture (3)
Prerequisite: Consent of instructor.

ARTH 695 Special Problems in American Art (3)
Prerequisite: Consent of instructor.

ARTH 699 Special Problems in Urban History (3)
Prerequisite: Consent of instructor.
Advanced research in urban history from an architectural standpoint.

ARTH 745 Dissertation Research (1-12)
Prerequisite: Permission of dissertation director.

Audiology (5207-AUDI)

AUDI 600 Anatomy and Physiology of the Auditory-Vestibular System (4)
Intensive and advanced study of recent developments in auditory-vestibular anatomy and physiology. Includes gross aspects of the temporal bone and cytoartchetectonics of the labyrinth. Laboratory exercises reinforce didactic material.

AUDI 602 Audition and Psychoacoustics (3)
Study of the production, propagation and parameters of sound. Bio-acoustic aspects of audition. The acoustics of speech perception in normal and disordered auditory systems. Classical presentation of psycho-acoustics with special reference to disordered auditory systems. Topics include methods of threshold determination, equal loudness contours, difference limen for intensity and frequency, aural harmonics, physiologic tuning curves, etc.

AUDI 604 Essential Techniques in Audiometry (3)
The epidemiology of hearing loss. Basic tests of auditory function including pure tone audiometry, speech audiometry and imminence measurements. Principles of masking. Pathologic correlates of hearing loss.

AUDI 610 Clinical Observation 1 and II (1)
A two-semester sequence of directed observation in the audiology clinic. Developing critical observation skills. Interviewing patients, eliciting a complete history, preparing written technical reports and referral communications and record keeping. Includes observations in various outside practicum sites, surgery clinics, schools agencies and hospitals. 1 credit hour each semester.

AUDI 612 Pathology of the Auditory-Vestibular System (3)
Study of pathology of the auditory-vestibular system with special reference to clinical symptomatology. Etiology, epidemiology, pathogenesis, diagnosis and treatment of auditory-vestibular disease and injury.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

AUDI 614 Speech-Language Pathology for the Audiologist (3)
An overview of normal and disordered speech and language development with special reference to the effects of hearing loss. Central auditory processing disorders. Adult communication disorders. Making appropriate referrals for evaluation and treatment.

AUDI 616 Embryology and Genetics of the Auditory Systems (2)
Study of the anatomical development of the auditory system with special reference to endogenous (genetic) and exogenous causes of hearing loss. Genetic syndromes affecting the auditory system.

AUDI 618 Instrumentation and Electronics in Audiology (2)
Basics of electronic circuitry, especially in audiometric instrumentation and amplification systems. Includes instrumentation calibration, trouble-shooting and repair. Analog, analog-digital hybrid, and digital signal processing.

AUDI 620 Clinical Clerkship I and II (2)
Introductory level clinical audiometry under the aegis of an experienced clinician. Mastery of basic skills such as threshold determination for pure tones and speech stimuli, masking, auditory discrimination measurements, tympanometry, calibration, etc. 2 credit hours each semester.

AUDI 622 Electrophysiologic Techniques in Audiology I (3)
Principles of biologic potentials, signal averaging, amplification and filtering. Clinical utility of various acoustic, visual and somatosensory measurements. Recording and interpreting the auditory evoked potentials.

AUDI 624 Amplification Technology (3)
Principles of amplification electronics, electroacoustics and acoustics in aural (re)habilitation. Real ear measurements. ANSI specifications. Earmold acoustics. Modifying acoustical parameters.

AUDI 625 History of Audiology (1)
A study of the development and history of audiology as a discipline. Special emphasis on technological innovations beginning in the vacuum tube era and continuing through digital signal processing. The evolution of the clinical evaluation and treatment strategies.

AUDI 628 Differential Diagnosis in Audiology (3)
Interpreting the audiologic test battery. Integrating audiologic test results with other diagnostic procedures (i.e., radiologic, neurologic, pathologic, etc). Advanced concepts in test construction, delivery and interpretation. Using test results to plan remediation.

AUDI 630 Amplification Selection and Fitting (3)
Determining candidacy and benefit from amplification. Selecting appropriate amplification systems and options including assistive listening devices and implantable technologies. Review of current technologies and their clinical efficacy. Introduction to the business aspects of hearing aid dispensing.

AUDI 632 Professional Issues in Audiology (1)
Overview of the social, political and economic climate in hearing health care delivery. Basic and advanced strategies for practice management and development. Interprofessional relationships and responsibilities. Supervision of other professionals.

AUDI 634 Electrophysiologic Techniques in Audiology II (3)
A continuation of AUDI 614. Advanced concepts in electrophysiologic measurement and interpretation with special emphasis on evaluation of the vestibular system and intra-operative monitoring.

AUDI 635 Audiology Internship I and II (3)
A two-semester sequence of supervised patient care in a variety of sites closely associated with the university. Student clinicians will assume increasing responsibility for the full range of basic and intermediate level audiologic procedures and interpretation. 3 credits each semester.

AUDI 636 Pediatric Audiology (3)
Hearing disorders and audiologic techniques in the pediatric population. Topics include identification audiometry (screening protocols), childhood aural pathologies and treatment options, behavioral audiometry, electrophysiologic techniques, and current management options.

AUDI 638 Communication Evaluation and Training in the Pediatric Population (3)
Overview of current management options for the (re) habilitation of children with hearing loss. Review of the literature pertaining to all facets of aural rehabilitation in the context of communication theory. Principles of speech reading, auditory training and case management for individuals and groups

AUDI 640 Special Topics in Audiology (1-3)
An elective course designed to focus on specific topics in audiology. Subject matter to be determined by the faculty and students. May be repeated to a limit of 6 credits.

AUDI 642 Gerontologic Audiology (2)
A broad study of the human aging process at the cellular, organ, system and social levels. Putting the hearing-impaired elderly in a social context. Special emphasis on the aging of the auditory system and its consequences for case management.

AUDI 644 Communication Evaluation and Training in the Geriatric Population (3)
A continuation of AUDI 624. Includes a thorough review of the literature and practical applications of remedial strategies for the hearing-impaired adults.

AUDI 646 Medical Audiology (3)
Intensive study of the medical correlates of hearing impairment including medical/surgical intervention, pharmacology and ototoxicity, the effects of sedation on electrophysiologic tests and the pathogenesis of aural pathologies.

AUDI 650 Graduate Audiology Practicum I and II (6)
Advanced clinical practicum in audiology conducted in a variety of settings and with a range of hearing-impaired populations. Trainees take full responsibility for patient care under the general and administrative supervision of the faculty or preceptor. 6 credits each semester.

AUDI 652 Industrial Audiology (2)
Focuses on the effects of noise on the auditory system, noise measurement and abatement, hearing conservation programming, OSHA standards, etc. The medical-legal aspects of hearing impairment. Topics include worker's compensation regulations, determining degree of hearing handicap, reconstructing damage scene, developing and providing expert testimony and depositions.

AUDI 654 Neuroanatomy/ Neurophysiology and Central Auditory Processing (3)
Human neuroanatomy and physiology of the central and peripheral nervous systems. Special study of the central auditory and vestibular connections. Review of current literature on normal and pathological central auditory processing.

AUDI 656 Practice Management in Audiology (3)
Organizing, managing and expanding an audiologic practice. Determining costs and fees, accounts management, quality assurance, third-part reimbursement, contracting for services, demographic trends, business and professional ethics, professional liability, marketing, certification and licensure.

AUDI 660 Investigation in Audiologic Practice (1-3)
Directed course in which students investigate specific clinical problems in audiology. Will include research on a topic of clinical or professional interest (i.e., quality assurance, service development, reimbursement issues). Investigation eventuates in a publishable paper. May be repeated to a maximum of 6 credits.

AUDI 670 Clinical Residency in Audiology I, II and III (6)
Advanced clinical practicum under the general direction of a faculty member or preceptor in an external practicum site. Each residency is custom-tailored to the interests of the trainee. May involve relocation or travel. 6 credits each semester.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Biochemistry and Molecular Biology (5210-BIOC)

Note: *Biochemistry courses are scheduled according to the Health Sciences calendar.*

BIOC 545 Biochemistry I (3)
Prerequisite: Organic Chemistry II (CHEM 342)
Note: Cross-listed with CHEM 545.
Chemistry of amino acids, peptides, proteins, nucleotides and nucleic acids; methods of analysis and laboratory synthesis; enzyme properties, kinetics, and control mechanisms; ligand binding. Credit may not be earned in both 545 and 645. Credit may not be applied toward an advanced degree in Chemistry.

BIOC 547 Biochemistry II (3)
Prerequisite: BIOC 545/CHEM 545
Note: Cross-listed with CHEM 547.
Cellular metabolism of carbohydrates, lipids, amino acids and nucleotides; RNA, DNA and protein biosynthesis; biomembrane phenomena. Credit may not be earned in both 547 and 647. Credit may not be applied toward an advanced degree in Chemistry.

BIOC 602 Medical Biochemistry (7.5)
Prerequisite: Consent of instructor.
Structure, function, synthesis and catabolism of biomolecules, with special emphasis on mammalian systems. Biological mechanisms for the control of metabolism and physiological function and the influence of nutrition and disease states on these processes.

BIOC 603 Special Topics in Biochemistry (1-4)
Prerequisite: BIOC 645 & 647 (may be concurrent), or consent of instructor.
Arranged to fit individual needs on topics of current interest or to receive some advanced training or conduct research project.

BIOC 605 Protein Biochemistry (2)
Prerequisite: BIOC 645, 681 (recommended), or consent of instructor.
Structure and function of proteins, including protein folding.

BIOC 606 Biochemistry Seminar (1)
Both Fall and Spring semesters.

BIOC 611 Biochemical Methods I (1-4)
Prerequisite: BIOC 645 (may be concurrent) or consent of instructor.
Purification and characterization of an enzyme to acquaint the student with theoretical and practical aspects of biochemical methods including centrifugation, spectroscopy, chromatography, and electrophoresis.

BIOC 612 Biochemical Methods II (1-4)
Prerequisite: BIOC 611, 668 (may be concurrent) or consent of instructor.
Involves a series of lecture-demonstrations covering current techniques in molecular biology. It will include participation in one miniproject in molecular genetics directed by participating faculty.

BIOC 613 Biochemistry Laboratory (2-4)
The course will consist of participation in the research programs of two laboratories in the department. A half-semester will be devoted to each laboratory.
Pass/Fail grading.

BIOC 619 Research (1-15)

BIOC 640 Principles of Biochemistry (5)
Prerequisite: Consent of instructor.
Covers general aspects of biochemistry with special emphasis given to areas applicable to dentistry. Topics include protein structure and function; chemistry and metabolism of carbohydrates, lipids, amino acids, and nucleotides; molecular genetics; nutritional biochemistry; calcification; and molecular endocrinology. Clinical conferences keyed to current lecture topics are presented by clinical faculty.
Spring.

BIOC 641 Advanced Eukaryotic Genetics (4)
Prerequisite: Consent of instructor.
Note: Cross-listed with BIOL 641
Familiarizes advanced students with classical, molecular and quantitative genetics. Subjects covered include gene mapping in model systems and humans as well as genetic manipulation of model organisms.

BIOC 645 Advanced Biochemistry I (4)
Prerequisite: Organic Chemistry II (CHEM 342).
Note: Cross-listed with CHEM 645.
Chemistry of amino acids, peptides, proteins, nucleotides and nucleic acids; methods of analysis and laboratory synthesis; enzyme properties, kinetics, and control mechanisms; ligand binding. Lectures concurrent with CHEM 545; one added lecture hour each week covers advanced topics. Credit may not be earned in both 545 and 645.

BIOC 647 Advanced Biochemistry II (4)
Prerequisites: BIOC 645/ CHEM 645.
Note: Cross-listed with CHEM 647.
Cellular metabolism of carbohydrates, lipids, amino acids and nucleotides; RNA, DNA and protein biosynthesis; biomembrane phenomena. Lectures concurrent with CHEM 547; one added lecture hour each week covers advanced topics. Credit may not be earned in both 547 and 647.

BIOC 650 Enzymology (3)
Prerequisite: BIOC 645 and 647, or consent of instructor.
Enzyme kinetics, including Michaelis-Menten kinetics, inhibition, activation, and allosteric regulation. Metabolic regulation, theories of enzyme mechanism, current understanding of specific enzymes and coenzymes. Second semester, third and fourth quarters.

BIOC 660 Molecular Endocrinology (2)
Prerequisite: BIOC 645 and 647, or consent of instructor.
Note: Cross-listed with Medical Elective BIOC 860.
Comprehensive course integrating molecular aspects of hormone action with biologic responses in target tissues.
Particular emphasis is placed on the evolution of experimental progress, application of concepts and techniques, and the role of molecular endocrinology in clinical management of endocrine-related disease in this rapidly emerging field.

BIOC 667 Advanced Cell Biology (3)
Prerequisite: One quarter of graduate level biochemistry or consent of instructor.
Note: Cross-listed with ASNB 667, BIOL 667, MBIO 667 and VISC 667.
An advanced treatment of cell structure and function including: membranes, organelles, cytoskeleton, cellular communication, and control of cell growth.

BIOC 668 Molecular Biology (3)
Prerequisite: BIOC 645 and 647, or consent of instructor.
Molecular aspects of the structure and function of cells with emphasis on mechanisms and regulation of gene expression.

BIOC 675 Biochemistry of Cancer (2)
Prerequisites: BIOC 645 and 647, or consent of instructor.
Traditional areas of carcinogenesis will be described. Lectures in the areas of drug resistance, growth factors, oncogenes, tumor suppressor genes and metastasis will provide the background for understanding of the expression and regulation of neoplasms in mammals.

BIOC 681 Physical Biochemistry (3)
Prerequisite: Physical chemistry or consent of instructor.
Thermodynamics and biochemistry, multiple equilibria, hydrodynamic properties of biopolymers, absorption and fluorescence spectroscopy, and optical properties of proteins and nucleic acids.

Biology (0314-BIOL)

BIOL 500 Plant Growth and Development (3)
Prerequisite: Biology of Plants (BIOL 242), Biology of Plants Lab (BIOL 243), and Cellular and Molecular Biology (BIOL 329) or consent of instructor.
Selected topics from the field of developmental and experimental botany. Lectures, discussions, and student presentations on current and classical literature. Credit may not be earned in both 500 and 600.

BIOL 503 Protozoology (3)
Prerequisite: Invertebrate Zoology (BIOL 305) or consent of instructor.
Introduction to the systematics, morphology, ecology, and life cycles of the unicellular animals. Credit may not be earned in both 503 and 603. 2 hrs. lect., 2 hrs. lab.

BIOL 506 Freshwater Invertebrates (4)
Prerequisite: Invertebrate Zoology (BIOL 305) or consent of instructor.
Functional biology, ecology behavior, and classification of freshwater invertebrates, with an emphasis on non-insect taxa. Credit may not be earned in both 506 and 606.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

BIOL 507 Aquatic Entomology (3)
Prerequisite: Introductory Insect Biology (BIOL 382) or Limnology (BIOL 522).
Collection, preparation, identification, and study of insects in various lentic and lotic aquatic environments, and processing of resulting data. Credit may not be earned in both 507 and 607. 2 hrs. lect., 2 hrs. lab. or field.

BIOL 509 Methods and Principles of Systematic Zoology (3)
Prerequisite: Organismic Biology (BIOL 211) and Biology of Populations (BIOL 212).
Study of taxonomic theory and methods of nomenclature in zoology. Credit may not be earned in both 509 and 609. 3 hrs. lect.

BIOL 510 Zoogeography (3)
Prerequisite: The Diversity of Animals (BIOL 240) and The Diversity of Animals: Laboratory (BIOL 241).
Distribution of animals on a worldwide basis, with emphasis on the vertebrates. Credit may not be earned in both 510 and 610. 3 hrs. lect.

BIOL 512 Endocrinology (3)
Prerequisite: Principles of Physiology (BIOL 465).
Chemical regulation in animals. Credit may not be earned in both 512 and 612.

BIOL 513 Comparative Animal Physiology (3)
Prerequisite: Comparative Vertebrate Anatomy (BIOL 347), Principles of Animal Physiology (BIOL 465).
Adaptations of basic physiological functions across a broad spectrum of organisms. Credit may not be earned in both 513 and 613.

BIOL 514 Ornithology (3)
Prerequisite: Comparative Vertebrate Anatomy (BIOL 347).
Biology, systematics, and distribution of birds; field and laboratory techniques stressed. Credit may not be earned in both 514 and 614. 2 hrs. lect., 2 hrs. lab.

BIOL 515 Environmental Physiology (3)
Prerequisite: Consent of instructor.
Comparative biological and biochemical mechanisms of adaptation to ecological and environmental extremes in eukaryotic organisms. Credit may not be earned in both 515 and 615.

BIOL 516 Genetic Manipulations with Bacteria and Fungi (4)
Prerequisite: Genetics and Molecular Biology (BIOL 230)/Genetics and Molecular Biology: Laboratory (BIOL 231), Bacteriology (BIOL 355), Introductory Biology (BIOL 357), or equivalent experience and consent of instructor. Recommended BIOL 542.
An advanced course in laboratory techniques to study bacteria and fungi at the molecular level. Emphasis on up-to-date in vivo and in vitro techniques. Credit may not be earned in both 516 and 616.

BIOL 518 Large River Ecosystems (3)
Prerequisite: Organismic Biology (BIOL 211) and Biology of Populations (BIOL 212); BIOL 563/663 recommended or consent of instructor.
Fundamental ecosystem properties and humans' regulation, use and pollution of large rivers are explored. Lectures and occasional Saturday field trips. Credit may not be earned in both 518 and 618.

BIOL 519 Ichthyology (3)
Prerequisite: Comparative Vertebrate Anatomy (BIOL 347).
Introduction to anatomy, physiology, ecology, distribution, economic importance, and classification of major groups and representative local species of fish. 1 hr. lect., 4 hrs. lab and/or field.

BIOL 520 Tropical Marine Biology (3)
Prerequisites: Marine Biology (BIOL 320) or consent of instructor.
Detailed study of the marine ecology, fauna, and flora associated with islands in the Caribbean. Will emphasize coral reefs, mangroves, and marine grass beds. Ability to scuba dive or snorkle on coral reefs is required (the former recommended). Involves lectures in Louisville and on the island and field work in the Caribbean. Students must pay significant travel expenses in addition to tuition. Reservation for the course must be made early in the semester preceding the course.

BIOL 521 Stream Ecology (3)
Prerequisite: Biology of Populations (BIOL 212).
Introduction to interactions among algae, invertebrates, fish, and their environments in streams. Focus on basic research methods with field and laboratory projects. 2 hrs. lect., 2 hrs. lab or field.

BIOL 522 Aquatic Ecology (4)
Prerequisite: Introduction to Ecology (BIOL 301)
Ecological processes occurring in aquatic environment. Primary focus will be on lakes and reservoirs with some discussion of stream, river and wetland processes. Credit may not be earned in 522 and 622. 2 hrs. lect., 4 hrs. lab or field.

BIOL 523 Plant Physiology (4)
Prerequisite: Biology of Plants (BIOL 242), Biology of Plants Lab (BIOL 243) and Cellular and Molecular Biology (BIOL 329).
Selected topics in plant physiology, with emphasis on growth and reproduction. Laboratory and greenhouse experiments are performed. Credit may not be earned in both 523 and 623. 2 hrs. lect., 4 hrs. lab.

BIOL 525 Aquatic Botany (4)
Prerequisite: Classification & Distribution of Plants (BIOL 300), Plant Morphology (BIOL 325), or consent of instructor.
Identification, classification, and ecology of freshwater algae, aquatic bryophytes, and vascular plants. Field work is emphasized. Credit may not be earned in both 525 and 625. 2 hrs. lect., 4 hrs. lab. or field.

BIOL 526 Algal Biology (4)
Prerequisite: Organismic Biology (BIOL 211) and Biology of Populations (BIOL 212) or consent of the instructor.
Identification, classification and ecology of freshwater algae are studied with surveys and experiments in the laboratory and in local lakes and streams. Credit may not be earned in both 526 and 626. 2 hrs. lect., 4 hrs. lab.

BIOL 529 Mammalogy (3)
Prerequisite: Comparative Vertebrate Anatomy (BIOL 347).
Paleontology, systematics, life history, ecology, and distribution of mammals. Field and laboratory research techniques will be stressed. Credit may not be earned in both 529 and 629. 2 hrs. lect., 2 hrs. lab or field.

BIOL 531 Cellular Physiology (4)
Prerequisite: Cellular Biology (BIOL 311).
Functional activities of cells and tissues, with emphasis on basic physical and biochemical properties of living matter. Credit may not be earned in both 531 and 631. 2 hrs. lect., 4 hrs. lab.

BIOL 532 Herpetology (3)
Prerequisite: Comparative Vertebrate Anatomy (BIOL 347).
Biology, systematics, and distribution of reptiles and amphibians, with emphasis on Kentucky species; laboratory and field work on local species. Credit may not be earned in both 532 and 632. 2 hrs. lect., 2 hrs. lab. or field.

BIOL 539 Medical Entomology (3)
Prerequisite: Introductory Insect Biology (BIOL 382) or consent of instructor.
Study of insects and other arthropods that cause pathological conditions in man and domestic animals; life cycles and control of pathogens and vectors. Credit may not be earned in both 539 and 639. 2 hrs. lect., 2 hrs. lab.

BIOL 540 Intermediary Metabolism (3)
Prerequisite: Organismic Biology (BIOL 211) and Cellular Biology (BIOL 311).
An advanced study of methods and metabolic pathways utilized by various organisms under different environmental conditions. Credit may not be earned in both 540 and 640. 3 hrs. lect.

BIOL 542 Gene Structure and Function (3)
Prerequisite: Genetic and Molecular Biology (BIOL 312).
Advanced topics in genetics of prokaryotes and eukaryotes, including chromosome structure and function, and gene regulation. Credit may not be earned in both 542 and 642. 3 hrs. lect.

BIOL 543 Cytogenetics (3)
Prerequisite: Cellular Biology (BIOL 311), Genetic and Molecular Biology (BIOL 312).
Heredity as related to cytogenetical phenomena. Chromosomal variation as a mechanism in evolution and speciation. Credit may not be earned in both 543 and 643. 3 hrs. lect.

BIOL 544 Fisheries Management (4)
Prerequisite: Biology of Populations (BIOL 212).
Principles and techniques of managing freshwater and marine fish stocks for human benefit. Emphasis on adjusting aquatic environments, stock assessment, and population dynamics. Credit may not be earned in both 544 and 644. 2 hrs. lect., 4 hrs. lab. or field.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

BIOL 550 Biostatistics (3)
Prerequisite: Elements of Calculus (MATH 108) or Analytic Geometry & Calculus I (MATH 205); an introductory course in statistics; or consent of instructor.
Application of statistical methods commonly used in life sciences. Emphasis will be on the interpretation of experimental data. Credit may not be earned in both 550 and 650. 3 hrs. lect.

BIOL 555 Microbial Ecology (3)
Prerequisite: Bacteriology (BIOL 355).
Interrelationships between microorganisms and their environments. Credit may not be earned in both 555 and 655. 2 hrs. lect., 2 hrs. lab.

BIOL 557 Industrial and Food Microbiology (3)
Prerequisite: Bacteriology (BIOL 355), Introductory Microbiology (BIOL 357), or consent of instructor.
A study of the involvement of microorganisms with food and in industrial processes. Emphasis on food preservation, food production, and industrial fermentation. Credit may not be earned in both 557 and 657. 2 hrs. lect., 2 hrs. lab.

BIOL 562 Ecosystems Ecology (3)
Prerequisite: Introduction to Ecology (BIOL 301); an advanced ecology course is recommended.
The transformations of matter and energy that link plant, animal and geochemical cycles. Implications for resource management also discussed. Credit may not be earned in both 562 and 662. 3 hrs. lect.

BIOL 563 Population and Community Ecology (3)
Prerequisite: Introduction to Ecology (BIOL 301)
Introduction to population dynamics and species interactions in aquatic and terrestrial ecosystems. Review of underlying ecological theory and its applications for conserving biodiversity. Credit may not be earned in both 563 and 663.

BIOL 568 Conservation Biology (3)
Prerequisite: Genetics and Molecular Biology (BIOL 330), and Introduction to Ecology (BIOL 301)
Theory and practice of conservation. Topics include biodiversity, habitat loss, the effects of habitat changes on populations, and the design and establishment of reserves. Credit may not be earned for both 568 and 668.

BIOL 569 Evolution (3)
Prerequisite: The Diversity of Animals (BIOL 240), The Diversity of Animals: Laboratory (BIOL 241), Introduction to Ecology (BIOL 301), and Introduction to Ecology: Laboratory (BIOL 302).
Offers a comprehensive overview of evolution and provides students with a review of issues that make up this critical discipline.

BIOL 571 Selected Topics (1-4)
Contents to be indicated in schedule of courses.

BIOL 575 Parasitology (4)
Prerequisite: The Diversity of Animals (BIOL 240), The Diversity of Animals: Laboratory, (BIOL 241) and Invertebrate Zoology (BIOL 305).
Basic principles of parasitism; taxonomy, morphology, life cycles, and ecological considerations of the parasitic protozoa, trema todes, cestodes, nematodes, and acanthocephalans. 2 hrs. lect., 4 hrs. lab.

BIOL 584 Interdisciplinary Frameworks in Environmental Science and Technology (3)
Overview of environmental problems in human and ecological health and solutions offered by environmental engineering. Presented through lectures, seminars, and a set of practical experiences. Case studies will emphasize interdisciplinary frameworks for solving environmental problems and sustaining use of resources. Credit may not be earned in both 584 and 684.

BIOL 591 Biology for Teachers I (3)
Prerequisite: For graduate education majors.
Teaching pre-college biology with emphasis on curriculum content, laboratory procedures, and process skills. May not be used to meet requirements for BA, BS, MS, or PhD degrees in biology. 3 hrs. lect.

BIOL 592 Biology for Teachers II (3)
Prerequisite: Must have experience in teaching biology or biological principles in elementary, middle, or secondary schools.
Teaching pre-college biology with emphasis on curriculum content, laboratory procedures, and process skills. May not be used to meet requirements for BA, BS, MS, or PhD degrees in biology. 3 hrs. lect.

BIOL 600 Advanced Plant Growth and Development (4)
Prerequisite: The Diversity of Animals (BIOL 240)/The Diversity of Animals: Laboratory (BIOL 241) or consent of instructor.
Selected topics from the field of developmental and experimental botany. Lectures concurrent with Biology 500; more advanced material through requirement of independent study or project. Credit may not be earned in both Biology 500 and 600.

BIOL 603 Advanced Protozoology (4)
Prerequisite: Invertebrate Zoology (BIOL 305).
The systematics, morphology, ecology, and life cycles of unicellular animals. Lectures concurrent with Biology 503; more advanced material through requirement of independent study or research project. Credit may not be earned in both 503 and 603. 2 hrs. lect., 2 hrs. lab.

BIOL 604 Advanced Biological Electron Microscopy (5)
Prerequisites: Organismic Biology (BIOL 211), Cellular Biology (BIOL 311), one other 300-level course and consent of the instructor.
Theory and application of techniques in transmission and scanning electron microscopy including fixation, embedding, critical point drying, staining, and operation of the electron microscopes. Lectures concurrent with Biology 504; more advanced material through requirement of independent study or research project. Students will undertake group or individual research projects. Independent participation required, including seminar presentation. Credit may not be earned in both 504 and 604. 2hrs. lect., 4 hrs. lab.

BIOL 606 Advanced Freshwater Invertebrates (5)
Prerequisites: Consent of instructor.
Functional biology, ecology, behavior, and classification of freshwater invertebrates, with an emphasis on non-insect taxa. Lectures concurrent with Biology 506; more advanced material through requirement of independent study or research project. Credit may not be earned in both 506 and 606. 3 hrs. lecture; 2 hrs. lab or field.

BIOL 607 Advanced Aquatic Entomology (4)
Prerequisite: Introductory Insect Biology (BIOL 382) or Limnology (BIOL 522).
Collection, preparation, identification, and study of insects in various aquatic environments. Lectures concurrent with Biology 507; more advanced material through requirement of independent study or research project. Credit may not be earned in 507 and 607. 2 hrs. lect., 2 hrs. lab or field.

BIOL 608 Ecological Instrumentation (3)
The theory and practice of modern techniques of measurement in micro- and macro-ecosystems. 3 hrs. lect.

BIOL 609 Advanced Systematic Zoology (4)
Prerequisite: Organismic Biology (BIOL 211) and Biology of Populations (BIOL 212).
Study of taxonomic theory and methods of nomenclature in zoology. Lectures concurrent with Biology 509; more advanced material through requirement of independent study or research project. Credit may not be earned in both 509 and 609. 3 hrs. lect.

BIOL 610 Advanced Zoogeography (4)
Prerequisite: Biology of Populations (BIOL 212).
Distribution of animals on a worldwide basis, with emphasis on the vertebrates. Lectures concurrent with Biology 510; more advanced material through requirement of independent study or research project. Credit may not be earned in both 510 and 610. 3 hrs. lect.

BIOL 612 Advanced Endocrinology (4)
Prerequisite: Principles of Physiology (BIOL 465).
Chemical regulation in animals, primarily mammals. Lectures concurrent with Biology 512; more advanced material through requirement of independent study or research project. Credit may not be earned in both 512 and 612. 3 hrs. lect.

BIOL 613 Advanced Comparative Animal Physiology (4)
Adaptations of basic physiological functions across a broad spectrum of organisms. Lectures concurrent with Biology 513. More advanced material through requirement of independent study or research project. Credit may not be earned in both 513 and 613.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

BIOL 614 Advanced Ornithology (4)
Prerequisite: Comparative Vertebrate Anatomy (BIOL 347).
Biology, systematics, and distribution of birds; field and laboratory techniques stressed. Lectures concurrent with Biology 514; more advanced material through requirement of independent study or research project. Credit may not be earned in both 514 and 614. 2 hrs. lect., 2 hrs. lab.

BIOL 615 Advanced Environmental Physiology (4)
Prerequisite: Consent of instructor.
Comparative biological and biochemical mechanisms of adaptation to ecological and environmental extremes in eukaryotic organisms. Lectures concurrent with Biology 515; more advanced material through requirement of independent study or research project. Credit may not be earned in both 515 and 615.

BIOL 616 Advanced Genetic Manipulations to Study Bacteria and Fungi (5)
Prerequisite: Genetics and Molecular Biology (BIOL 230)/Genetics and Molecular Biology: Laboratory (BIOL 231) or equivalent experience and consent of instructor. Recommended: BIOL 542/642.
An advanced course in laboratory techniques to study bacteria and fungi at the molecular level. Emphasis on up-to-date in vivo and in vitro techniques. Lectures concurrent with Biology 516; more advanced material through requirement of independent study or research project. Credit may not be earned in both 516 and 616.

BIOL 617 Advanced Molecular Biology (4)
Prerequisite: Cellular Biology (BIOL 311) or Genetic & Molecular Biology (BIOL 312), and one semester of organic chemistry.
Nature, production and replication of biological compounds and their relation to structure and function in development; discussion of methodologies. 3 hrs. lect.

BIOL 618 Advanced Large River Ecosystems (4)
Prerequisites: Organismic Biology (BIOL 211) and Biology of Populations (BIOL 212); BIOL 563/663 recommended or consent of instructor.
Fundamental ecosystem properties and human's regulation, use and pollution of large rivers are explored. Lectures and occasional Saturday field trips. Lectures concurrent with Biol 518; more advanced material through requirement of independent study or research project. Credit may not be earned in both 518 and 618.

BIOL 619 Environmental Entomology (3)
Prerequisite: Introductory Insect Biology (BIOL 382), or consent of instructor.
Advanced topics in insect systematics, ecology, and applied entomology.

BIOL 620 Insect Biology For Teachers (3)
Prerequisite: Organismic Biology (BIOL 211) and graduate education program participant.
Note: Designed for teachers or those in graduate education programs. Not applicable to graduate or undergraduate programs in Biology.
Arthropod anatomy, physiology, classification, and ecology; emphasis on projects and presentations for middle and high school students. Field and laboratory techniques; projects.

BIOL 621 Molecular Biological Approaches to Environmental Research (4)
Prerequisite: Genetics and Molecular Biology (BIOL 330) and microbiology or bacteriology.
Survey of basic techniques for the study of DNA, RNA, and protein. Provides students with hands-on training in exploring environmental research questions using molecular biological methods. Requires a three-week lab rotation.

BIOL 622 Advanced Aquatic Ecology (5)
Prerequisites: Introduction to Ecology (BIOL 301).
Ecological processes in aquatic environments with primary emphasis on lakes and reservoirs. Lectures concurrent with Biology 522; more advanced material through requirement of independent study or research project. Credit may not be earned in both 522 and 622. 2 hrs. lect., 4 hrs. lab or field.

BIOL 623 Advanced Plant Physiology (5)
Prerequisite: Organismic Biology (BIOL 211) and Cellular Biology (BIOL 311).
Selected topics in plant physiology, with emphasis on growth and reproduction. Lectures concurrent with Biology 523; more advanced material through requirement of independent study or research project. Credit may not be earned in both 523 and 623. 2 hrs. lect., 4 hrs. lab.

BIOL 625 Advanced Aquatic Botany (5)
Prerequisite: Classification & Distribution of Plants (BIOL 300), Plant Morphology (BIOL 325), or consent of instructor.
Identification, classification, and ecology of freshwater algae, aquatic bryophytes, and vascular plants. Lectures concurrent with Biology 525; more advanced material through requirement of independent study or research project. Field work is emphasized. Credit may not be earned in both 525 and 625. 2 hrs. lect., 4 hrs. lab or field.

BIOL 626 Advanced Algal Biology (4)
Prerequisite: Organismic Biology (BIOL 211) and Biology of Populations (BIOL 212) or consent of the instructor.
Identification, classification and ecology of freshwater algae are studied with surveys and experiments in the laboratory and in local lakes and streams. Lectures concurrent with 526. Credit may not be earned in both 526 and 626. 2 hrs. lect., 4 hrs. lab.

BIOL 629 Advanced Mammalogy (4)
Prerequisite: Comparative Vertebrate Anatomy (BIOL 347).
Paleontology, systematics, life history, ecology, and distribution of mammals. Lectures concurrent with Biology 529; more advanced material through requirement of independent study or research project. Credit may not be earned in both 529 and 629. 2 hrs. lect., 2 hrs. lab or field.

BIOL 631 Advanced Cellular Physiology (5)
Prerequisite: Cellular Biology (BIOL 311).
Functional activities of cells and tissues, with emphasis on physical and chemical properties of living matter. Lectures concurrent with Biology 531; more advanced material through requirement of independent study or research project. Credit may not be earned in both 531 and 631. 2 hrs. lect., 4 hrs. lab.

BIOL 632 Advanced Herpetology (4)
Prerequisite: Comparative Vertebrate Anatomy (BIOL 347).
Biology, systematics, and distribution of reptiles and amphibians, with emphasis on Kentucky species. Lectures concurrent with Biology 532; more advanced material through requirement of independent study or research project. Credit may not be earned in both 532 and 632. 2 hrs. lect., 2 hrs. lab or field.

BIOL 633 Advanced Physiological Plant Ecology (5)
Prerequisite: BIOL 523 and 563.
A study of chemical, physical, and biological processes involved in plant ecology. Lectures concurrent with Biology 533; more advanced material through requirement of independent study or research project. Credit may not be earned in both 533 and 633. 2 hrs. lect., 4 hrs. lab.

BIOL 639 Advanced Medical Entomology (4)
Prerequisite: Introductory Insect Biology (BIOL 382) or consent of instructor.
Study of insects and other arthropods causing pathological conditions in man and domestic animals. Lectures concurrent with Biology 539; more advanced material through requirement of independent study or research project. Credit may not be earned in both 539 and 639. 2 hrs. lect., 2 hrs. lab.

BIOL 640 Advanced Intermediary Metabolism (4)
Prerequisite: Organismic Biology (BIOL 211) and Cellular Biology (BIOL 311).
An advanced study of methods and metabolic pathways utilized by various organisms under different environmental conditions. Lectures concurrent with Biology 540; more advanced material through requirement of independent study or research project. Credit may not be earned in both 540 and 640. 3 hrs. lect.

BIOL 641 Advanced Eukaryotic Genetics (4)
Prerequisite: Consent of instructor.
Note: Cross-listed with BIOC 641.
Familiarizes advanced students with classical, molecular and quantitative genetics. Subjects covered include gene mapping in model systems and humans as well as genetic manipulation of model organisms.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

BIOL 642 Advanced Gene Structure and Function (4)
Prerequisite: Genetic & Molecular Biology (BIOL 312).
Advanced topics in genetics of prokaryotes and eukaryotes, including chromosome structure and function, and gene regulation. Lectures concurrent with 542; more advanced material through requirement of independent study or research project. 3 hrs. lect. Credit may not be earned in both 542 and 642.

BIOL 643 Advanced Cytogenetics (4)
Prerequisite: Cellular Biology (BIOL 311) and Genetic & Molecular Biology (BIOL 312).
Heredity as related to cytogenetical phenomena; chromosomal variation as a mechanism of evolution and speciation. Lectures concurrent with Biology 543; advanced material through requirement of independent study or research project. Credit may not be earned in both 543 and 643. 2 hrs. lect.

BIOL 644 Advanced Fisheries Management (5)
Prerequisite: Biology of Populations (BIOL 212).
Principles and techniques of managing freshwater and marine fish stocks for human benefit. Lectures concurrent with Biology 544; more advanced material through requirement of independent study or research project. Credit may be earned in both 544 and 644. 2 hrs . lect., 4 hrs. lab or field.

BIOL 650 Advanced Biostatistics (4)
Prerequisite: Elements of Calculus (MATH 108) or Analytic Geometry & Calculus I (MATH 205); an introductory course in statistics; or consent of instructor.
Application of statistical methods commonly used in life sciences, with emphasis on interpretation of experimental data. Lectures concurrent with Biology 550; more advanced material through requirement of independent study or research project. Credit may not be earned in both 550 and 650. 3 hrs. lect.

BIOL 655 Advanced Microbial Ecology (4)
Prerequisite: Bacteriology (BIOL 355).
Interrelationships between microorganisms and their environments. Lecture concurrent with Biology 555; more advanced material through requirement of independent study or research project. Credit may not be earned in both 555 and 655. 3 hrs. lect.

BIOL 657 Advanced Industrial and Food Microbiology (4)
Prerequisite: Bacteriology (BIOL 355), Introductory Microbiology (BIOL 357), or consent of instructor.
A study of involvement of microorganisms with food and in industrial processes. Lecture concurrent with Biology 557; more advanced material through requirement of independent study or research project. Credit may not be earned in both 557 and 657. 2 hrs. lect., 2 hrs. lab.

BIOL 661 Advanced Principles of Ecology (5)
Prerequisite: Organismic Biology (BIOL 211), and Biology of Populations (BIOL 212).
Principles underlying the relationships between organisms and their environment, with emphasis on techniques of study in the field and laboratory. Credit may not be earned in both 561 and 66l. 2 hrs. lect., 4 hrs. lab. or field.

BIOL 662 Advanced Ecosystems Ecology (4)
Prerequisite: BIOL 561 or consent of instructor.
The transformations of matter and energy that link plant, animal and geochemical cycles. Lectures concurrent with BIOL 562; advanced material or independent research required for students enrolling in 662. Credit may not be earned in both 562 and 662. 3 hrs. lect.

BIOL 663 Advanced Population and Community Ecology (4)
Prerequisite: Introduction to Ecology (BIOL 301)
Introduction to population dynamics and species interactions in aquatic and terrestrial ecosystems. Review of underlying ecological theory and its applications for conserving biodiversity.

BIOL 664 Research Methods in Ecology (3)
Prerequisite: Biology of Populations (BIOL 212).
Introduction to experimental design, data collection and quantitative analyses. Field and laboratory research, statistical tools and critical evaluation data.

BIOL 665 Advanced Sociobiology (4)
Prerequisite: BIOL 561 or consent of instructor.
Study of social systems and their evolution. Emphasis on animal and human behavior. Natural selection, altruism, selfishness, cooperation, parental care and aggression will be included. Lecturers concurrent with BIOL 565; more advanced material through requirement of independent study or research project. Credit may not be received for both 565 and 665.

BIOL 666 Scientific Writing (3)
Graduate level course in scientific writing (publications, grant proposals, conference presentations, job applications) for Biology/Environmental Biology students.

BIOL 667 Advanced Cell Biology (3)
Prerequisite: One quarter of graduate level biochemistry or consent of instructor.
Note: Cross-listed with ASNB 667, BIOC 667 and MBIO 667.
An advanced treatment of cell structure and function including: membranes, organelles, cytoskeleton, cellular communication, and control of cell growth.

BIOL 668 Advanced Conservation Biology (4)
Prerequisite: Genetics and Molecular Biology (BIOL 330), and Introduction to Ecology (BIOL 301).
Theory and practice of conservation. Topics include biodiversity, habitat loss, the effects of habitat changes on populations, and the design and establishment of reserves. Credit may not be earned for both 558 and 668.

BIOL 669 Evolution (3)
Prerequisite: The Diversity of Organisms (BIOL 240), The Diversity of Organisms: Laboratory (BIOL 241), Introduction to Ecology (BIOL 301), and Introduction to Ecology: Laboratory (BIOL 302).
Offers a comprehensive overview of evolution and provides students with a review of issues that make up this critical discipline.

BIOL 671 Special Topics (1-4)
Topics to be indicated in schedule of courses.

BIOL 684 Interdisciplinary Frameworks in Environmental Science and Technology (3)
Overview of environmental problems in human and ecological health and solutions offered by environmental engineering. Presented through lectures, seminars, and a set of practical experiences. Case studies will emphasize interdisciplinary frameworks for solving environmental problems and sustaining use of resources. Credit may not be earned in both 584 and 684.

BIOL 689 Seminar (1)
Reports on personal research and on current literature, with a critique of the research and of the presentation. Attendance but not course registration is required of all graduate biology majors during each semester of residence. Only 2 hours of credit may be accumulated. Graded on pass-fail basis.

BIOL 690 Thesis Research (1-6)
Prerequisite: Consent of major professor.
Research on MS thesis project. Grade shall be deferred by the major professor until evaluation of the thesis by the student's committee. Graded on pass-fail basis by the examining committee.

BIOL 691 Independent Research (1-6)
Prerequisite: Consent of instructor.
Independent field or laboratory research on a problem not related to thesis or dissertation.

BIOL 692 Independent Study (1-6)
Prerequisite: Consent of instructor.
Independent library research on a problem not related to the thesis or dissertation.

BIOL 700 Dissertation Research (1-9)
Prerequisite: Consent of major professor.
Research on dissertation project. Grade shall be deferred by the major professor until evaluation of the dissertation by the student's committee. Graded on a pass-fail basis by the examining committee until evaluation of the dissertation by the student's committee.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Business Education(0523-B ED)

NOTE: *These courses may be taken only by business education majors admitted to the Graduate School.*

B ED 601 Principles and Problems of Business Education (3)
Historical background and present status of business education, critical evaluation of business curricula, guidance activities of the business teacher, and review of current literature and research. (Required).

B ED 603 Improvement of Instruction in Business Education (Business and Economics) (3)
Individual and group projects which deal with objectives, instructional materials, teaching procedures, curricular organization, and teaching problems in such fields as bookkeeping and accounting, business organization and management, business law, consumer economics, economics, and general business.

B ED 620 Directed Readings in Business Education (1-3)
Intensive study of current topics in business education. Opportunity will be available for independent research and writing.

Center for Applied Microcirculatory Research (5213-CAMR)

CAMR 620 Methods in Cellular Fluorescence (3)
Prerequisite: BIOC 602
Examines the use of modern fluorescence techniques to monitor alterations in membrane properties and cellular activation. Theory of fluorescence spectroscopy and imaging, and applications of fluorescence techniques to monitor biochemical and biophysical events within the cell.

Chemical Engineering (5818-CHE)

CHE 502 Biochemical Engineering (3)
Engineering principles related to operations involving biological processes, e.g., fermentation. Basic microbiology and biochemistry; biochemical reaction mechanisms, kinetics, rate processes, and separation techniques. Applications to foods, pharmaceuticals, and waste treatment.

CHE 509 Environmental Processes and Systems (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with CEE 509.
Provides an intensive examination of the scientific and engineering aspects of the environmental problems that face society, directing the student toward recognition of existing technical solutions and the development of new solutions. Presents an engineering approach to analyze natural environmental systems and to develop specific techniques and methods to treat or eliminate existing environmental problems. Students will be required to formulate a design and make a presentation of a technical solution to a specific environmental problem from actual practice.

CHE 530 Physical Metallurgy (3)
Prerequisite: Materials Science (CHE 253), or consent of instructor.
Defects in metals, including grain boundaries, dislocations, and point defects; theories of deformation and fracture recrystallization and grain growth; martinistic and diffusion controlled transformations; alloy hardening; the selection and heat treatment of commercial alloys.

CHE 532 Advanced Material Science (3)
Advanced study of materials science from an atomistic viewpoint. The electronic and atomic structure of materials, properties characterized by electron motion, properties associated with atomic motion, applications and synthesis of fundamentals to several real problems.

CHE 533 Chemical Engineering Safety and Health (3)
Overview of regulations and industrial practices, emphasizing chemical hazards, including: industrial hygiene, toxicology, controls and hazards analysis.

CHE 534 Industrial Waste Management (3)
Note: Cross-listed with CEE 534.
A survey of regulations, generation, control and management of industrial wastes and environmental hazards: airborne, aqueous, solids and hazardous wastes. Course includes guest speakers, site visits and a term project.

CHE 535 Pollution Prevention (3)
Multimedia pollution prevention and waste minimization of hazardous and nonhazardous wastes and emissions: toxics use reduction; source reduction; reuse, reclamation and recycling; product life-cycle analysis; economic evaluation; assessments; planning and management.

CHE 550 Kinetics of Polymer Reactions (3)
Prerequisites: Kinetics & Chemical Reactors (CHE 441), or consent of instructor.
Kinetic expressions for several polymer reaction mechanisms including chain, step, ionic and emulsion reactions; copolymerization; polymer reaction engineering; molecular weight distributions; structural considerations.

CHE 551 Polymer Science (3)
Introduction to polymer engineering. Polymer synthesis, kinetics, structure, and properties; commercial polymers; polymer processing.

CHE 562 Process Control Laboratory (1)
Prerequisite or corequisite: Elements of Process Control (CHE 461).
A laboratory course demonstrating the characteristics of sensing and control devices and their interactions when incorporated into process control systems.

CHE 572 Plant Process and Project Design (3)
Prerequisite: The Strategy of Design (CHE 471).
A study in the merging of chemical process design of a chemical plant, complete with plant location, plot plan, equipment specifications, and estimations of plant costs and profitability.

CHE 574 Techniques of Research (3)
The design, analysis, and interpretation of experimental results to obtain the desired information within reasonable constraints of time and expense. Testing predictions and making reliable decisions utilizing graphical, numerical, and statistical techniques.

CHE 610 Advanced Thermodynamics (3)
A comprehensive study of physical and chemical equilibrium, with special emphasis on nonideality.

CHE 612 Nonequilibrium Thermodynamics (3)
The extension of classical thermodynamics to include systems in which transport processes are taking place. Examples from the areas of engineering, chemistry, and biological systems are examined.

CHE 620 Transport Phenomena I (3)
Prerequisite or corequisite: CHE 686.
An integrated study of momentum, thermal energy, and mass transport by molecular and convective mechanisms, with and without gene ration, for steady-state and unsteady-state conditions, in laminar, boundary-layer, or turbulent flow. Molecular theories or transport properties.

CHE 621 Transport Phenomena II (3)
Prerequisite: CHE 620.
Consideration of advanced theories and applications of transport properties as related to heat, mass, and momentum transfer.

CHE 624 Introduction to Rheology (3)
Principles and applications of the rheology materials. Kinematics of shear and elongational flows. Properties of polymer melts; experimental rheometry. Property predictions based on a variety of generalized Newtonian, linear viscoelastic, cordtational, and code formational models.

CHE 631 Homogeneous Fluid Dynamics (3)
Advanced study of momentum transfer in homogeneous fluids. Conservation of matter, momentum, and mechanical energy; ideal flow, creeping flow, laminar flow, turbulent flow, and boundary layer theory; non-Newtonian fluids.

CHE 632 Heterogeneous Flow (3)
Analysis of two-phase flows of gases, liquids, and solids. Single-particle and multiparticle systems, fluidized beds, bubble beds, drop beds; slug flow, annular flow.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

CHE 633 Heat Transfer (3)
Advanced problems in the field of heat transfer.

CHE 637 Advanced Stagewise Processes (3)
Methods of calculations for complex binary and multicomponent mixtures. Consideration is also given to the design of equipment for these separations.

CHE 638 Advanced Absorption (3)
An examination of absorption as a portion of general mass transfer phenomena. Theoretical and generalized relationships are applied to industrial problems of design.

CHE 640 Chemical Kinetics and Catalysis (3)
Catalytic reaction mechanisms and solid catalysts: cracking, reforming, hydrotreatment of fuels, synthesis gas conversion and partial oxidation reactions, etc.

CHE 641 Advanced Reactor Design (3)
Reactor design and performance with emphasis on non-ideal behavior. Includes study of non-isothermal, non-ideal flow homogeneous and heterogeneous reactors. Introduction to heterogeneous catalysis and biochemical reactors.

CHE 650 Membrane Separations (3)
Prerequisite: Consent of instructor.
Qualitative and quantitative description of membrane separation processes including reverse osmosis and ultrafiltration; membrane synthesis; industrial applications including wastewater treatment, continuous systems, liquid membranes and gas separations.

CHE 653 Polymer Processing (3)
Introduction to polymer melt rheology. Simple model flows. Analysis, modeling, and control of polymer melt processes such as extrusion, calendering, fiber spinning, film blowing, injection molding, and blow molding.

CHE 654 Engineering Properties of Polymers (3)
The relationships between molecular structure, measurable properties, and design requirements for polymeric materials. Molecular topology; morphology; rheology; mechanical, thermal, electrical, optical, and chemical properties; design and economic considerations in engineering applications.

CHE 660 Optimization in Control Systems (3)
Theory of optimization will be studied and applied to the solution of control problems. Both steady-state and dynamic optimization topics will be considered.

CHE 661 Control of Dynamic Processes (3)
A combined laboratory and seminar course involving advanced process-control experiments and simulation procedures.

CHE 662 Advanced Process Control (3)
Advanced control-system design; feed-forward, cascade, adaptive, multivariable, and constant systems; and computer process control.

CHE 663 Distillation Dynamics and Control (3)
Multicomponent calculations and design of distillation units. Automatic control of these units, sensitivity analysis in control strategy, and dynamic mathematical modelling and simulation of the columns and accessories.

CHE 664 Sampled-Data Control Systems (3)
Analysis and synthesis of closed-loop sample-data control systems using Z-transform calculus and state space methods. Digital controllers, multirate sampling, quantization, and other advanced control topics. (Same as EE 661 offered by and in conjunction with the Department of Electrical Engineering).

CHE 686 Chemical Engineering Analysis (3)
Mathematical modelling of chemical engineering phenomena leading to total and partial differential equations requiring solution by use of series, transforms, and numerical techniques.

CHE 687 Modeling and Simulation of Chemical Processes (3)
Prerequisite or corequisite: CHE 686.
Techniques of computer-aided process modeling and design, primarily using process stimulators such as DYFL02 and ASPEN PLUS. DYFL02 simulates the dynamic and steady state behavior of process operations such as distillation columns, heat exchangers and reactors. ASPEN PLUS is an advanced sequential modular process simulator and economic evaluation system. Other stimulators may be introduced.

CHE 690 M.S. Thesis in Chemical Engineering (1-6)
Experimental and/or theoretical research to be presented in thesis for degree requirement.

CHE 693 Advanced Research in Chemical Engineering (1-12)

CHE 694 Special Topics in Chemical Engineering (1-6)

CHE 695 Chemical Engineering Seminar (1-4)

CHE 696 Independent Study in Chemical Engineering (1-6)

Chemistry (0316-CHEM)

CHEM 515 Inorganic Chemistry (3)
Prerequisite: One year of physical chemistry.
Descriptive and theoretical chemistry of the elements. 3 hrs. lect. (Credit may not be applied toward an advanced degree in chemistry.)

CHEM 516 Inorganic Chemistry Laboratory (1)
Corequisite: CHEM 515.
Physical methods in inorganic chemistry; the preparation and characterization of inorganic compounds. 4 hrs. lab. (Credit may not be applied toward an advanced degree in chemistry.)

CHEM 525 Instrumental Analysis (2)
Prerequisite: One semester of quantitative analysis and two semesters of physical chemistry.
An introduction to modern instrumental approaches to analysis emphasizing spectrophotometry in all regions, potentiometry and voltammetry, and gas and liquid chromatography. 2 hrs. lect. (Credit may not be applied toward an advanced degree in chemistry.)

CHEM 526 Instrumental Analysis Laboratory (2)
Corequisite: CHEM 525
Laboratory experience with the methods of analysis considered in Chem 525. 8 hrs. lab. (Credit may not be applied toward an advanced degree in chemistry.)

CHEM 543 Modern Organic Analysis (2)
Prerequisite: One semester of quantitative analysis and two semesters of organic chemistry (including laboratory).
Identification of organic unknowns through systematic study of their chemical and physical properties, with emphasis on the analysis and interpretation of their IR mass and NMR spectroscopic properties. 2 hrs. lect. (Credit may not be applied toward an advanced degree in chemistry.)

CHEM 544 Modern Organic Analysis Laboratory (2)
Corequisite: CHEM 543
Laboratory experience with spectral methods of organic analysis presented in CHEM 543. 8 hrs. lab. (Credit may not be applied toward an advanced degree in chemistry.)

CHEM 545 Biochemistry I (3)
Prerequisite: Organic Chemistry II (CHEM 342).
Note: Cross-listed with BIOC 545.
Chemistry of amino acids, peptides, proteins, nucleotides and nucleic acids; methods of analysis and laboratory synthesis; enzyme properties, kinetics, and control mechanisms; ligand binding. Credit may not be earned in both 545 and 645. Credit may not be applied toward an advanced degree in chemistry.

CHEM 546 Biochemistry Laboratory (1)
Corequisite: CHEM 545.
Laboratory experience in basic biochemistry covered in Chem 545. 3 hrs. lab. (Credit may not be applied toward an advanced degree in chemistry.)

CHEM 547 Biochemistry II (3)
Prerequisite: CHEM 545/BIOC 545
Note: Cross-listed with BIOC 547.
Cellular metabolism of carbohydrates, lipids, amino acids and nucleotides; RNA, DNA and protein biosynthesis; biomembrane phenomena. Credit may not be earned in both 547 and 647. Credit may not be applied to an advanced degree in chemistry.

CHEM 550 Group Theory and its Chemical Applications (3)
Prerequisite: One year of physical chemistry.
Elementary group theory; the use of group theory to treat symmetry; application to atomic structure, molecular structure, spectroscopy, and reaction mechanisms. 3 hrs. lect.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

CHEM 557 Bio-Organic Phenomena (3)
Prerequisite: One year of organic chemistry.
Special topics in the biological chemistry area: e.g., chemical carcinogenesis; diet and cancer, food chemistry and polypeptides; proteins; carbohydrates; enzymes; hormone chemistry. 3 hrs. lect.

CHEM 561-562 Advanced Physical Chemistry (3-3)
Prerequisite: One year of physical chemistry, one semester of atomic and molecular physics.
First semester (561): introduction to quantum chemistry. Second semester (562): theoretical and experimental approaches to molecular structure. 3 hrs. lect.

CHEM 576 Polymer Chemistry (3)
Prerequisite: One year each of organic chemistry and physical chemistry.
The physical and organic chemistry of high molecular weight polymers. 3 hrs. lect.

CHEM 591-592 Chemistry for Teachers I, II (3-3)
Prerequisite: For graduate education majors. Must have experience in teaching chemistry principles in elementary, middle, or secondary schools.
Teaching pre-college chemistry with emphasis on curriculum content, laboratory procedures, and process skills.
Summer.

CHEM 620 Optical Spectrochemical Methods of Analysis (3)
Prerequisite: CHEM 525 and 526.
Principles, instrumentation, and applications of atomic and molecular spectroscopic techniques used in the IR, VIS, and UV spectral regions.

CHEM 621 Electroanalytical Chemistry (3)
Prerequisite: CHEM 525 and 526.
Principles of modern voltammetric and potentiometric methods of chemical analysis including fundamental theory, instrumentation, and applications.

CHEM 622 Analytical Separations (3)
Prerequisite: CHEM 525 and 526.
Survey of major instrumental separation methods in chemistry and biochemistry with an emphasis on modern chromatographic techniques.

CHEM 623 Advanced Chemical Instrumentation (3)
Prerequisite: CHEM 525 and 526.
Electronic aspects of chemical instrumentation; analog and digital circuitry; computer interfacing and software.

CHEM 625 Advanced Analytical Chemistry (3)
Prerequisite: CHEM 525 and 526.
A survey of theoretical and practical aspects of modern methods of analysis.

CHEM 629 Special Topics in Analytical Chemistry (1-3)
Prerequisite: CHEM 525 and 526, or consent of instructor.
Recent developments in selected areas of analytical chemistry.

CHEM 632 Chemical Education (3)
Prerequisite: BA or BS in Chemistry, or consent of instructor
Overview of the field of chemical education. Topics include learning and teaching methods, assessment, chemical demonstrations, laboratory instruction, computer-based instruction, and curricular design.

CHEM 645 Advanced Biochemistry I (4)
Prerequisite: Organic Chemistry (CHEM 342).
Note: Cross-listed with BIOC 645.
Chemistry of amino acids, peptides, proteins, nucleotides and nucleic acids; methods of analysis and laboratory synthesis; enzyme properties, reaction kinetics, reaction control and mechanisms; ligand binding. Lectures concurrent with CHEM 545; additional lecture hour each week covers related advanced topics. Credit may not be earned in both 545 and 645.

CHEM 647 Advanced Biochemistry II (4)
Note: Cross-listed with BIOC 647.
Cellular metabolism of carbohydrates, lipids, amino acids and nucleotides; RNA, DNA and protein biosynthesis; biomembrane phenomena. Lectures concurrent with CHEM 547; additional lecture hour each week covers related advanced topics. Credit may not be earned in both 547 and 647.

CHEM 651-652 Independent Study (1-3)
Credit according to achievement; limited to 3 hrs. per semester

CHEM 653 Main Group Chemistry (3)
Prerequisite: CHEM 515.
Survey of the descriptive chemistry of the main group elements and topics of current interest in main group chemistry such as bonding theories, reaction mechanisms, electronic materials, and catalytic materials.

CHEM 654 Advanced Coordination Chemistry (3)
Prerequisite: CHEM 515.
Survey of structure, bonding, and reactivity of the transition metal complexes. Covers topics such as organometallic and bioinorganic chemistry, group theory, and magnetism.

CHEM 655-656 Special Topics in Inorganic Chemistry (1-3)
Prerequisite: CHEM 515.
Current problems in inorganic chemistry. 3 hrs. lect.

CHEM 661 Chemical Thermodynamics (3)
Prerequisite: One year of physical chemistry.
Advanced discussion of the principles of thermodynamics including an introduction to statistical thermodynamics; applications to chemical systems. 3 hrs. lect.

CHEM 665-666 Special Topics in Physical Chemistry (1-3)

CHEM 667 Reaction Kinetics (3)
Prerequisite: One year of physical chemistry.
Theory of the rate of chemical reactions; methods of studying reaction rates; reaction energetics; reactions in solution; chain reactions and inference of mechanism from rate studies. 3 hrs. lect.

CHEM 668 Electrochemistry (3)
Prerequisite: Consent of instructor.
A thermodynamic and kinetic study of electrochemical phenomena, including electrical conductivity, electrophoresis, electrode potentials, and electrode processes. 3 hrs. lect.

CHEM 670 Chemistry of Heterocyclic Compounds and Alkaloids (3)
Prerequisite: One year each of organic and physical chemistry.
Structures, reactivities, activities, and synthesis of heterocyclic systems including natural products and their uses in medicine. 3 hrs. lect.

CHEM 671 Advanced Polymer Chemistry (3)
Prerequisite: One year each of organic and physical chemistry.
Polymer characterization, physical properties and structure. Conformational changes, elasticity, relaxation phenomena, size and chain distributions; application of microscopy, spectroscopy, magnetic resonance, and diffraction to polymers; liquid crystals. 3 hrs . lect.

CHEM 672 Quantum Chemistry (3)
Prerequisite: CHEM 561
Principles of quantum theory with applications to chemistry; and advanced treatment of atomic and molecular structure including Slater-Condon methods for atoms and LCAO-MO-SCF methods for molecules; introduction to ab initio methods. 3 hrs. lect.

CHEM 675-676 Special Topics in Organic Chemistry (1-3)
Prerequisite: One year of organic chemistry.
Current problems in organic chemistry; organometallic chemistry; free radical reactions; carbohydrates and nucleosides; peptides. 3 hrs. lect.

CHEM 678-679 Advanced Organic Chemistry: General Survey (3-3)
Prerequisite: One year each of organic and physical chemistry.
First semester (678): an introduction to advanced physical organic chemistry, linear free energy relationship, kinetics, isotope effects and spectroscopic techniques as used in the interpretation of reaction mechanisms.
Second semester (679): an introduction to advanced organic chemistry emphasizing reactions and synthesis, and including spectral applications. 3 hrs. lect.

CHEM 681 Modern Biochemistry I (3)
Prerequisite: One year each of organic and physical chemistry or consent of instructor. Chemistry and physical properties of proteins, other biopolymers; enzymatic reaction mechanisms and kinetics; bioenergetics.

CHEM 682 Modern Biochemistry II (3)
Prerequisite: CHEM 681 or consent of instructor.
Carbohydrate, lipid, protein, and nucleic acid metabolism; endocrine control of metabolism and physiological activities.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

CHEM 683 Statistical Thermodynamics (3)
Prerequisite: CHEM 561.
Principles of statistical thermodynamics and applications applied to the molecular interpretation of the physical-chemical processes of gases, liquids, and solids. 3 hrs. lect.

CHEM 686 Magnetic Resonance (3)
Prerequisite: CHEM 561.
Principles of magnetic resonance with classical and quantum mechanical descriptions of the phenomena. Quantum chemical interpretations of NMR and EPR parameters, including a study of chemical shifts, spin-spin splittings, hyperfine splittings, zero-field splittings, and Knight shifts. 3 hrs. lect.

CHEM 687 Molecular Spectroscopy (3)
Prerequisite: CHEM 561.
Molecular structure and interactions as determined by spectroscopic investigation. Rotational, vibrational and electronic spectroscopy as determined by ultraviolet, visible, infrared, microwave and radio frequency methods. Fundamental theory and experimental methods. 3 hrs. lect.

CHEM 688 X-Ray Crystallography and Its Application to Molecular Structure (3)
Prerequisite: CHEM 561.
Crystal structure analysis. Topics include: symmetry, space groups, data collection, structure solution and refinement, structural analysis and presentation of scientific results. 2 hrs. lect., 1 hr. lab.

CHEM 691-692 Research (1-15)
Prerequisite: 30 semester hours of undergraduate chemistry.

CHEM 695 Seminar (1)
Maximum credit allowed is 3 semester hours. Required of all graduate students during residency.

Civil and Environmental Engineering (5826-CE)

CEE 509 Environmental Processes and Systems (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with CHE 509
Provides an intensive examination of the scientific and engineering aspects of the environmental problems that face society, stressing all important issues, and directing the student toward recognition of existing technical solutions and the development of new solutions. Covers the basic scientific and engineering principles required to understand natural and designed systems, and presents an engineering approach to analyze natural environmental systems and to develop specific techniques and methods to treat or eliminate existing environmental problems. Students will be required to formulate a design and make a presentation of a technical solution to a specific environmental problem from actual practice.

CEE 520 Advanced Design of Structural Systems (3)
Prerequisite: Fundamentals of Concrete Design (CE 421) and Fundamentals of Steel Design (CE 422).
Economical use of engineering material in the design of civil engineering structures. Consideration of design constraints due to fabrication, shipping and erection limitations. Emphasis on computer-aided design techniques.

CEE 522 Fundamentals of Prestressed Concrete (3)
Prerequisite: Matrix Structural Analysis (CE 420) and Fundamentals of Concrete Design (CE 421).
Introduction to pre-tensioned and post-tensioned prestressed concrete. Design of precast concrete slabs, buildings, and bridges in accordance with ACI specifications and the Prestressed Concrete Institute (PCI) recommended practices. Application of computer programs for member analysis and design.

CEE 532 Experimental Stress Analysis (3)
Prerequisite: Construction Materials (CE 530).
Fundamentals of experimental stress analysis, brittle coating, photoelastic coating, and electrical strain gage techniques, strain measurements under static and dynamic loading.

CEE 534 Industrial Waste Management (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with CHE 534.
A survey of generation, control and management of industrial waste and environmental hazards: airborne, aqueous, solid and hazardous wastes.

CEE 535 Solid Waste Management (3)
Prerequisites: Consent of instructor.
Definition of solid wastes; generation rates; recycling and reuse; collection and processing; materials recovery; composting; incineration; energy recovery; landfilling (siting, design, operation, closure); planning and management.

CEE 550 Measurement of Soil Properties (4)
Prerequisite: Geomechanics (CE 450).
Laboratory testing of soil mechanical properties; index testing; testing for permeability, compressibility, and shear strength.

CEE 551 Foundation Engineering (3)
Prerequisite: Geomechanics (CE 450).
Character of natural soil deposits. Subsurface exploration and testing. Foundation types, limitations. Bearing capacity and settlement analyses. Design of foundations.

CEE 552 Earth Pressures and Retaining Structures (3)
Prerequisite: Geomechanics (CE 450).
Earth pressure calculation: theory and practice. Design techniques for retaining walls, reinforced earth and soil nailing.

CEE 560 Traffic Engineering (3)
Prerequisite: Transportation Systems Engineering (CE 360).
Characteristics of the vehicle, the driver, and the traffic stream. Highway and intersection capacity, theory of traffic flow, parking, traffic safety.

CEE 571 Applied Hydrology (3)
Prerequisite: CE 470.
Introduction to hydrologic systems; modeling runoff from watersheds using lumped and distributed methods; stormwater management and design; hydrologic and hydraulic routing including kinematic wave routing; computer rainfall-runoff simulation models. A hydrologic design project will be assigned to all students; special assignments dealing with hydrologic processes will be assigned to M.S. students.

CEE 573 Groundwater Hydrology (3)
Prerequisite: Geomechanics (CE 450) and Surface Water Hydrology (CE 470).
Fundamental concepts of fluid flow and soil properties; theory of groundwater movement; mechanics of well flow; groundwater contaminant transport.

CEE 590 Current Topics in Civil Engineering (1-4)
Prerequisite: Consent of instructor.

CEE 604 Interaction of Soils and Structure (3)
Prerequisite: Fundamentals of Concrete Design (CE 421), Fundamentals of Steel Design (CE 422), and Foundation Engineering (CE 551).
Response of foundation materials to applied static and dynamic loads. Foundation design procedures based upon consideration of soil-structure interaction.

CEE 620 Advanced Mechanics of Solids (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with ME 620.
Analysis of stress and strain. Topics include theories of failure, unsymmetric bending, curved beams, shear center, torsion, beams on elastic foundations, beams with combined axial and lateral loads, thick-wall cylinders, rotating disc, introduction to elastic stability.

CEE 621 Finite Element Analysis for Structural Engineers (3)
Prerequisite: Matrix Structural Analysis (CE 420).
Introduction to the finite element method (FEM) and its application to structural engineering. Topics include displacement and variational base one-, two-, and three-dimensional element formulation, introductory elasticity, isoparametric elements, interpolation methods, numeric integration, geometric and material nonlinearity. Emphasis on FEM program development.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

CEE 622 Theory of Plates and Shells (3)
Prerequisite: CE 620.
Plate bending theory, circular and rectangular plates. Membrane stresses and bending stresses in shells. Numerical solutions and computer applications.

CEE 623 Advanced Structural Engineering (3)
Prerequisite: CE 621.
Selected topics among: complex buildings (unsymmetrics, shear walls, etc.), bridges, earthquake engineering, wind engineering, random vibrations.

CEE 624 Nonlinear Material Behavior (3)
Prerequisite: Construction Materials (CE 530).
In-depth presentation of the time- and temperature-dependent mechanical properties of various engineering materials, such as plastics, rubbers, bituminous mixes.

CEE 625 Structural Dynamics (3)
Prerequisite: Matrix Structural Analysis (CE 321).
Dynamic analysis of structural systems including dynamic response by modal superposition, step integration, response spectrum frequency analysis. Computer applications.

CEE 652 Advanced Earth Pressure and Retaining Structures (3)
Prerequisite: Earth Pressures and Retaining Structures (CE 552)
Soil pressure-structure movement interactions. Design of anchored bulkheads. Retained excavation analysis. Design of cellular cofferdams. Introduction to culverts/tunnels.

CEE 653 Design of Earth Structures (3)
Prerequisite: Geomechanics (CE 450).
Seepage and internal erosion. Stability analyses. Failure mechanisms in natural slopes. Design of earth dams. Embankment construction, control and instrumentation.

CEE 654 Rock Mechanics (3)
Prerequisite: Geomechanics (CE 450).
Physical properties of intact rock; mechanical properties of rock masses, emphasis on practical applications. Rock blasting. Tunneling.

CEE 660 Transportation Planning and Urban Development (3)
Prerequisite: Transportation Systems Engineering (CE 360).
Note: Cross-listed with UPA 688.
Principles of transportation planning in the urban environment, including land use planning, with emphasis on the orderly development of the transportation system.

CEE 661 Environmental Analysis of Transportation Systems II (3)
Prerequisite: Environmental Analysis of Transportation Systems I (CE 561).
A continuation of CE 561, with in-depth advanced study of air quality and noise levels resulting from transportation improvements. CE 561 is not available for credit toward Graduate School degrees.

CEE 662 Airport Planning & Design (3)
Prerequisite: Transportation Systems Engineering (CE 360).
The principles of location, planning, design, and evaluation of airports are examined from the engineering perspective. In addition, laws and regulations concerning airports and the aviation system are thoroughly studied.

CEE 663 Advanced Traffic Operations (3)
Prerequisite: CE 560.
A continuation of CE 560, with an emphasis on mathematical and computer techniques to solve traffic problems.

CEE 665 Pavement Design (3)
Prerequisite: Transportation Systems Engineering (360) and Geomechanics (CE 450).
Design of flexible and rigid pavements, base courses, and subgrades. Effects of loading on pavement life.

CEE 670 Advanced Hydraulics (3)
Prerequisite: Engineering Hydraulics (CE 370).
Dimensional analysis; integral form of the equations of motion; shear stress distribution; turbulence and boundary layer theory; concepts in particle drag and settling.

CEE 671 Stochastic Processes in Hydrology (3)
Note: Cross-listed with UPA 692.
Basic concepts and classification of stochastic processes with emphasis on hydrologic systems; analysis of hydrologic time series; models for stationary hydrologic stochastic processes.

CEE 672 Statistical Methods in Water Resources (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360).
Applications of advanced concepts of probability and statistics in hydrology and water resources including frequency analysis and regionalization; parameter estimation; analysis of variance and multiple regression techniques.

CEE 673 Advanced Hydrology (3)
Prerequisite: Groundwater Hydrology (CE 573) and Probability & Statistics for Engineers (EMCS 360).
Advanced concepts for studying hydrologic processes; theory of linear hydrologic systems; conceptual models for modelling watershed rainfall-runoff response including geomorphological approaches.

CEE 674 Water Resources Systems (3)
Application of systems analysis techniques in the planning and design of water resources projects; mathematical optimization; simulation and risk-based decision-making.

CEE 675 Surface Water Quality Modeling (3)
Prerequisite: Consent of instructor.
Modeling, design and control of water quality in river, lake, and estuary systems; dissolved oxygen and toxic substance models; and lake eutrophication.

CEE 676 Sediment Transport and River Mechanics (3)
Prerequisite: Engineering Hydraulics (CE 370).
Sediment transport theory; overland erosion; alluvial streams; analysis, prediction, and control of river characteristics; local scour at river structures.

CEE 677 Groundwater Modeling (3)
Prerequisite: Engineering Hydraulics (CE 370) and CE 573.
Mathematical and numerical modeling of groundwater and pollution transport.

CEE 690 M.S. Thesis in Civil Engineering (1-6)
Experimental and/or theoretical research to be presented in thesis for degree requirement.

CEE 693 Independent Study in Civil Engineering (1-6)

CEE 694 Special Topics in Civil Engineering (1-6)

CEE 695 Civil Engineering Seminar (1)

Commercial Law (0541-CLAW)

CLAW 600 Legal Aspects of Business (3)
Public policy toward business as expressed in the law. Government regulation of securities, trade, employment, environment, and organization: a broad review.

CLAW 610 Commercial Law for Professional Accountants (3)
Prerequisite: Admittance to the Master of Accountancy program
Covers the legal environment of the professional accountant, including business organizations, government regulations and legal liability.

CLAW 680 Special Topics in Business and Law (3)
A focused study of selected issues in the regulation of business. Content varies at the discretion of the instructor.

Communication (0319-COMM)

COMM 520 Computer-Mediated Communication (3)
Prerequisite: Computer Communication (COMM 150) or consent of instructor
Conceptual analysis and practical use of computer networks with an emphasis on the social and cultural dimensions of this type of human communication.

COMM 590 Health Communication (3)
Prerequisite: Consent of instructor
Studies the nature, function, and importance of communication in the delivery of health care and/or medical knowledge.

COMM 600 Practicum (1-3)
Prerequisite: Consent of instructor
Practical work in speech. Pass/Fail grading

COMM 610 Problems of Public Discourse (3)
Prerequisite: Consent of instructor
Surveys the chief theories and disputes about public discourse, public knowledge, and decision-making.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

COMM 620 Organizational Communication (3)
Prerequisite: Consent of instructor
Theoretical and applied studies of communication within organizations and between organizations and their publics.

COMM 630 Communication and Multiculturalism (3)
Prerequisite: Consent of instructor
Explores the influence of race, nationality, and/or gender on the communication practices of individuals and their institutions.

COMM 640 Communication in Social Service (3)
Prerequisite: Consent of instructor.
Studies public communication campaigns, e.g., health information and policy campaigns.

COMM 650 Corporate Communication (3)
Prerequisite: Admission to M.B.A. program
Study of the nature, strengths, and weaknesses of empirical research in organizational communication and application of these findings to analysis, diagnosis, and remedy or communication problems in specific organizations. Focus is primarily on case studies and in-community "practicum" consulting project.

COMM 651 Conflict Management (3)
Uses role playing and case studies in community organizations to assist students in developing the skills needed for managing conflict.

COMM 652 Computer-Mediated Communication in Organizations (3)
Hands-on study and use of developing technologies and examination of the integration and consequences of innovations in computer communication in organizations.

COMM 653 Integrated Marketing Communication Campaigns (3)
Study of integrated advertising, public relations, and sales promotions. Course culminates with students preparing integrated marketing plans for local clients.

COMM 654 Public Relations and Crisis Management (3)
Examines problems of planning and implementing public relations strategies for crisis management. The organizations studied include corporations, agencies, educational and government institutions, and non-profits.

COMM 690 Special Topics (3)
Examination of topics not covered in regularly-scheduled courses.

Communicative Disorders (5215-CMDS)

CMDS 545 Survey of Communication Processes and Disorders (3)
General overview of audiology and speech-language pathology, including incidence of communicative disorders, anatomy and physiology, diagnostic and rehabilitative audiometry, normal speech and language development and disorders, and neurogenic disorders.

CMDS 557 Aural Rehabilitation (4)
Prerequisite: CMDS 545.
Overview of historical and current philosophies in the rehabilitation of hearing impaired persons, including psychological, sociological, educational and vocational aspects.

CMDS 563 Clinical Phonetics (3)
The International Phonetic Alphabet and other symbol systems are utilized in transcription of speech sounds. A description of speech sounds in terms of acoustics and physiologic dimensions. Special emphasis on speech disorders and dialects.

CMDS 564 Preschool Language Intervention (3)
Principles of language intervention, including phonology, for infants, toddlers and preschoolers. Emphasis placed on typical development as well as disordered populations.

CMDS 567 Fundamentals of Speech and Hearing Science (3)
Topics include acoustics, speech-sound acoustics & speech production characteristics, co-articulation, biophysics & psychoacoustics of hearing, and instrumentation in the speech and hearing sciences.

CMDS 570 Clinical Observation in Speech Pathology and Audiology (1)
Observations in speech pathology and audiology. Additional observations may be assigned to introduce students to the variety of practicum opportunities available in the program. Pass/fail grading.

CMDS 572 Anatomy and Physiology of the Auditory Vestibular System (4)
Prerequisite: CMDS 545 and elective in human biology, or consent of instructor.
Note: Cross-listed with AUDI 600.
Structure and function of speech, auditory/vestibular mechanisms. Includes neuroanatomy and neurophysiology of communication. Emphasis on clinical applications. Dissection of human cadaver material.

CMDS 574 Introduction to Research in Communication Disorders (3)
An overview of the research arena as applied to communication disorders. Techniques and applications of literature review, research design, statistical methods, and effective writing will be covered.

CMDS 602 Articulation/Phonology (3)
Prerequisite: CMDS 563 and 567.
Study of vowel and consonant characteristics; sequence of development of phonology/articulation. Procedures for diagnosing disorders in phonology /articulation are examined.

CMDS 604 Audiology I (4)
Prerequisite: CMDS 545 or an undergraduate audiology course.
Overview of hearing loss, introduction to methods of assessment, principles of masking, case history, basic pathology, and screening.

CMDS 610 Practicum in Audiology (1-4)
Prerequisite: CMDS 567 and 604.
Clinical training in the areas of conventional audiometry, advanced diagnostics, patient management, hearing aid selection and aural rehabilitation therapy. Advanced students will be assigned to a variety of clinical settings with the consent of the instructor .

CMDS 611 Practicum in Speech Pathology (1-4)
Prerequisite: CMDS 564 and 602.
Diagnostic and therapeutic contact with individuals who exhibit communication disorders. Practicum obligations include treatment planning, report writing and patient/parent counseling. Advanced students will be assigned to outside practicum sites with the consent of the instructor.

CMDS 618 Counseling and Interviewing (2)
Techniques for counseling patients and families; strategies for completing a variety of interview strategies and the reporting of interview results.

CMDS 620 Neurological Disorders of Speech Production (3)
Prerequisite: CMDS 572.
Study of disorders resulting in flaccid, spastic, mixed, ataxic, hypokinetic, or hyperkinetic dysarthria. Covers diagnostic and treatment strategies.

CMDS 630 Amplification Systems in Aural Rehabilitation (3)
Prerequisite: CMDS 567, 572 and 604.
Principles and amplification for the hearing impaired. Psycho-acoustics and electroacoustics of hearing aid selection, evaluation and rehabilitation. Hearing aid selection and fitting strategies, assistive listening devices and systems.

CMDS 651 Audiology II (4)
Prerequisite: CMDS 572 and 604.
Study of diagnostic techniques in the differential diagnosis of etiologies and pathologies related to hearing loss in both children and adults.

CMDS 652 School Age Language and Phonology Intervention (3)
Prerequisite: CMDS 564.
Principles of intervention for school-age children and adolescents with language disorders. Considers phonological and pragmatic aspects of language along with semantics, morphology and syntax.

CMDS 653 Hearing Conservation (2)
Prerequisite: CMDS 604.
Methods of detection, prevention and monitoring of hearing in special populations, particularly those exposed in the industrial work place. Topics include federal regulations and the effect of noise on humans.

CMDS 654 Evoked Potentials in Audiology (2)
Prerequisite: CMDS 651.
Principles of electrophysiology as applied to assessment of the auditory system. Includes brainstem auditory evoked potentials, electrocochleography, middle latency potentials, long latency potentials, hearing assessment, retro-cochlear evaluation and intro-operative monitoring.

CMDS 658 Advanced Concepts in Audiology (1-3)
Prerequisite: CMDS 651.
Study of special areas or new topics in audiology. Previous topical areas include assistive listening devices, central auditory assessment in adults, educational audiology, high frequency audiometry, and advanced concepts in impedance.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

CMDS 661 Assessment of Childhood Language Disorders (3)
Prerequisite: CMDS 545, 563, and 564.
Principles of assessment of language disorders in preschool, school-age, and adolescent populations. Emphasis placed on naturalistic and informal assessments.

CMDS 663 Voice Disorders (4)
Prerequisite: CMDS 567 and 572 (concurrently).
Study of abnormalities of voice production including dysphonia, psychogenic disturbance, and resonance imbalance. Incorporates laboratory demonstrations and exercises to develop skills using the following technologies: video stroboscopy, videoflouroscopy for VPI, manometry, the Visi-pitch, etc.

CMDS 665 Fluency Disorders (3)
Prerequisite: CMDS 567 and 604.
Examines fluency disorders of children and adults. Reviews the literature on etiology and theories of dysfluency. Assessment procedures and therapeutic management are discussed. Includes a review of current technological applications.

CMDS 667 Aphasia (3)
Prerequisite: CMDS 572.
Historical review of the neurological basis of language processing. Emphasis on the speech and language disorders, diagnosis and remediation of patients experiencing right and left cerebral vascular accidents.

CMDS 668 Professional Issues in Audiology and Speech Pathology (1)
Survey of social, political, business and professional issues in health care delivery related to communicative disorders. Other topics include: curriculum vitae preparation, professional interviews, professional liabilities, contracts, and funding sources, quality assurance mechanism, etc. Pass-fail grading only.

CMDS 669 Cognitive Disorders (3)
Prerequisite: CMDS 620 and 667.
Focus on the cognitive communicative disorders resulting from dementia, Alzheimer's, Parkinson's disease, metabolic and drug-induced delirium and traumatic brain injury.

CMDS 670 Advanced Concepts in Amplification (3)
Prerequisite: CMDS 630.
Trends and developments in amplification technology and applications. Implantable devices (including cochlear implants), automatic signal processing, digital amplification, programmable and multi-channel instruments, vibro-tactile aids, etc.

CMDS 671 Clinical Methods in Speech Language Pathology (3)
Prerequisite: CMDS 652 and 661.
Techniques for managing and altering behavior by incorporating theory into practice, eliciting specific language targets and sounds in addition to strategies for interacting with patients and students.

CMDS 672 Assessment of the Vestibular System and Its Disorders (2)
Prerequisite: CMDS 651.
Review of the interactive balance mechanisms: vestibular, oculomotor and proprioceptive systems. Technologies and procedures for assessing and quantifying disorders of equilibrium.

CMDS 680 Medical Speech Pathology (2-3)
Prerequisite: CMDS 572.
Overview of the specific pediatric patient populations typically seen in medical settings such as cerebral palsy, cleft lip and palate, genetic syndromes, tracheostomy and ventilator dependency.

CMDS 690 Dysphagia (3)
Prerequisite: CMDS 572.
Evaluation and treatment of pediatric and adult patients with swallowing disorders. Specific emphasis on bedside dysphagia evaluations, modified barium swallow procedures, FEES, assistive devices, treatment techniques, and diet modifications.

CMDS 695 Special Topics in Speech and Language Disorders (1-3)
Prerequisite: Consent of instructor.
Study of special areas or new topics in speech language pathology. Topics may include counseling, genetic syndromes, multicultural issues, cerebral palsy or management or the burn patient. Topic will be indicated in the semester Schedule of Courses. Maximum of 6 hours of credit.

CMDS 696 Augmentative/ Alternative Communicative (3)
Prerequisite: CMDS 652 and 690.
Provides exposure to the area of augmentative/alternative communication (AAC). Topics include functional dimensions of AAC systems; symbol systems; transmission techniques; and intervention strategies.

CMDS 697 Special Topics in Audiology (1-3)
Prerequisite: Consent of instructor.
Study of special areas or new topics in audiology not included in other courses, such as current technological, political or economic trends in audiology and medicare. Maximum of six hours credit.

CMDS 699 Thesis (1-6)

Computer Information Systems (0545-CIS)

CIS 500 Computer Concepts for Managers (1.5)
Prerequisite: Application Software I and II (ISDP 154 and 155) and Computer Information Systems (CIS 300).
Fundamentals of application based software including spreadsheet, data manipulation and reporting, presentation graphics, and public network access. Pass/fail grading.

CIS 655 Computer Ethics and Social Issues (3)
In-depth examination of the ethical and social aspects of computing. Topics include responsibilities for computer professionals, organizational and work transformation, privacy, social interaction in electronic forums, policy and other current issues. Case studies, in-class discussion, and position papers will be used extensively.

CIS 675 Management Information Systems (3)
Prerequisite: Computer Concepts for Managers (CIS 500).
Provides a broad overview of information systems management. Emphasizes the relationships of information technology to the overall business goals, policies, plans, management style and industry structure. A secondary emphasis is placed on information systems management, with particular attention on planning, organizing, coordinating and managing the information technology assimilation process.

CIS 680 Special Topics in CIS (1-6)
An advanced study of one or more selected topics on issues related to the study of Computer Information Systems.

CIS 698 Research Seminar in CIS (1-6)
Prerequisite: Permission of departmental chair

Computer Science and Engineering (5833-CSE)

CSE 504 Automata Theory (3)
Prerequisite: Discrete Structures (EMCS 410).
Note: Cross-listed with EMCS 504.
Finite state machines and their application to engineering problems including modeling the behavior of discrete systems. Topics include theory of computing, formal language theory, and applications of cellular automata. Engineering models of digital computer hardware are covered and related to software design.

CSE 510 Computer Design (3)
Prerequisite: Logic Design (EE 210) and assembly language experience as covered by Computer Interfacing (EE/EMCS 412), Introduction to Computer Science and Engineering (EMCS 301), or experience acceptable to the instructor.
Corequisite: CSE 511.
Note: Cross-listed with EE/EMCS 510.
Review of logic design and elementary computer organization. Design of the central processing unit, memory control, and input-output portions of a computer. The VHDL hardware design language will be used.

CSE 511 Computer Design Laboratory (1)
Prerequisite: Logic Design (EE 210).
Corequisite: CSE 510
Note: Cross-listed with EE 511
Experiments in the design of the central processing unit, memory, control, and input-output portions of a computer using VHDL and Mentor Graphics for software simulation.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

CSE 515 Introduction to VLSI Systems (3)
Prerequisite: Logic Design (EE/EMCS 210).
Corequisite: EE/EMCS 510, and EE 514, or consent of instructor.
Note: Cross-listed with EE 515.
MOS devices and circuits, electrical and logic design principles. Fabrication steps, design rules, electrical parameter extraction, delays. Logic/switch arrays, dynamic precharge logic, precharge forms, finite state machines, registers, memories, subsystem design examples.

CSE 530 Design of Compilers (3)
Prerequisite: Design of Operating Systems (EMCS 420), CSE/EMCS 504.
Note: Cross-listed with EMCS 530.
Engineering descriptions of algorithmic language. Study of syntax, semantics, ambiguities, procedures, replication, iterations, and recursion in the language. Engineering design of a compiler.

CSE 545 Artificial Intelligence (3)
Prerequisite: Design of File Structures (EMCS 335) and Use of Selected Programming Languages-LISP (EMCS 303).
Note: Cross-listed with EMCS 545.
Topics covered include rationale and use of heuristic approaches to engineering problem solving. Information processing models as an explanation of human perceptual, cognitive and affective behaviors. Applications involving the concepts and problems in artificial intelligence engineering.

CSE 550 Software Engineering (3)
Prerequisite: Design of Operating Systems (EMCS 420).
Note: Cross-listed with EMCS 550.
Engineering methods of development applied to design of large-scale computer software. Hierarchies of control structures, top down programming, structured programming, language selection, extensibility and portability, software reliability, quality assurance, and project management. A written project report and an oral presentation are required.

CSE 608 Advanced Design of Operating Systems (3)
Prerequisite: Design of Operating Systems (EMCS 420).
Note: Cross-listed with EMCS 608.
Formal study of algorithms arising in the engineering design of operating systems. Models will be designed and analyzed as to performance measures and optimality. Topics include management protection, security, concurrency, and resource allocation.

CSE 610 Advanced Logic Design (3)
Prerequisite: Logic Design (EE/EMCS 210).
Note: Cross-listed with EE/EMCS 610.
Models and elementary properties of sequential machines, sequential machine compatibility and equivalence, state assignment and state minimization.

CSE 611 Computer Architecture (3)
Prerequisite: EE/EMCS 510.
Note: Cross-listed with EE/EMCS 611.
Classification of computer designs. PMS and ISP descriptions. Study of major systems of current and historical interest.

CSE 619 Design and Analysis of Computer Algorithms (3)
Prerequisite: Design of File Structures (EMCS 335) and Discrete Structures (EMCS 410).
Note: Cross-listed with EMCS 619.
The engineering design of efficient computer algorithms. A study of the relationships among algorithmic statements, data structures, and the resulting computational complexity of algorithms. An engineering analysis of the effect of the computer implementation of the algorithmic statement on the computational complexity. Categorization of algorithms into complexity classes.

CSE 630 Data Base Design (3)
Prerequisite: Design of File Structures (EMCS 335).
Note: Cross-listed with EMCS 630.
Advanced engineering oriented design for information storage and retrieval. The emphasis will be placed on engineering design and implementation of relational hierarchical and network data base systems. A written project report is required.

CSE 632 Pulse and Digital Waveforms (3)
Prerequisite: Active Network Design I (EE 421) or consent of instructor.
Corequisite: EE 631.
Note: Cross-listed with EE 630.
Analysis and design of clippers, clampers, Schmitt triggers, precision rectifiers, peak detectors, monostables, astables, function generators, sine shapers, track-and-hold circuits, digital-to-analog and analog-to-digital converters, and current mode circuits are among the topics discussed. The course emphasizes piecewise-linear analysis.

CSE 693 Dissertation Research (1-24)
Prerequisite: Consent of advisor.

CSE 694 Special Topics in Computer Science & Engineering (1-6)
Prerequisite: Consent of advisor.

CSE 695 Seminar in Computer Science & Engineering (1)
Prerequisite: Consent of advisor.
Pass/Fail grading.

CSE 696 Independent Study in Computer Science & Engineering (1-6)
Prerequisite: Consent of advisor.

CSE 790 Special Topics in Computer Science & Engineering (1-6)
Devoted to advanced topics that are not treated in the general courses. Topics will be announced in the Schedule of Courses.

Early and Middle Childhood Education (0715-EDEM)

EDEM 501-502 Independent Study in Early and Middle Childhood Education (1-3)
To be arranged with the dean.

EDEM 505 Infant/Toddler Development and Care (3)
Prerequisite: Suitable child development background approved by instructor.
The first half of the course focuses on child development from conception to age 3. The second half of the course covers child care programs and child guidance strategies for infants and toddlers.

EDEM 506 Study of Multiethnic Education (3)
Cultural differences of children from varying ethnic groups are treated as strengths. Students are exposed to ways cultural patterns influence cognitive styles.

EDEM 507 Child and Family Studies Seminar I (1)
Linking seminar with other academic specialty area courses and Core I.

EDEM 508 Child and Family Studies Seminar II (1)
Prerequisite: EDEM 507, may be taken concurrently.
Seminar linking content and experiences in community and family systems (Core II) with other academic specialty area courses.

EDEM 509 Child and Family Studies Seminar III (1)
Prerequisite: EDEM 507, may be taken concurrently.
Seminar linking content and experiences in school settings for children (Core III) with other academic specialty area courses.

EDEM 511 Reading and Writing in Content Areas (3)
Prerequisite: 12 hours in education or psychology, or consent of instructor.
Note: Cross-listed with EDSD 511.
A comparison of the developmental and remedial reader at the middle and secondary levels, with emphasis on developing instructional strategies, materials, and programs in middle and secondary content areas.

EDEM 512 Core III: Middle Grades Seminar (1)
Prerequisite: EDUC 501, EDUC 502, EDEM 507, EDEM 508.
Corequisite: EDUC 504
Seminar linking content of EDUC 504 with field experiences in middle school settings.

EDEM 521 Student Teaching K-4 (4-6)
Prerequisite: Admission to the School of Education; Phase I, II, and III; Human Development & Learning (ECPY 305); 2.50 overall grade-point average; 2.50 grade-point average in major.
Restricted to post-baccalaureate and graduate students seeking K-4 certification. Experience in the classroom and in the total school program in observation and supervised teaching at the K-4 level.

EDEM 531 Seminar in Early Childhood Education (1-4)
An analysis of issues and problems in early childhood education.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDEM 540 Teaching Adolescent Readers (3)
Note: Cross-listed with EDSD 540.
Examines active reading processes, instructional strategies, and appropriate adolescent literature for teaching both the developmental and the remedial reader in secondary language arts.

EDEM 552-553 Student Teaching in Grades 5-8 (4-4)
Prerequisite: Early Childhood Education Practicum (EDEM 411), Reading in the Middle Grades (EDEM 413), Teaching Middle School Mathematics (EDEM 415), Teaching Social Studies in the Middle Grades (EDEM 417), Teaching Science in the Middle Grades (EDEM 419); 2.5 grade point average in professional education courses; 2.5 overall grade point average.
Supervised observations and experience in the middle grades (5-8) classroom and total school program. Restricted to postbaccalaureate and graduate students seeking certification in grades 5-8.

EDEM 581 Teaching for Talent Development (3)
Classroom and school-level approaches to identifying, nurturing, and further developing a variety of talents in all children, including but not limited to the areas of intellectual, academic, creative, visual/performing arts, and leadership talent.

EDEM 582 Teaching Gifted Students in the Regular Classroom (3)
Introduction to the nature and needs of gifted, talented, and creative children in K-12 classrooms, ways to meet these needs, and ways to increase gifted behaviors in a greater number of children than those already identified.

EDEM 590 Teacher Institute on African-American Issues (3)
Note: Cross-listed with EDSD 590 and PAS 529.
An introduction to Pan-African Studies focusing on multicultural educational strategies for public school educators.

EDEM 591 Survey of African History and Culture for Teachers (3)
Note: Cross-listed with EDSD 591 and PAS 530.
An intensive survey of the history and culture of Africa (to 1600) for teachers.

EDEM 592 Survey of African-American History and Culture for Teachers (3)
Note: Cross-listed with EDSD 592 and PAS 531.
An intensive survey of the history and culture of African-Americans for teachers.

EDEM 596-597 Seminar in Elementary Education (1-4)
The investigation of special problems in education.

EDEM 602 Elementary School Curriculum (3)
An analysis of theoretical foundations of curriculum, contemporary curriculum projects, curriculum evaluation, and strategies for constructing and implementing curriculum.

EDEM 603 The Foxfire Approach to Teaching (3)
Note: Cross-listed with EDSD 603.
Provides a thorough working knowledge of philosophy and pedagogy found in the Foxfire approach, a learner-centered approach to classrooms. Prepares teachers at all levels to articulate, accept as valuable, and begin to develop the skills necessary to implement the eleven core practices of the Foxfire approach. Designed for teachers of children grades K-12.

EDEM 604 Special Problems or Field Experience in Curriculum Development (1-6)
Intensive study in a current problem in an area of curriculum development or curriculum construction.

EDEM 605 Action Research for Classroom Teachers (3)
Note: Cross-listed with EDSD 635.
Involves teachers in identifying questions about their own teaching and classroom situations, developing research methods appropriate for addressing those questions, and conducting a classroom-based study. Pass/Fail only.

EDEM 607 Middle Grades Curriculum (3)
A basic study of philosophy, organizational patterns, and curriculum concepts relating to teaching in the middle grades.

EDEM 608 Integrated Thematic Units (3)
Enables participants to design units integrating several disciplines around an appropriate theme in ways that are appropriate for a diverse group of students.

EDEM 609 Advanced Middle Grades Curriculum (3)
Prerequisite: EDEM 607 or EDUC 504 or consent of instructor.
An advanced examination of curriculum appropriate for the middle school, including integrated, affective, exploratory, differentiated, and authentic curriculum and assessment.

EDEM 610 Literacy Research & Theory (3)
Prerequisite: 12 hours in education, to include one introductory course in the teaching of reading.
An advanced course in reading instruction providing an intensive analysis of current research in the theories and strategies of teaching in the elementary and middle school.

EDEM 613 Remediation in Literacy I (3)
Prerequisite: EDEM/ EDSD 511 or EDEM 406 or EDEM 413 or consent of instructor.
Note: Cross-listed with EDSD 613.
A study of diagnostic techniques, materials, and strategies for classroom remediation of reading problems at the secondary level.

EDEM 614 Remediation in Literacy II (3)
Prerequisite: EDEM 610.
Focuses on classroom measurement, teaching techniques and strategies, and materials for instruction of the underachieving reader.

EDEM 615 Measurement and Evaluation in Literacy (3)
Prerequisite: EDEM 610.
An introduction to diagnostic concepts in reading, with an emphasis on screening instruments, materials, and tutoring procedures.

EDEM 616 Advanced Clinical Procedures in Literacy (3)
Prerequisite: EDEM 615 or consent of the instructor.
Testing and evaluation of severely disabled readers in a clinical situation, with an emphasis on test interpretation and prescriptive case-study writing.

EDEM 617 Supervision of Literacy Programs (3)
Prerequisite: EDEM 616 or consent of the instructor.
Management and supervision of a reading clinic with an emphasis on interdisciplinary clinical staffing and parent involvement.

EDEM 618 Practicum in Literacy (3)
Prerequisite: EDEM 616 or equivalent, or consent of instructor.
Supervised internship providing for analysis and refinement of assessment and instruction practices in reading. Settings determined with pupil consultation.

EDEM 619 Environmental Education Institute: The Study of Rural and Urban Watersheds (3)
Note: Cross-listed with EDSD 619.
Using a watershed as the focus, this course will examine the impact people have on the environment. Through field trips, community speakers, individual and group research, the students will document the aesthetic, cultural and ecological aspects of a watershed. Participants in the course will be able to use the approach modeled in the course with their students on any watershed.

EDEM 620 Introduction to Teaching Elementary Mathematics Education (3)
An investigation of trends, learning theories, instructional activities, and manipulative materials applicable to mathematics education in the elementary school.

EDEM 621 Advanced Methods for Teaching Elementary Mathematics (3)
Prerequisite: A course in teaching elementary mathematics.
An advanced course investigating trends, learning theories, instructional activities, and manipulative materials applicable to mathematics education in the elementary school.

EDEM 622 Assessment and Instruction in Mathematics Education (3)
Prerequisite: EDEM 620 or 621 or consent of instructor.
A study of methods for assessing students' knowledge and ability in mathematics, and of instructional strategies for increasing students' knowledge and ability in mathematics.

EDEM 623 Integrating Mathematics with Other Content Areas (3)
Prerequisite: A course in teaching elementary mathematics.
An investigation of theories, methods, and materials for integrating mathematics with other content areas. Content areas may vary.

EDEM 625 Special Topics in Mathematics Education (3)
Prerequisite: A course in mathematics education.
A study of current topics in mathematics education. Topics are chosen according to the student's interests and the needs of the program.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDEM 627 Applied Child Development (3)
Examination of physical, cognitive, language, affective and social development of children from conception to age five. Emphasis will be on knowledge and understanding of child development as it pertains to typically and atypically developing children in an educational setting.

EDEM 628 Teaching Middle School Mathematics (3)
Prerequisite: A course in teaching mathematics.
An investigation of curriculum materials, instructional activities, and manipulative aids applicable to mathematics courses in the middle and junior high school.

EDEM 629 Teaching Mathematics with Technology (3)
Prerequisite: A course in mathematics education.
Focuses on using technology as a tool in the teaching of mathematics in elementary and middle school.

EDEM 630 Theories of Child Development (3)
Analysis and comparison of psychoanalytic, cognitive behavioral perspectives of child development. Traces growth and development of children 0-12 years as the foundation for curriculum development.

EDEM 631 Analysis of Curriculum Models in Early Childhood Education (3)
Prerequisite: EDEM 627.
Analysis of programs for young children, e.g., DARCEE, B-E, Behavior Analysis, British Infant Model, Piagetism-based program. Emphasis on planning learning environments, content areas within the early childhood program, instructional materials, evaluation of learning, and personnel within the early childhood setting.

EDEM 632 Curriculum Problems in Early Childhood Education (3)
Prerequisite: EDEM 627.
Examination of contemporary curriculum development in programs for young children. Emphasis on contemporary education, methodology and strategies for dealing with children from diverse cultural backgrounds, materials and facilities in early childhood education.

EDEM 633 Curriculum and Methods for Early Childhood Special Education (3)
Prerequisite: EDEM 627.
Note: Cross-listed with EDSP 633.
Exploration of early childhood models, strategies, and materials appropriate for use with special needs children.

EDEM 634 Day Care (3)
Examines day care programs, day care quality, and effects of day care attendance on young children and on parent-child relationships.

EDEM 635 Administration and Consultations: Day Care and Early Childhood Education (3)
Responsibilities of the day care or early childhood program director and the early childhood consultant.

EDEM 636 Theories of Play (3)
Investigation of the significance of play as related to development of language, cognitive processes, and affective life of the young child. Study of the use of play within psychodrama, therapy, and educational programs for young children.

EDEM 638 Advanced Practicum in Early Childhood Education (4)
Prerequisite: EDEM 630, 631 and 632.
(a) Supervised classroom experience under the guidance of experienced teachers in educational programs for young children; or, (b) a supervised internship in both an administrative and a supervisory role in programs for young children.

EDEM 640 Language Arts in the Elementary School (3)
Prerequisite: 12 hours in education, to include one introductory course in the teaching of the language arts.
An advanced course in language arts instruction. Emphasis is on analyzing trends and problems in the teaching of listening, speaking, and writing skills and the relationship of each skill to the total curriculum.

EDEM 642 Literacy Learning and Cultural Differences (3)
Explores the current knowledge base and theoretical frameworks used to explain differential achievement rates between students of diverse cultural, ethnic, and linguistic backgrounds.

EDEM 644 The Authoring Cycle (3)
Prerequisite: Preservice course in literacy or consent of instructor.
Examines reading/writing connections and the role of literacy in learning. Presented as a workshop in which students engage in reading and writing to learn. Students are exposed to strategies for organizing appropriate curricula and supporting learners as they experience the benefits of this learning approach themselves.

EDEM 645 Advanced Studies of Children's Literature (3)
Prerequisite: Previous undergraduate language arts/literature course or permission of instructor.
Explores literature available for preschool through 8th grade; studies the role of literature in child development and curriculum; identifies trends and issues; and develops evaluative criteria.

EDEM 646 Literature in the Secondary Language Arts Curriculum (3)
Prerequisite: Experience teaching English or language arts in the middle or senior high school, a course in methods of teaching English in the secondary school, or consent of instructor.
Note: Cross-listed with EDSD/ENGL 646.
Examines theories behind the teaching of literature, research in teaching literature, and current trends in teaching literature in the secondary language arts or English class.

EDEM 647 Teaching Writing and Language in the Secondary School (3)
Prerequisite: Experience teaching English or language arts in the middle or senior high school, a secondary school, or consent of instructor.
Note: Cross-listed with EDSD/ENGL 647.
Examines research, rationales, and methodology involved in teaching writing and language study (grammar, usage, vocabulary, spelling) in the secondary language arts or English Class.

EDEM 648 Literature-Based Curriculum (3)
Explores the "whys" and "hows" of literature-based curriculum and instruction. Emphasis on building a learning community, reviewing current children's literature, literature-based curriculum development models, literature-based instruction, and literature-based unit development.

EDEM 649 Using Literacies and Tools to Learn: Inquiry in the Classroom (3)
Examines the theoretical underpinnings and practical implementation of inquiry-based learning by creating an intensive inquiry experience/curriculum for students. By "living" the curriculum, students will come to understand how inquiry experiences are initiated and maintained, how to merge them with curriculum "have to's," and how to integrate real world resources in meaningful ways for learners.

EDEM 650 Science Education in the Schools (3)
Note: Cross-listed with EDSD 650.
Examines socioeconomic, political, cultural, and other forces that have impact on the teaching of science in U.S. schools.

EDEM 651 Expanding Classroom Walls: Forests, Parks, and Backyards (3)
Provides information and experience needed to effectively gear the life and earth science concepts and strategies found in a forest or park setting to classroom learning.

EDEM 652 Workshop in Science Education (1-6)
Note: Cross-listed with EDSD 652.
A workshop dealing with materials and techniques in teaching science; includes development and evaluation of innovative and practical service projects using teaching strategies.

EDEM 653 Instructional Procedures in Science: Zoos (3)
Provides background information and experience needed to effectively teach animal adaptation, animal endangerment, diversity of lifestyle and the application of these learnings to classroom instruction.

EDEM 654 Analysis of Programs of Elementary Science (3)
Prerequisite: Teaching Science in the Elementary School (EDEM 404), or Teaching Science K-4 (EDEM 324) or Teaching Science in the Middle Grades (EDEM 419) or consent of instructor.
An intensive study of experimentally designed curriculum models such as Science Curriculum Improvement Study (SCIS), Elementary Science Study (ESS), and Science-A Process Approach (SAPA).

EDEM 655 Science and Technology Education in Informal Settings (3)
Examines learning in informal education sites and develops appropriate instructional programs.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDEM 656 Science Education for Middle Schools (3)
Prerequisite: Teaching Science in the Elementary School (EDEM 404), or Teaching Science K-4 (EDEM 324) or Teaching Science in the Middle Grades (EDEM 419) or EDSD 556 or consent of instructor.
Note: Cross-listed with EDSD 656. Planning and designing individualized program of teaching science; demonstration of teaching techniques; analysis of research related to science curriculum.

EDEM 657 Instructional Procedures in Science (3)
Note: Cross-listed with EDSD 657. Concentrates on newer methods and techniques for presenting materials (e.g., team teaching, learning stations, packets, contracting) as they apply to the science classroom.

EDEM 658 Science Curriculum in the Schools (3)
Prerequisite: EDEM/EDSD 650 or consent of instructor.
Note: Cross-listed with EDSD 658. Examines curriculum programs, the settings in which they are intended to function, and other considerations for building a school program in science.

EDEM 659 Current Issues in Science Education (3)
Prerequisite: EDEM/EDSD 650.
Note: Cross-listed with EDSD 659. Analyzes systems and forces that currently influence science education. Emphasizes creative solutions to the problems these forces create.

EDEM 660 Social Studies in the Elementary School (3)
Prerequisite: Teaching Social Studies K-4 (EDEM 322) or Teaching Social Studies in the Elementary School (EDEM 402) or consent of instructor.
An advanced course in teaching social studies; appraisal of materials and newly developed social studies program use of effective teaching techniques; analysis of relevant research studies.

EDEM 661 Alternative Approaches to Assessment in Science (3)
Examines alternative approaches to assessing instruction and learning in science classrooms.

EDEM 662 Workshop in Social Studies Education (3)
Note: Cross-listed with EDSD 662. Experience with content, techniques, and materials for teaching social studies in elementary and secondary schools. Offered each summer.

EDEM 663 Research in Life Sciences: Ethology for Middle Grades (3)
Provides an introduction to observational methods of studying animal behavior and the scientific methods.

EDEM 664 Trends in Social Studies Education (3)
Note: Cross-listed with EDSD 664. A study of recent trends in social studies, recent developments and new methodologies in teaching social studies, examination of materials and projects especially prepared for social studies teachers.

EDEM 665 Science: Biomes and Habitats (3)
Focuses on planning and designing lessons in the teaching of life science concepts in the context of the major biomes and habitats of the world.

EDEM 666 Consumer Economics in the Classroom (3)
Note: Cross-listed with EDSD 666. Includes consumer topics, behavior and problems. Teaching strategies and materials appropriate for teaching consumer education will be emphasized.

EDEM 667 The Media & Consumer Education (3)
Note: Cross-listed with EDSD 667. Examines mass media with special attention to marketing and advertising principles and practices. Directly applies these principles and practices to the elementary and secondary curriculum.

EDEM 668 Workshop in Economic Education (3)
Note: Cross-listed with EDSD 668. Basic economic content, techniques and materials for integrating economics into elementary and secondary subjects.

EDEM 669 Economic Education Curriculum and Teaching (3)
Note: Cross-listed with EDSD 669. Examines economic content, materials and strategies. Economic education teaching units are developed, taught and evaluated.

EDEM 672 Elementary: Orientation and General Methods (3)
Prerequisite: Admission to the MAT and Grades K-4 Professional Year Teacher Education Program. Orients students to the professional year's goals, content, organization, requirements, and assessment as well as to general methods of constructivist teaching for all young children (e.g., from diverse cultures, with and without disabilities, with and without exceptionalities).

EDEM 673 Teaching Methods for Grades K-4: Professional Year (9)
Prerequisite: Admission to the MAT and Grades K-4 Professional Year Teacher Education Program. Examines specific strategies and practices for teaching children with and without disabilities, giftedness, and other individual differences in grades K-4. May be repeated, a minimum of 18 hours required.

EDEM 674 Topical and Culminating Seminars (3)
Prerequisite: Admission to the MAT and Grades K-4 Professional Year Teacher Education Program. Cohort group meeting at least every two weeks to focus on student experiences, reactions, concerns; personal/interpersonal orientation. Minimum of six hours required.

EDEM 675 Elementary: Case Studies (3)
Prerequisite: Admission to the MAT and Grades K-4 Professional Year Teacher Education Program. Focuses on specific challenges teachers might confront and provides an opportunity for analysis, proposal strategies, and discussion of possible solutions.

EDEM 676 Field Experiences/Student Teaching (3)
Prerequisite: Admission to the MAT and the K-4 Professional Year Teacher Education Program. Provides opportunities to be responsible for instruction, with the guidance and support of classroom teachers and university faculty, across the professional year. A minimum of six hours required.

EDEM 681 Teaching Through Investigations (3)
Prerequisite: EDFD 600.
An examination of the nature of more investigation-oriented approaches to K-12 curriculum, including problem-based learning, original research, and authentic assessment strategies.

EDEM 682 Thinking and Problem Solving (3)
An examination of the nature of thinking and problem solving as well as various approaches to the nurturing and direct teaching skills and problem solving in grades K-12.

EDEM 683 Creativity (3)
A consideration of the nature of creativity, characteristics of creative individuals, curricular and instructional approaches that nurture creativity in grades K-12, and ways to assess creativity.

EDEM 684 Practicum in Gifted Education (3)
Prerequisite: EDEM 581 or 582 and two of the following: EDEM 681, 682 or 683, 685 or 686. Application of knowledge, skills, and competencies delineated in the basic courses in gifted/talented education.

EDEM 685 Special Topics in Gifted Education (3)
Current topics in the education of the gifted. Course topics will vary as needed.

EDEM 686 Learning Styles: Curriculum & Instruction (3)
An examination of learning style theory and its personal and professional implications for K-12 school personnel, especially curricular and instructional applications.

EDEM 689 Middle Grades: Orientation and General Methods (3)
Prerequisite: Admission to the MAT, Grades 5-8 Professional Year Teacher Education Program and successful completion of EDEM 689.
Orients students to the professional year's goals, content, organization, requirements, assessment, and field placement as well as to general methods of constructivist teaching.

EDEM 690 Teaching in the Middle Grades (9)
Prerequisite: Admission to the MAT, Grades 5-8 Professional Year Teacher Education Program and successful completion of EDEM 689.
Examines strategies and practices for successful teaching in the middle grades, including curriculum and instruction with the disciplines, thematic instruction, exploratory programs, advisor-advisee programs, and working effectively in a team setting. May be repeated, a minimum of 24 hours required.

EDEM 691 Seminar (3)
Prerequisite: Admission to the MAT and Grades 5-8 Professional Year Teacher Education Program. Small group discussion/workshop sessions on selected topics related to the professional year.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDEM 692 Middle Grades: Case Studies (3)
Prerequisite: Admission to the MAT and Grades 5-8 Professional Year Teacher Education Program.
Focuses on specific challenges teachers might confront; and provides an opportunity for analysis, problem solving, and discussion of potential solutions and their implications.

EDEM 693 Middle Grades Field Experiences/Student Teaching (3)
Prerequisite: Admission to the MAT and the 5-8 Professional Year Teacher Education Program
Provides opportunities to be responsible for instruction, with the guidance and support of mentor teachers and university faculty, across the professional year. A total of 6 hours is required.

EDEM 694 Special Topics in Literacy (1-6)
Prerequisite: Two courses in reading education including foundations of reading course, and consent of instructor.
Current topics in reading education. Course topics will vary as needed.

EDEM 695 Professional Internship in Instructional Development (1-5)
Prerequisite: Normally taken during last semester of degree.
Supervised professional experience in an instructional development agency and career information for instructional developers. By arrangement with advisor and instructor. Maximum of 3 credits per semester; 5 credits per degree program. For each credit hour taken there is a minimum 3 hr. per week fall and spring; 9 hr. per week summer.

EDEM 696 Independent Study in Early or Middle Childhood Education (1-3)
By arrangement with dean and advisor.

EDEM 698 Supervised Readings (1-2)
By arrangement with dean and advisor.

EDEM 699 Thesis or Professional Paper (2-5)
Prerequisite: EDFD 600 or equivalent; consent of dean and advisor.

EDEM 710 Advanced Study in Literacy (3)
Prerequisite: 12 semester hours in reading instruction; EDFD 600 or consent of instructor.
Surveys research in literacy and related communication skills in relation to the total curriculum; a comparison and evaluation of emerging programs, with consideration given to design and development of projects in reading and related skills.

EDEM 720 Implications of Research in Mathematics Education (3)
Prerequisite: Consent of instructor.
A survey of mathematics research regarding its implications for mathematics education and its implementations in educational systems.

EDEM 730 Research in Infancy and Early Childhood (3)
Prerequisite: EDFD 600 and EDEM 696.
Development of research design in infant and early childhood education. Methods and techniques in the study of children. Each student designs and completes a research problem.

EDEM 740 Seminar in Curriculum Theory and Design (3)
Prerequisite: An introductory course in curriculum or consent of instructor.
Note: Cross-listed with EDSD 740.
An advanced study of theories of curriculum structure and content; recent research and implications for curriculum design.

EDEM 796 Research Literature (1-6)
For Ed.S. candidates only.

EDEM 798 Field Study (2)
For Ed.S. candidates only.

EDEM 799 Professional Paper (1-5)
For Ed.S. candidates only

Economics (0550-ECON)

ECON 500 Economics (3)
Note: Fulfills a Foundation Core requirement only.
Analysis of national income and employment theory. Value and distribution theory, including the theory of price determination of various market structures and the theory of household behavior.

ECON 600 Managerial Economics (3)
Prerequisite: ECON 500, computers and elementary calculus.
The understanding and application of economic theory to the problems of the business enterprise. The use of economic concepts for managerial decision making. Demand theory, market structures, pricing, government regulations, and international competitiveness are among the topics covered.

ECON 605 Studies in Urban Economics (3)
Prerequisite: ECON 500.
Note: Cross-listed with PADM 640/UPA 603.
Analysis of urban economic problems stressing the economic efficiency and equity issues of local public policy. Specific attention is given to the growth of cities and how cities respond to changes in technology overtime.

ECON 610 Public Policy Toward Business (3)
Prerequisite: ECON 500.
Emphasis on economic analysis of governmental policies toward business, including antitrust regulation, and public ownership analyzed in the context of different market structures. Some attention is given to political and social considerations.

ECON 620 Economic Conditions and Forecasting (3)
Prerequisite: ECON 500, MGMT 501 and a graduate computer course; or consent of instructor.
Combines the dynamics of economic change and fluctuation and techniques of forecasting. Applications of techniques and economic analysis are made to the firm, industry, and aggregate economy. Different statistical techniques, including regression analysis, are discussed as forecasting tools.

ECON 640 Public Finance (3)
Prerequisite: ECON 500.
Note: Cross-listed with UPA 646.
The theories and principles of taxation, the economic impact of different taxes, the public debt, and fiscal policy are discussed. Taxation of the business firm is also discussed.

ECON 644 Health Economics (3)
Provides a comprehensive groundwork in the economics of health care, analyzes issues in the health sector from an economic perspective, and examines effects of changes in the health care market.

ECON 650 Macroeconomic Theory (3)
Prerequisite: ECON 500 and elementary calculus.
Note: Cross-listed with UPA 625.
Aggregate income and employment theory. Classical and Keynesian models; monetary and fiscal policy; the theory of growth and cycles.

ECON 660 Microeconomic Theory (3)
Prerequisite: ECON 500 and elementary calculus.
A thorough examination of the theory of household and firm. Determination of price under different market structures.

ECON 670 The International Economy (3)
Prerequisite: ECON 500.
A discussion of current problems of the international economy and their effects upon the firm. Particular stress is placed upon the role of private capital in the developed and the developing economies. Not regularly offered.

ECON 680 Special Topics in Economics (1-6)
An advanced study of one or more selected topics or issues related to the study of Economics.

ECON 698 Research Seminar in Economics (1-3)
Prerequisite: One 600-level economics course and permission of the departmental chair.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Education (0722-EDUC)

EDUC 501 Pre-Teacher Education Core I (3)
Core I focuses on human development and learning issues through a field-based study of Pre-K through Grade 12 school setting.

EDUC 502 Pre-Teacher Education Core II (3)
Core II focuses on sociological, political and cultural influences on the educational process for children and youth with and without disabilities through readings and a field-based study in community service.

EDUC 503 Pre-Teacher Education Core III: Elementary Education (3)
Prerequisite: EDUC 501 and EDUC 502 (Core I & Core II)
Focuses on how schools, classrooms, and learning experiences are designed to meet the developmental needs of all young children (e.g., from diverse cultures, with and without disabilities, with and without exceptionalities).

EDUC 504 Pre-Teacher Education Core III: Middle Grades (3)
Prerequisite: EDUC 501 and EDUC 502 (Core I & Core II)
Core III (Middle Grades) will focus on the underlying philosophies, administrative structures, and general approaches to meeting the needs of early adolescents in a middle school setting.

EDUC 505 Pre-Teacher Education Core III: Secondary School (3)
Prerequisite: EDUC 501 and EDUC 502 (Core I and II)
Provides opportunities to survey the field of secondary education through the study of educational theories, directed field experiences, and personal evaluation of education as a career of choice. Twenty hours of classroom field work and additional hours of community service required.

EDUC 620 Art Student Teaching in the Elementary/Secondary Schools I (4)
Prerequisite: Admission to the MAT Program.
Corequisite: EDSD 609 and EDSD 610.
Provides supervised observation, participation and teaching.

EDUC 621 Art Student Teaching in the Elementary/Secondary Schools II (4)
Prerequisite: Admission to the MAT Program.
Corequisite: EDSD 609 and EDSD 610.
Provides supervised observation, participation and teaching.

EDUC 629 Interdisciplinary Seminar in Early Childhood (3)
An interdisciplinary seminar focusing on a variety of topics and issues relevant to early childhood.

EDUC 790 Doctoral Dissertation Seminar (3)
Prerequisite: Basic knowledge, understanding, and skill competency in research design, methodology, and analysis and most doctoral coursework completed.
Doctoral students will be provided an opportunity to critique and report on research from various fields, conceptualize and formulate ideas and topics, and develop a formal presentation and defense of a research proposal.

EDUC 795 Doctoral Research (1-15)
Prerequisite: Completion of coursework for Ed.D. program or successful completion of comprehensive examinations.
Note: Cross-listed with EDAD/ECPY/EDSP 795.

Educational and Counseling Psychology (0726-ECPY)

ECPY 501-502 Independent Study in Educational Psychology (1-3)
To be arranged with the dean.

ECPY 512 Learning and Cognition in Education (3)
Prerequisite: Consent of instructor.
A survey of major theoretical models in the area of cognition and learning. Emphasis upon applications of theory in the classroom and in counseling. Implications are drawn from several models and contrasted in the context of the individual student's readiness, motivation and aptitude.

ECPY 513 Individual Differences in Education (3)
Prerequisite: Consent of instructor.
A survey of individual differences in socio-cognitive and personality areas of development based upon current literature. Ways to meet individual and group needs in educational settings; interpretation of individual differences for effective classroom instruction.

ECPY 525-526 Topical Studies in Educational Psychology I, II (1-3)
Prerequisite: Consent of instructor.
Investigation of current concerns and issues in educational psychology.

ECPY 527-528 Workshop in Educational Psychology I, II (1-4)
Prerequisite: Consent of instructor.
Topical workshop on educational psychology concerns.

ECPY 540 Evaluation and Measurement in Education (3)
Intended to acquaint the student with evaluation and measurement in education and counseling. Two types of evaluative instruments are studied: the teacher's own tests and evaluation devices, and standardized tests.

ECPY 596-597 Seminar in Guidance (1-4)
Prerequisite: Majors are urged to take seminars prior to or concurrent with practicum.
The investigation of special problems in counseling.

ECPY 600 Introduction to Counseling and Psychotherapy (3)
Information and skills necessary for beginning the practice of counseling and psychotherapy. Course introduces ethics, professional issues, service settings and basic counseling skills. Course is designed as a laboratory course. 2/3 of course is lecture and 1/3 of course is lab.

ECPY 605 Human Development (3)
Survey of the principles of development from conception to adulthood, emphasizing biological, environmental, and cultural factors affecting development.

ECPY 611 Learning Systems: Theory and Practice (3)
Major theoretical models in the area of instruction and learning; application of theories in everyday learning situations in the classroom and in counseling, with special attention to behavior modification and programmed instruction. Implications drawn from several models are contrasted in the context of the individual student's characteristics.

ECPY 619 Theories of Counseling & Psychotherapy (3)
The study of major theoretical positions in counseling and psychotherapy; implications for research and practice.

ECPY 620 Classroom Based Guidance/Counseling
An introductory survey of counseling principles, procedures, functions, and techniques, with emphasis on classroom application. To be given in the interdisciplinary context of an effective program.

ECPY 621 Differential Diagnosis and Treatment in Counseling (3)
Prerequisite: Consent of instructor for non-majors.
Diagnostic procedures and differential treatment strategies for use by counselors and others in the helping professions.

ECPY 624 Organization and Administration of Secondary School Counseling (3)
Prerequisite: ECPY 521
Organization and administration of a counseling program in the secondary school. Patterns for implementation of the services of: counseling, testing, consultation, information and placement.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

ECPY 625 Elementary School Counseling (3)
Prerequisite: ECPY 512 and ECPY 521.
Organizational overview of elementary school counseling; career development in middle childhood; the role and function of the elementary school counselor. Study and application of counseling and consulting techniques appropriate to the elementary school setting.

ECPY 626 Consultation (3)
Prerequisite: 8 hours in guidance.
Provides school counselors, certified professional counselors, psychologists, and other with mental health professionals with models and techniques for consulting across organizations, communities, families, parents, and teachers, especially in an urban setting.

ECPY 628 Theories and Techniques of Counseling Children (3)
Prerequisites: ECPY 521, 651. Non-majors must have consent of instructor.
Intensive study of counseling theories and techniques with children. Prepares students for counseling practice with children.

ECPY 629 Theories and Techniques of Counseling and Psychotherapy (3)
Prerequisite: ECPY 600 or 660. School counseling students should take ECPY 629 after completion of Rank II courses.
Focuses on methods and techniques of counseling. Theory and research will be studied including training in current professional practice and empirically supported approaches to therapy with an emphasis on cognitive, behavioral and affective theory.

ECPY 631 Adolescence (3)
Prerequisite: Human Development & Learning (ECPY 305) or Introduction to Psychology (PSYC 201).
Examination of current socio-psychological research on developmental patterns associated with puberty, identity, cognition, and socio-emotional growth. Analysis of various theoretical models

ECPY 634 Family Systems Process (3)
Prerequisite: Permission of major advisor.
Content will cover family life cycle development, healthy family functioning, life cycle issues of the divorced and blended family and an introduction to assessment indicators.

ECPY 635 Family Assessment Concepts (3)
Prerequisite: FMTH 600/ET 640
Focuses on theoretical concepts from the major theories of family systems therapy with an emphasis on assessment and treatment planning. Therapist skills in assessment interviewing will be discussed and simulated.

ECPY 636 Family Assessment Practice (3)
Prerequisite: FMTH 600/ ECPY 634/ET 640; FMTH 601/ECPY 635/ET 641; and concurrent with second semester of practicum in major program.
Provides clinical supervision of family assessment and consultation skills for practicum based students. Emphasis placed on engagement and problem identification.

ECPY 640 Assessment Methods for Counselors (3)
Prerequisite: ECPY 540.
Study of the individual for counseling purposes. Cover three areas: (a) what constitutes significant data concerning the individual and his/her environment; (b) the procedures followed to obtain these data; and (c) how the counselor may use these data in the counseling process.

ECPY 645 Gender, Sexuality and Sexual Abuse Issues in Therapy (3)
Prerequisite: Consent of instructor.
Gender, sexuality, and sexual abuse issues are presented from the viewpoint of consumers' mental health treatment. Emphasis placed on understanding the contribution of environment and individual experience to current mental health functioning, proper methods of intervention and the process of change. A systems/developmental approach is employed.

ECPY 648 Psychological Assessment I (3)
Prerequisite: ECPY 540.
Note: Cross-listed with EDSP 648.
The first of a two-course sequence, ECPY 648-649, that explores theory and applications of individual psychological assessment. Explores the theory of intelligence, neuro-psychological assessment, abilities measures, the ethical, professional, and legal issues of testing in different settings.

ECPY 649 Psychological Assessment II (3)
Prerequisite: ECPY/EDSP 648.
Note: Cross-listed with EDSP 649.
The second of a course sequence that explores theory and applications of individual psychological assessment. Explores theory and application of tests and social-emotional functioning, development, personality assessment, the ethical, professional, and legal issues of testing in different settings.

ECPY 650 Group Process and Practice (3)
Study of group processes and procedures which are applicable to counseling. Method of instruction is lecture and participation in a group. Pass-Fail grading.

ECPY 651 Group Procedures With Children (3)
Prerequisite: Admission to graduate counselor education or consent of instructor.
Process and practice of group guidance and group counseling with children.

ECPY 660 Introduction to Student Personnel Work (3)
A general introduction to the historical, organizational, administrative, and practical areas of student personnel work in higher education. Bases for these areas will be discussed, with the goals and objectives of student personnel work in view.

ECPY 661 Theories of College Student Development (3)
Examines and explores the major theories of student development. Discussion will be centered on the application of theories to the different types of student groups found on college campuses.

ECPY 662 Student Affairs Programs, Policies, and Practices (3)
Prerequisite: ECPY 660.
Review of functions of student affairs areas in higher education, how they are administered and what is considered good practice in those areas. Includes housing, counseling center, career planning, financial aid, admission, registration, student activities, student unions, student health and other selected areas.

ECPY 663 Multicultural Issues (3)
Emphasis will be placed on developing effective communication skills in multicultural settings. Focus will also be directed toward various psycho-social factors of different cultural and ethnic groups. The influence of these variables on the helping relationship will be explored.

ECPY 664 College Student Sub-Cultures (3)
Prerequisite: ECPY 660.
Overview of various student sub-cultures and professional approaches to development of the students within each culture.

ECPY 670 Career Development and Counseling (3)
A study of career development across the life span. Includes a study of the methods and techniques useful for assisting career and life-style choices. Students will be introduced to current technology available for working with elementary, secondary, and post-secondary students, as well as with adult populations.

ECPY 671 Psychology of Career Development (3)
Prerequisite: ECPY 570/670.
Advanced study of current research and theories of career counseling and career-related assessment.

ECPY 680 Practicum in Counseling (1-8)
Prerequisite: ECPY 521 or 660; ECPY 629, 640, 650, and 570 or 625 (570 or 625 may be taken concurrently).
Student must make application in advance of actual enrollment (by March 1 for Fall term and October 1 for Spring term). Supervised experience in counseling and other activities. Counseling interviews, recorded on audio or videotape, are critically analyzed with emphasis upon the counselor.

ECPY 681 Internship in College Student Personnel Services (3)
The internship in student personnel is designed to provide students with the opportunity to integrate cognitive learning with practical experiences in the area of student personnel services.

ECPY 683 Internship in Counseling Psychology (1-3)
Prerequisite: Two semesters of graduate practicum (ECPY 649 or ECPY 680).
Provides experience in applied counseling psychology under the direct supervision of a licensed psychologist.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

ECPY 684 Internship in School Counseling (3)
Prerequisite: ECPY 680
Provides experience in school counseling under the supervision of a Certified School Counselor. Six hundred hours of service are required and can be achieved either in one semester by serving 40 hours per week in a K-12 school setting or over several semesters by serving at least 300 hours in a school setting and the remaining hours in a setting serving K-12 school-aged children.

ECPY 690 Counselor Supervision (3)
Prerequisite: M.S. in counseling or related field, or consent of instructor for non-majors.
Supervision training from selected supervision models.

ECPY 694 Graduate Seminar in Educational and Counseling Psychology (3)
Prerequisite: Consent of instructor.
Covers current issues in counseling and psychology. Course may be repeated.

ECPY 695 Topical Seminar in Student Personnel Work (3)
Prerequisite: 15 hours in master's or doctoral program.
Examines various topical areas in the field of student affairs in today's university setting. Emphasis on practical experiences with direct supervision by professionals. Primary focus will be the integration of the practical application in conjunction with developmental theory models.

ECPY 696 Independent Study in Guidance (1-3)
By arrangement with dean and advisor.

ECPY 697 Topical Seminar in College Student Personnel Services (3)
Selected topics such as legal problems, housing, and financial aid, determined by student needs and interests.

ECPY 698 Supervised Readings (1-3)
By arrangement with advisor and dean.

ECPY 699 Thesis or Professional Paper (3-6)
Prerequisite: EDFD 600 or equivalent; consent of advisor and dean.

ECPY 705 Adult Development Theories (3)
Prerequisite: Consent of instructor.
A seminar examining physical, psychological, and social changes that occur during adulthood and how those changes affect learning.

ECPY 720 Workshop in Counseling (1-6)
An intensive examination of some specific current or continuing issue or practice in counseling. Review of literature, current field practice, and student participation are stressed.

ECPY 721 Advanced Counseling Seminar (1-8)
Prerequisite: Consent of instructor.
The topic of this seminar will vary from semester to semester. Written notice of the topic will be given prior to its being offered. The topics will be determined by the instructor, and will be of current interest in the field.

ECPY 722 Advanced Theories of Counseling and Psychotherapy (3)
Prerequisite: Master's degree in guidance and counseling or its equivalent and consent of instructor for non-majors.
Covers advanced training in a specific area of counseling and psychotherapy. Topics will be determined by department faculty. Course may be repeated.

ECPY 730 Social, Legal & Ethical Issues in Counseling (3)
Examination of current social developments that relate to counseling. Legal perspectives relevant to practice and principles of ethical practice in counseling.

ECPY 750 Group Counseling, Advanced Theory and Practice (3)
Prerequisite: ECPY 650, master's degree in counseling and consent of instructor for non-majors.
An examination of research theory and relevant literature for application to counseling in groups. Experience and practice are an essential part of the course.

ECPY 761 Program Development & Evaluation in Student Affairs (3)
Prerequisite: Consent of instructor.
Methodologies of developing student affairs programs. Needs assessment through summative evaluations.

ECPY 762 Training of College Student Personnel Paraprofessionals (3)
Prerequisite: ECPY 629, ECPY 650, EDAD 682.
Basic training program for paraprofessionals who work in such traditional settings as residence halls, tutorials, peer advisors & counselors, orientation leaders, other positions where students are providing direct service to other students. Includes experience in a supervised laboratory setting.

ECPY 763 Services for Adult and Commuting Students (3)
Prerequisite: ECPY 661.
Examines the needs of adult and commuting students in post-secondary institutions, how those needs differ from those of residential students and address means of accommodating those needs.

ECPY 775 Biological Bases of Behavior (3)
Prerequisites: ECPY 621 or consent of instructor.
The study of biological bases for behavior including physiological and neurological structure, medical procedures, trauma, psychotropic and illicit and licit drugs.

ECPY 780 Advanced Practicum in Counseling (1-9)
Prerequisite: Master's degree or its equivalent in counseling or student personnel work, including a previous practicum. Consent of instructor for non-majors. Student must make application for this course in advance of actual enrollment (e.g., a student wishing to take practicum during the summer should apply the preceding fall term).
Supervised experience in counseling and/or student personnel work.

ECPY 781 Field Study in Counseling (1-9)
Prerequisite: Admission to post-masters programs.
Field observation or experience.

ECPY 782 Doctoral Internship (3-6)
Prerequisite: Doctoral students in counseling and student personnel or consent of instructor.
Provides on-the-job supervised learning experience for doctoral students in counseling and student personnel. A prospectus describing in concise detail the internship duties must be submitted the semester before the internship begins. May be repeated for up to 12 semester hours of credit.

ECPY 793-794 Doctoral Seminar in Counseling and Student Personnel (3-3)
Prerequisite: Doctoral students in counseling and student personnel or consent of instructor.
Analysis of current issues and research in the field of counseling.

ECPY 795 Doctoral Research (1-15)
Prerequisite: Passing Ed.D. Comprehensive
Note: Cross-listed with EDAD, EDFD, EDSP, EDUC 795.
Examination and admission to candidacy for the doctoral degree.

ECPY 796 Research Literature (1-6)
For advanced graduate students only. Consent of instructor and department chair required.

ECPY 798 Field Study (2)
For Ed.S. candidates only.

ECPY 799 Professional Paper (1-5)
For Ed.S. candidates only.
To provide course credit for the Ed.S. candidate in completing the required independent professional project.

Electrical Engineering (5842-EE)

EE 500 Special Topics in Electrical Engineering (1-6)

EE 505 Graduate-Professional Project in Electrical Engineering (1-6)
Prerequisite: Approval of a faculty sponsor.

EE 510 Computer Design (3)
Prerequisite: Logic Design (EE 210) and assembly language experience as covered by Computer Interfacing (EE/EMCS 412), Introduction to Computer Science and Engineering (EMCS 301), or experience acceptable to instructor.
Corequisite: EE511.
Note: Cross-listed with CSE/EMCS 510.
Review of logic design and elementary computer organization. Design of the central processing unit, memory, control, and input-output portions of a computer. The VHDL hardware design language will be used.

EE 511 Computer Design Laboratory (1)
Prerequisite: Logic Design (EE 210).
Corequisite: EE 510.
Note: Cross-listed with CSE 511.
Experiments in the design of the central processing unit, memory, control, and input-output portions of a computer using VHDL and Mentor Graphics for software simulation.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EE 512 Electronics II (3)
Prerequisites: Electronic Circuits (EE 333) and Electronic Circuits Laboratory I (EE 334).
Corequisite: EE 513.
Design principles of linear discrete and integrated electronic circuits are developed. Topics include comprehensive treatment of op-amp circuits, wideband amplifiers, tuned circuits and oscillators, power amplifiers and IC power supply design. AM/FM modulation and demodulation techniques are covered.

EE 513 Electronics II Laboratory (1)
Prerequisite: Electronic Circuits Laboratory I (EE 334).
Corequisite: EE 512.
Laboratory requirement for EE 512.

EE 514 Introduction to VLSI Systems Laboratory (1)
Prerequisite: Logic Design & Lab (EE 210 & 211).
Corequisite: EE 510/EMCS 510 & EE 515, or consent of instructor.
Design of logic circuits and subsystems using CAD tools: layout, verification, parameter extraction, circuit- and logic-level simulation.

EE 515 Introduction to VLSI Systems (3)
Prerequisite: Logic Design (EE 210).
Corequisite: EE 510/EMCS 510 and EE 514, or consent of instructor.
Note: Cross-listed with CSE 515.
MOS devices and circuits, electrical and logic design principles. Fabrication steps, design rules, electrical parameters, extraction, delays. Logic/switch arrays, dynamic precharge logic, precharge forms, finite state machines, registers, memories, subsystem design examples.

EE 516 Microcomputer Design (4)
Prerequisite: Computer Interfacing (EE/EMCS 412) or consent of instructor.
Note: Cross-listed with EMCS 525.
Design and construction of microcomputers with microprocessors and digital integrated circuits. Breadboarding, hardware design and software design are emphasized. The class is separated into groups and each group designs, breadboards and tests a complete microcomputer system including interfaces to peripheral devices.

EE 518 Fundamentals of Computer Communications and Networks (3)
Prerequisite: Probability and Statistics for Engineers (EMCS 360), and Computer Interfacing (EE 412).
Note: Cross-listed with EMCS 516.
Data communications: The exchange of data between devices is covered. The key aspects of transmission interfacing, link control, and multiplexing are examined. Data communication networking: Examines the internal mechanisms by which communication networks provide a data transfer service for attached devices.

EE 520 Digital Signal Processing (3)
Prerequisite: Signals & Linear Systems (EE 420) and Active Network Design I (EE 421).
Discrete time signals and systems; Discrete Fourier Transforms, FFT algorithms, flow graph and the matrix representation of digital filters; FIR and IIR filter design techniques; quantization effects; spectral estimation; current applications of digital signal processing.

EE 521 Digital Signal Processing Laboratory (1)
Prerequisite: Signals & Linear Systems (EE 420) and Active Network Design I Laboratory (EE 422).
Focuses on the implementation of common digital signal processing functions using state-of-the-art DSP devices and software. Introduction to fundamentals of discrete-time signal processing and digital signal processor architectures and applications. Emphasis on laboratory experience involving generation of deterministic and random signals; digital filter design; quantization effects; FFT computation; linear system analysis; speech processing.

EE 530 Introduction to Random Processes and Estimation Theory (3)
Prerequisites: Linear Algebra for Engineering (EMCS 330), Probability and Statistics for Engineers (EMCS 360), and Signals and Linear Systems (EE420).
Introduction to the theory and applications of random processes, a nonmeasure-theoretic approach to the study of random variables, functions of random variables, least square estimation, convergence, stochastic representation, stationarity, ergodicity, Gaussian processes, Poisson processes, Markov chains, and random fields.

EE 531 Electronic Circuit Design Laboratory (3)
Prerequisite: Electrical engineering majors only.
A laboratory course in which the student designs and constructs a variety of digital and analog circuits. Practical design considerations are emphasized.

EE 533 Integrated Circuit Design (3)
Prerequisite: Electronic Circuits (EE 333) and Active Network Design I (EE 421).
Corequisite: EE 534.
Analysis and design of analog integrated circuits. Bipolar, JFET, and MOS-FET devices. The technology of IC fabrication. Transistor connections, current sources, active loads, and output stages. Integrated amplifier and MOS circuit design.

EE 534 Integrated Circuit Design Laboratory (1)
Prerequisite: Electronic Circuits (EE 333) and Active Network Design I (EE 421).
Corequisite: EE 533.
Laboratory to illustrate design principles in EE 533.

EE 535 Instrumentation Electronics (4)
Prerequisite: Major in mechanical engineering and Introduction to Electrical Engineering (EE 252).
An introduction to analog and digital integrated circuits used in instrumentation systems. Operational amplifiers, timers, counters, shift registers, memories, and analog-to-digital converters are discussed. Microprocessors are introduced and their uses in data acquisition and control systems are described. Weekly laboratory.

EE 538 Electronic Devices and Circuits (3)
Prerequisite: Consent of instructor.
Note: Restricted to high school teachers of physics, chemistry, and general science teachers. The course will deal with the fundamentals of electronic devices and their practical circuit applications. Integration of lecture with laboratory experiments is emphasized.

EE 539 Digital Logic and Computer Organization (3)
Prerequisite: Consent of instructor.
The course is designed to prepare high school science teachers to offer a course in digital theory and experimental digital practice. Laboratory experiments are integrated with classroom lectures.

EE 540 Lasers and Electrooptical Systems (3)
Prerequisite: Numerical Methods for Engineering (EMCS 307), Linear Algebra for Engineering (EMCS 330), and EE 569; or consent of instructor.
Corequisite: EE 541.
Review of basic electro-magnetics, ABCD law; higher order Gaussian beam modes. Optical resonators: interaction of radiation and atomic systems. Laser oscillation: three and four level systems. Non-linear optics: second-harmonic generation, parametric oscillation and electrooptic modulation, laser applications in information processing, computers and communications.

EE 541 Engineering Optics Laboratory (1)
Prerequisite: Numerical Methods for Engineering (EMCS 307), Linear Algebra for Engineering (EMCS 330), and EE 569; or consent of instructor.
Corequisite: EE 540 or 545.
Computer-aided design-oriented series of fundamental optics experiments ranging from thin lens experiments, diffraction, interference, laser coherence and birefringence. Abbe theory.

EE 542 Physical Electronics (3)
Prerequisite: Introductory Modern Physics (PHYS 300).
Semiconductor fundamentals, energy bands, carrier transport theory, continuity equations, PN junction diodes, Zener diodes, Schottky Barrier diodes, metal-semiconductor contacts, bipolar junction transistors, MOS capicators, field effect transistors, microelectronic fabrication.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EE 545 Optical Signal Processing (3)
Prerequisite: Signals & Linear Systems (EE 420); or consent of instructor.
Scalar diffraction theory and equivalence to linear filtering. Fourier transform properties of lenses. The modulation transfer function.

EE 550 Communications and Modulation (3)
Prerequisite: Signals & Linear Systems (EE 420).
Corequisite: EE 551
Modulations such as AM, FM, PAM, PPM, PDM, single sideband, vestigial sideband. Coherent and noncoherent detections, heterodyne action, performance and distortions, circuits for modulating and demodulating.

EE 551 Communication Systems Laboratory (1)
Prerequisite: Signals & Linear Systems (EE 420).
Corequisite: EE 550.
Laboratory exercises involving the design and analysis of electronic communication systems for the transmission of analog and digital data at radio frequencies.

EE 560 Control Systems Principles (3)
Prerequisite: Signals & Linear Systems (EE 420).
Corequisite: EE 561.
Basic concepts of linear control systems. Formulation of the linear control problem by classical and state space methods. Frequency response and time response analysis and synthesis techniques. Stability and system performance specifications.

EE 561 Control Systems Laboratory (1)
Corequisite: EE 560.
Laboratory exercises involving identification, analysis and design of closed-loop control systems.

EE 569 Intermediate Electromagnetic Fields and Waves (3)
Prerequisite: Introduction to Electromagnetic Fields and Waves (EE 473).
General curvilinear coordinates. Electromagnetic energy transmission. The wave equation, Poynting theorem and plane wave propagation in media. Transmission lines and impedance matching.

EE 570 Microwave Engineering (3)
Prerequisite or Corequisite: EE 569 and EE 572.
Microwave generation, transmission, and detection. Unified approach to analysis of wave guiding systems. Design of microwave components, devices, and systems to realistic specifications. Hardware to be discussed includes passive components, ferrite components, resonators and filters, klystrons, magnetrons, traveling-wave tubes, microwave diodes, microwave transistors, and microwave integrated circuits.

EE 571 Antennas (3)
Prerequisite or Corequisite: EE 569.
Introduction to antenna radiation and reception. Radiating systems discussed include wire, aperture, reflector, lens, traveling-wave, log-periodic antennas, uniform and random-phased arrays, adaptive multibeam arrays, conformal arrays, and millimeter wave antennas. Introduction to antenna measurements, including impedance and radiation patterns. Introduction to numerical analysis of realistic radiating and scattering systems.

EE 572 Microwave Engineering Laboratory (1)
Prerequisite or Corequisite: EE 569, EE 570, or consent of instructor.
Experiments at microwave frequencies dealing with Time Domain Reflectometer (TDR) techniques, mismatch loss and maximum power transfer; impedance, power pattern and polarization measurements of several basic antenna types; characteristics of wave propagation at normal incidence and oblique reflection.

EE 581 Electromechanics (3)
Prerequisite: Introduction to Electromagnetic Fields and Waves (EE 473).
B and H in ferromagnetic materials. Magnetic circuits. Transformers. Dynamic equations of magnetic systems. Operating principles and characteristics of d.c. motors and generators, universal motors, induction motors, synchronous motors.

EE 582 Power System Analysis (3)
Prerequisite: Introduction to Electromagnetic Fields and Waves (EE 473).
Three-phase circuits. Inductance and capacitance of transmission lines. Circuit models. Per-unit representation. Network methods. Load-flow studies. Load-flow control. Economic dispatch. Symmetrical three-phase faults.

EE 593 Independent Study in Electrical Engineering (1-6)
Prerequisite: Approval of a faculty sponsor.

EE 595 Graduate-Professional Seminar in Electrical Engineering (1)

EE 600 Special Topics in Electrical Engineering (1-6)

EE 605 Graduate Project in Electrical Engineering (1-6)
Prerequisite: Approval of a faculty sponsor.

EE 610 Advanced Logic Design (3)
Prerequisite: Logic Design (EE/EMCS 210).
Note: Cross-listed with CSE/EMCS 610.
Models and elementary properties of sequential machines, sequential machine compatibility and equivalence, state assignment and state minimization.

EE 611 Computer Architecture (3)
Prerequisite: EE 510/EMCS 510.
Note: Cross-listed with CSE/EMCS 611.
Classification of computer designs. PMS and ISP descriptions. Study of major systems of current and historical interest.

EE 614 Artificial Neural Systems (3)
Foundations of learning machines and neural processing algorithms: supervised and unsupervised learning of feedforward and recurrent neural networks, perceptron layers, associative memories, feature maps. Applications in the areas of classification, control, and signal processing. Implementation issues.

EE 616 VLSI Architectures (3)
Prerequisites: EE 510, 515 or consent of instructor
Design of datapaths and processor arrays, testability, analog architectures. VLSI design project: design, implementation and fabrication.

EE 617 Expert Systems Engineering (3)
Knowledge representation, production and decision support systems. Electrical engineering design project using LISP, PROLOG or expert systems shell.

EE 618 Digital Image Processing (3)
Prerequisite: EE 520 and EE 521 or Signals and Linear Systems (EE 420) and consent of instructor.
Note: Cross-listed with EMCS 627.
Introduction to the theory and applications of 2-D signal and image processing, 2-D signals and systems analysis, 2-D sampling and quantization, 2-D signals and image transforms, 2-D FIR filter design, image formation, image enhancement, image restoration, image coding, image reconstruction from projections, image compression, color image processing, current applications.

EE 619 Computer Vision (3)
Prerequisite: EE 618
Introduction to the theory and applications of computer vision. Topics include: image representation, image segmentation, image analysis by mathematical morphology, texture, shape representation, shape analysis, stereo vision, and 3D vision.

EE 620 Pattern Recognition and Machine Intelligence (3)
Prerequisite: Signals & Linear Systems (EE 420), EE 650 or Probability and Statistics for Engineers (EMCS 360) and consent of instructor.
Pattern recognition and machine intelligence; fundamentals of statistical, structural, and syntactic pattern recognition approaches. Parametric and nonparametric classification, feature extraction, clustering, and formal languages representation. Applications include: data classification, character recognition, speech recognition, and target tracking.

EE 621 Active Network Design II (3)
Prerequisite: Active Network Design I (EE 421).
Corequisite: EE 622.
A continuation of EE 421. Filter, approximations and transformations, all-pass networks, phase equalization, composite op-amps, and time-domain properties of filters are among the topics considered. The course includes readings from the literature.

EE 622 Active Network Design II Laboratory (1)
Prerequisite: Active Network Design I Laboratory (EE 422).
Corequisite: EE 621.
Laboratory to illustrate analysis and design principles.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EE 625 State Space Theory of Linear Systems (3)
Prerequisite: Signals & Linear Systems (EE 420).
Modern theory of linear systems with primary emphasis on the state-space formulation. Single-input single-output, multiple-input multiple-output, continuous, discrete, time-invariant, and time-varying systems are considered. Concepts of controllability, observability, canonical forms, state transition matrices, eigenvalues, eigenvectors, stability, and state observation.

EE 630 Pulse and Digital Waveforms (3)
Prerequisite: Active Network Design I (EE 421), or consent of instructor.
Corequisite: EE 631.
Note: Cross-listed with CSE 632.
Analysis and design of clippers, clampers, Schmitt triggers, precision rectifiers, peak detectors, monostables, astables, function generators, sine shapers, track-and-hold circuits, digital-to-analog and analog-to-digital converters, and current-mode circuits are among the topics discussed. The course emphasizes piecewise-linear analysis.

EE 631 Pulse and Digital Laboratory (1)
Prerequisite: Active Network Design I Lab (EE 422) or consent of instructor.
Corequisite: EE 630.
Laboratory to illustrate analysis and design principles.

EE 640 Introduction to Biomedical Engineering (3)
Prerequisite: Signals & Linear Systems (EE 420).
Engineering modeling and simulation of biological systems, quantitative physiology of the cardiovascular, pulmonary, and circulation systems, fundamentals of biomechanics and human-machine interface, basics of medical instrumentation design, and artificial organs. Practical applications include biopotential amplifiers design, biological signal processing, and medical imaging.

EE 642 Fiber Optics and Integrated Optical Systems (3)
Prerequisite: Numerical Methods for Engineering (EMCS 307), Linear Algebra for Engineering (EMCS 330), and EE 569; or consent of instructor.
Propagation of electromagnetic waves in dielectric media. Phase and group velocity: Eikonal equation. Ray and wave theory of uniform and graded index planar and channel optical waveguides and optical fibers. Design and fabrication techniques for waveguides and integrated optical devices. Semiconductor laser and modulator design.

EE 646 Optical Computer Architectures (3)
Prerequisite: Consent of instructor
Focuses on the assessment of optoelectronic technology to enhance the performance of future computers. General consideration is given to the feasibility of all-optical supercomputers in the future and how electro-optical technology can support nearer term computing needs. Current research avenues and specific implementations of computing components are studied in detail.

EE 647 Fundamentals of Optoelectronics and Photonics (3)
Prerequisite: Consent of instructor
Introduction to fundamental properties, components, and theories used to build optical systems for broad bandwidth telecommunications, computing, sensing and information processing.

EE 650 Statistical Theory of Communication (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360) and EE 550.
Analysis and design of linear and nonlinear systems of engineering interest that are forced by random noise and/or noise-like signals. Random processes, correlation functions, spectral density, optimum linear systems. Applications in control systems engineering and radio communications engineering, including radar, sonar, signal design, and weak signal detection in the presence of noise.

EE 651 Communication System Design (3)
Prerequisite: EE 550.
Emphasis on the systems approach to digital communication systems design. Topics include communication link analysis, channel coding, modulation and coding trade-offs, synchronization, spread spectrum techniques, and data encryption and decryption.

EE 652 Information Theory and Coding (3)
Prerequisite: EE 550.
Information theory, capacity, and measures of information; fixed and variable length block encoding, data compression; state transition and Markov source models for communication channels and methods of achieving maximum capacity; topics in abstract algebra including groups, rings and fields; block error correction codes such as Hamming codes, cyclic codes, BCH codes, Reed Soloman codes; convolutional codes and Viterbi decoding algorithm.

EE 661 Sampled-Data Control Systems (3)
Prerequisite: EE 560.
Note: Cross-listed with CHE 664.
Analysis and synthesis of closed-loop sampled-data control systems using Z-transform calculus and state space methods. Digital controllers, multirate sampling, quantization, and other advanced control topics.

EE 662 Introduction to Optimum Control (3)
Prerequisite: EE 560.
Calculus of variations, dynamic programming, the minimum principle, and numerical optimization techniques applied to discrete-time and continuous-time deterministic control systems.

EE 663 Control Systems Design (3)
Prerequisite: EE 560.
Continuation of EE 560, with emphasis on practical methods for the design and compensation of feedback control systems. Classical methods, using frequency domain and root locus techniques, are covered as well as state variable design procedures. System identification and linearization are discussed, and computer-aided design is stressed.

EE 664 Modern Adaptive Control (3)
Prerequisite: EE 560 & 625.
Methods of modern adaptive control, including the indirect and direct approaches. Discrete- and continuous-time controllers. Behavior of controllers under nonideal conditions, including stochastic disturbances and unmodeled dynamics.

EE 665 Theory of Nonlinear Systems (3)
Prerequisite: EE 625.
Modern theory of nonlinear systems including phase plane analysis, Lyapunov stability theory, perturbation theory, singular perturbations, describing functions, Lure problem, Popov circle criterion. Applications to closed-loop control systems.

EE 667 Fuzzy Control (3)
Prerequisites: EE 560 and EE 561.
Fuzzy system basics including fuzzy set theory, fuzzification, inference, defuzzification. Programming fuzzy systems. Fuzzy control approaches. Fuzzy systems identification and rule base construction from data. Adaptive fuzzy control using both direct and indirect approaches.

EE 670 Advanced Electromagnetic Theory (3)
Prerequisite: EE 569.
General curvilinear coordinates. Applications of Maxwell's equations. Boundary conditions. Uniform and nonuniform transmission lines. Scalar and vector potentials. Dielectric and magnetic properties of matter. Complete and partial wave polarization. Interaction of waves and matter. Reflection and refraction of waves at boundaries. Wave propagation in anisotropic media. Energy and momentum of electromagnetic waves.

EE 672 Theory of Microwave Components and Circuits (3)
Prerequisite: EE 570.
Plane, cylindrical, and spherical wave functions. Modes of propagation. Wave impedance. Circuit theory of one and multiport networks. Impedance and scattering concepts. Symmetrical devices. Microwave cavities. Directional devices. Nonreciprocal devices. Periodically loaded lines. Ferrites and other microwave materials.

EE 681 Solid-State Motor Controls (3)
Prerequisite or corequisite: EE 581.
Electrical and mechanical input-output characteristics of various d.c. and a.c. motors as related to mechanical control by electrical inputs. Applications of solid-state devices (SCR's, SCS's, Triacs, etc.) in trigger, control, and protective circuits for motors.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EE 682 Advanced Power System Analysis (3)
Prerequisite: EE 582.
Symmetrical components. Unsymmetrical faults. Power system stability. Power system protection. Computer methods.

EE 690 M.S. Thesis in Electrical Engineering (1-6)
Experimental and/or theoretical research to be presented in thesis for degree requirement.

EE 693 Independent Study in Electrical Engineering (1-6)
Prerequisite: Approval of a faculty sponsor.

EE 695 Graduate Seminar in Electrical Engineering (1-6)
Prerequisite: Approval of a faculty sponsor.

Engineering Management (5854-EM)

EM 510 Industrial Accounting (3)
Prerequisite: Graduate/ Professional or Graduate School standing.
Fundamentals of financial accounting, accounting systems, cost accounting, and budgetary control systems.

EM 515 Operations Research I: Deterministic Models (3)
Prerequisite: Matrix Methods for Algebraic and Differential Equations (EMCS 205) or equivalent.
The application of mathematical modeling and network analysis techniques to resolve engineering and management problems. The deterministic models include: linear, integer, dynamic, and nonlinear programming; network analysis; scheduling; and PERT.

EM 560 Construction Management (3)
Prerequisite: Graduate/ Professional or Graduate School standing.
An investigation of the engineer's role in the construction process. Study of the many variables influencing the project and associated methods of managing variables. Includes a practical demonstration of student's understanding schedule and cost estimate for a project of the student's choosing.

EM 570 Engineering Economic Analysis (3)
Prerequisite: Graduate/ Professional or Graduate School standing.
The economic evaluation of engineering proposals involving the investment of capital in machines, processes, structures, and other systems, including the economic justification of highly automated manufacturing systems. The frequent trade-offs between engineering design efficiency and economic efficiency are stressed by a required term project.

EM 590 Special Topics in Engineering Management (1-6)
Prerequisite: Graduate/ Professional or Graduate School standing.
A theoretical or experimental investigation of an engineering management problem.

EM 611 Analysis of Organizational Structures (3)
Prerequisite: Graduate/ Professional or Graduate School standing.
The theories and practices of design and analysis of engineering organizations. Topics include the analysis of an engineering organization, its structure, control measures, industrial enterprise, organizational change, and productivity assessments.

EM 640 Applied Systems Analysis (3)
Prerequisite: Engineering Statistics for Industrial Engineers (IE 360) or Probability and Statistics for Engineers (EMCS 360) or equivalent.
Methods of engineering management applied to case studies so as to define the problems, analyze the data, and recommend solutions or decisions.

EM 646 Marketing and the Engineer (3)
Prerequisite: EM 570.
Provides an introduction to marketing principles and techniques with an emphasis on technical product development, pricing, promotion and distribution strategies. It stresses the role the engineers play in the product marketing plan of an organization, as well as methods for forecasting technology and measuring marketing decisions. It includes a unit on marketing aspects of engineering entrepreneurship.

EM 660 Management Information and Control Systems (3)
Prerequisite: A working knowledge of at least one computer programming language.
A study of systems designed to meet the information needs of engineering managers at all levels. A detailed investigation of the system analysis and design process, with emphasis on computer aided information and control systems.

EM 670 Input-Output Analysis (3)
Prerequisite: EM 515.
A study of the basic ideas of input-output analysis, with emphasis on its application to economic and technological forecasting.

EM 672 Management Law for Engineers (3)
Prerequisite: Graduate/ Professional or Graduate School standing.
Elements of law particularly applicable to engineering functions in an organization. Includes contracts, tort law, including negligence, product liability, strict liability, and damages. Workmen's compensation, wage and hour laws, unemployment insurance, OSHA, HEW, equal opportunity, and affirmative action; patents, copyrights, and trademarks; forms of business organizations; property and personal rights.

EM 675 Time Series Analysis (3)
Prerequisite: Engineering statistics for Industrial Engineers (IE 360) or Probability & Statistics for Engineers (EMCS 360).
Z-transforms; linear, time-invariant, casual systems; signals; autocorrelation; power density spectrum; decimation; adaptive analysis; Box-Jenkins analysis; state-space analysis; comparison of analytical methods.

EM 682 Engineered Personnel Subsystems (3)
Prerequisite: Graduate/ Professional or Graduate School standing.
Human factors engineering evaluation of personnel subsystems: selection, training, and evaluation processes. Human behavior in industrial organizations. Job performance evaluation and testing procedures. Planning and control of personnel subsystems. Behavioral analysis and measurement methods.

EM 683 Project Management (3)
Prerequisite: Graduate/ Professional or Graduate School standing.
Use of CPM, PERT, precedence diagramming, resource allocation heuristics, and other techniques for planning, managing, and controlling engineering projects involving research and development, production, maintenance, and construction. Computer procedures and codes for analyzing complex project networks will be covered.

EM 690 M.Eng Thesis in Engineering Management (1-8)
A candidate for the Master of Engineering degree, specializing in the field of engineering management, is required to perform a study, design, or investigation under the direction of a faculty member. A written thesis is required to be presented orally and submitted to the faculty for approval.

EM 693 Independent Study in Engineering Management (1-6)

EM 694 Special Topics in Engineering Management (1-6)
A theoretical or experimental investigation of an engineering management problem.

EM 695 Engineering Management Seminar (1-6)

EM 697 M.S. Thesis in Engineering Management (1-6)

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Engineering Mathematics and Computer Science (5857-EMCS)

EMCS 501 Combinations and Graph Theory (3)
An introduction to set theory, graph theory, and combinatorial analysis. Includes set algebra, order relations, cardinality, undirected and directed graphs, elementary combinatorics, principle of inclusion and exclusion, recurrence relations, zero-one matrices, partitions and Polya's theorem. Applications to computer science and other disciplines.

EMCS 504 Automata Theory (3)
Prerequisite: Discrete Structures (EMCS 310).
Note: Cross-listed with CSE 504.
Finite state machines and their application to engineering problems including modeling the behavior of discrete systems. Topics include theory of computing, formal language theory, and applications of cellular automata. Engineering models of digital computer hardware are covered and related to software design.

EMCS 506 Modeling and Analysis of Engineering Systems (3)
Prerequisite: Linear Algebra for Engineering (EMCS 330)
Representation of engineering systems, Fourier analysis, z-transforms, frequency response, state-space analysis, stability, an introduction to the basic theory of filter design; and demonstrated concepts to CAS.

EMCS 508 Numerical Analysis I (3)
Prerequisite: Engineering Computation (EMCS 207) and Elementary Linear Algebra Methods in Engineering (EMCS 325).
Advanced numerical methods for computer aided engineering analysis and design. Functional approximation; splines; boundary value problems; Fourier approximations and transforms; FFT; matrix decompositions and eigenvalues; characteristic value problems.

EMCS 509 Numerical Analysis II (3)
Prerequisite: EMCS 508.
Advanced numerical methods for computer aided engineering analysis and design. Functional approximation; splines; boundary value problems; Fourier approximations and transforms; FFT; matrix decompositions and eigenvalues; characteristic value problems.

EMCS 510 Computer Design (3)
Prerequisite: Logic Design (EE 210) and assembly language experience as covered by Computer Interfacing (EE/EMCS 412), Introduction to Computer Science and Engineering, EMCS 301, or experience acceptable to the instructor.
Corequisite: EE 511.
Note: Cross-listed with CSE/EE 510.
Review of logic design and elementary computer organization. Design of the central processing unit, memory, control, and input-output portions of a computer. The VHDL hardware design language will be used.

EMCS 511 Complex Analysis for Engineers (3)
Prerequisite: Differential Equations for Engineers (EMCS 202).
Analysis and design of engineering systems using complex numbers, functions of complex variables, complex calculus, Nyquist stability criterion, engineering applications of line integrals, and power series.

EMCS 516 Fundamentals of Computer Communications and Networks (3)
Prerequisite: Probability and Statistics for Engineers (EMCS 360), and Computer Interfacing (EE 412).
Note: Cross-listed with EE 518.
Data communications: The exchange of data between devices is covered. The key aspects of transmission interfacing, link control, and multiplexing are examined. Data communication networking: Examines the internal mechanisms by which communication networks provide a data transfer service for attached devices.

EMCS 518 Applied Mathematics in Engineering (4)
Application of mathematical techniques, such as differential equations, transforms, series, and numerical solutions to problems in engineering analysis and design. Study of the techniques involved in mathematical modeling of engineering systems.

EMCS 522 Performance Evaluation of Computer Systems (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360) and Design of Operating Systems (EMCS 420).
A study of approaches to the evaluation of computer systems. Measurement techniques and evaluation techniques are treated in detail with attention to existing commercial hardware and software monitors and simulators.

EMCS 525 Microcomputer Design (4)
Prerequisite: Computer Interfacing (EE/EMCS 412) or consent of instructor.
Note: Cross-listed with EE 516.
Design and construction of microcomputers with microprocessors and digital integrated circuits. Breadboarding, hardware design, and software design are emphasized. The class is separated into groups, and each group designs, breadboards, and tests a complete microcomputer system, including interfaces to peripheral devices.

EMCS 530 Design of Compilers (3)
Prerequisite: Design of Operating Systems (EMCS 420) and EMCS 504.
Note: Cross-listed with CSE 530.
Engineering descriptions of algorithmic language. Study of syntax, semantics, ambiguities, procedures, replication, iterations, and recursion in the language. Engineering design of a compiler.

EMCS 542 Computer Control and Real Time Programming (3)
Prerequisite: Active and Passive Networks (EE 252), Differential Equations for Engineers (EMCS 202) and consent of instructor.
Discrete control; elementary relays; some of the commonly used input/output, including computer hardware modules, solid state linear and non-linear amplifiers, and final control elements; and real time programming applications using programmable controllers and micro-computers. The design and implementation of student projects is required.

EMCS 545 Artificial Intelligence (3)
Prerequisite: Design of File Structures (EMCS 335) and Use of Selected Programming Languages: LISP (EMCS 303).
Note: Cross-listed with CSE 545.
Topics covered will include rationale and use of heuristic approach to engineering problem solving; information processing models as an explanation of human perceptual, cognitive and affective behaviors. Applications involving the concepts and problems in artificial intelligence engineering.

EMCS 546 Knowledge Engineering and Expert Systems (3)
Prerequisite: EMCS 545 or consent of instructor.
Encapsulation and integration of machine and human knowledge engineering, design theories and methods of large scale knowledge processing, design of inference engine and expert system shells. Correctness and quality assurance of expert systems.

EMCS 550 Software Engineering (3)
Prerequisite: Design of Operating Systems (EMCS 420) and Object Oriented Design (EMCS 440) or consent of instructor.
Note: Cross-listed with CSE 550.
Engineering methods applied to the life-cycle issues in the team-oriented development of large software systems including issues of software processes, metrics, testing and quality. Documentation of the project and an oral presentation are required.

EMCS 563 Experimental Design in Engineering (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360).
Note: Cross-listed with IE 563.
Design of engineering experiments and projects using theory of least squares, analysis of variance and covariance, randomized blocks, Latin squares, factorial experiments and associated topics. Engineering design problems using SAS or equivalent software packages.

EMCS 565 Linear Statistical Models in Engineering (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360).
Engineering applications of the general linear statistical model using basic regression analysis, inference in regression, indicator variables, ANOVA models. Engineering design problems utilizing computer programs and software packages.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EMCS 570 Computer Speech Processing (3)
Prerequisite: EMCS 400 or EMCS 508 or consent of instructor.
Provides a detailed treatment of the theory and applications of computer digital speech processing and includes the following topics: fundamentals of speech signals, speech processing and coding, digital speech transmission, speech synthesis, speech recognition and verification.

EMCS 575 Modern Control Theory for Engineering Systems (3)
Prerequisite: Differential Equations for Engineers (EMCS 202) and Elementary Linear Algebra Methods in Engineering (EMCS 325).
Analysis and control of engineering systems based on Z-transforms, eigenvalue-eigenvector problems, state and space concepts, controllability, considered with observability and stability. Multivariable systems will be considered with emphasis on simulation concepts and engineering applications.

EMCS 593 Independent Study in Engineering Mathematics And Computer Science (1-6)

EMCS 608 Advanced Design of Operating Systems (3)
Prerequisite: Design of operating Systems (EMCS 420)
Note: Cross-listed with CSE 608
Formal study of algorithms arising in the engineering design of operating systems. Models will be designed and analyzed as to performance measures and optimality. Topics include management protection, security, concurrency, and resource allocation.

EMCS 609 Hypertext and Multimedia Processing (3)
Prerequisite: Design of File Structures (EMCS 335), or consent of instructor.
Design-related studies of Hypertext processing and design. Multimedia document representation, storage, and communication. Integration of audio, video, and textual sources for multimedia instruction, and computer-based interpersonal communication. Software and hardware issues for virtual reality environments. Case studies in engineering issues for delivery in medicine and the arts.

EMCS 610 Advanced Logic Design (3)
Prerequisite: EMCS 510.
Note: Cross-listed with CSE/EE 610.
Models and elementary properties of sequential machines, sequential machine compatability and equivalence, state assignment and state minimization.

EMCS 611 Computer Architecture (3)
Prerequisite: EMCS 510.
Note: Cross-listed with CSE/EE 611.
Classification of computer designs. PMS and ISP descriptions. Study of major systems of current and historical interest.

EMCS 615 Linear and Nonlinear Programming (3)
Prerequisite: Engineering Computations (EMCS 207) and Elementary Linear Algebra Methods in Engineering (EMCS 325).
Survey of methods for linear and nonlinear optimization in engineering. Characterization of an optimal solution; selected methods and industrial applications. A written engineering project report is required.

EMCS 616 Communication and Network Architectures (3)
Prerequisite: EMCS 612.
Explores both the architectural principles and the specific mechanisms required for the exchange of data among computers, terminals and other data processing devices. It also introduces the ISDN and other advanced architectures, which are emerging worldwide digital telecommunications facilities.

EMCS 617 Advanced Engineering Analysis I (3)
Prerequisite: Differential Equations for Engineers (EMCS 202).
Special functions used in engineering application, such as Bessel functions and Legendre polynomials, engineering application of Fourier series, Fourier transform, fast Fourier transform, Laplace transforms, the heat wave, and Maxwell's equations, and their use in engineering. A written project report is required.

EMCS 618 Advanced Engineering Analysis II (3)
Prerequisite: EMCS 617.
Special functions used in engineering application, such as Bessel functions and Legendre polynomials, engineering application of Fourier series, Fourier transform, fast Fourier transform, Laplace transforms, the heat wave, and Maxwell's equations, and their use in engineering. A written project report is required.

EMCS 619 Design and Analysis of Computer Algorithms (3)
Prerequisite: Design of File Structures (EMCS 335) and Discrete Structures (EMCS 410).
Note: Cross-listed with CSE 619.
The engineering design of efficient computer algorithms. A study of the inter-relationships between algorithmic statements, data structures, and the resulting computational complexity of the algorithm. An engineering analysis of the effect of the computer implementation of the algorithmic statement on the computational complexity. Categorization of algorithms into complexity classes.

EMCS 621 Simulation of Continuous Systems (3)
Prerequisite: Continuous Simulation in Engineering (EMCS 411).
Analog and digital computer simulations of systems described by ordinary differential equations. Informal analog computer laboratory. Digital simulations using FORTRAN and continuous systems simulation languages. Organization of a simulation processor.

EMCS 622 Simulation and Modeling of Discrete Systems (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360).
Engineering design of simulation languages and simulators, discrete stochastic systems, issues in large scale simulation studies and engineering evaluation methods.

EMCS 624 Advanced Simulation (3)
Prerequisite: EMCS 622.
Selected advanced topics in computer and software architectures, algorithms and models in simulation.

EMCS 625 Advanced Compiler Theory (3)
Prerequisite: EMCS 530.
Advanced topics involving the design of computers. Emphasis is placed on techniques and formal systems which have been developed to automate the process of compiler construction, given a suitable representation of the source language.

EMCS 627 Digital Image Processing (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360) or Signals & Linear Systems (EE 420) or consent of instructor.
A course that surveys basic concepts in image processing and pattern recognition. Topics included are: contrast and edge enhancement, histogram modification, image segmentation, feature extraction, statistical classifiers. Design problems involving computer implementation of algorithms are used extensively.

EMCS 628 Computer Graphics (3)
Prerequisite: Elementary Linear Algebra Methods in Engineering (EMCS 335).
Introduction to computer graphics hardware and interactive engineering computer graphics techniques. Topics include engineering computer aided design, graphics hardware (display processors and displays, hardcopy output devices, input devices), graphics standards and graphical kernel system, graphic object representation and transformation, interaction techniques, three-dimensional graphics. Hardware graphics options are discussed and used.

EMCS 629 Distributed System Design (3)
Prerequisite: Design of Operating Systems (EMCS 420) and EMCS 619.
Software issues involved in designing distributed systems, resource allocation, load balancing, synchronization of processes, reliability evaluation of distributed systems, with emphasis on current research topics.

EMCS 630 Data Base Design (3)
Note: Cross-listed with CSE 630.
Advanced engineering oriented design for information storage and retrieval. The emphasis will be placed on engineering design and implementation of relational hierarchical and network data base systems. A written project report is required.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EMCS 633 Computer Vision (3)
Prerequisite: EMCS 627, or EE 618, or consent of instructor.
Note: Cross-listed with EE 619.
Review of elementary pattern recognition and image processing; extension to advanced topics in computer vision, such as three-dimensional vision and perception, syntactic pattern recognition, motion, texture, and color vision applications.

EMCS 642 Engineering Methods in Fuzzy Information Processing (3)
Prerequisites: Logic Design (EMCS 210), Engineering Probability & Statistics (EMCS 360), Discrete Structures (EMCS 410).
Engineering knowledge representations and computer manipulation of fuzziness and uncertainty in software systems and in sensing systems, artificial intelligence, engineering expert systems, robotics and computer vision through applications of fuzzy algorithms, non-monotone logic, fuzzy data base in computer-human interaction design.

EMCS 645 Advanced Artificial Intelligence (3)
Prerequisite: EMCS 545.
Advanced topics in artificial intelligence from current research publications. Oriented toward second year graduate students. Major project required.

EMCS 650 Advanced Software Engineering (3)
Prerequisite: EMCS 550.
Selected formal methods, algorithms and models applicable in the software engineering process life-cycle.

EMCS 651 Optimization of Dynamic Systems (3)
Prerequisite: Engineering Computation (EMCS 207) and Elementary Linear Algebra Methods in Engineering (EMCS 325).
Optimization of time-dependent systems. Dynamic programming, mathematical techniques for identification and control of continuous and discrete systems.

EMCS 661 Stochastic Processes (3)
Prerequisite: EMCS 660 or consent of instructor.
A study of the stochastic nature of engineering systems using Poisson, normal, stationary, renewal, and Markov processes. An engineering project report is required.

EMCS 663 Advanced Experimental Design in Engineering (3)
Prerequisite: EMCS 563.
Engineering applications of the advanced theory of least squares, multiple regression, ANOVA, random blocks,
Latin squares, factorial experiments, partial confounding, and other experimental designs utilized in engineering. An engineering project report is required.

EMCS 664 Sampling Theory for Finite Populations (3)
Prerequisite: EMCS 662.
Simple random sampling, sampling for proportions and percentages, estimation of sample size, stratified random sampling, ratio estimates, regression estimates, systematic sampling.

EMCS 690 M.S. Thesis in Computer Science (1-6)
Experimental and/or theoretical research to be presented in thesis.

EMCS 693 Independent Study in Engineering Mathematics And Computer Science (1-6)

EMCS 694 Special Topics in Engineering Mathematics And Computer Science (1-6)
Devoted to topics which usually are not treated in detail in the general course.

EMCS 695 Engineering Mathematics And Computer Science Seminar (1)

English (0321-ENGL)

ENGL 503 Advanced Creative Writing I (3)
Prerequisite: Intermediate Creative Writing Workshop (ENGL 305) and consent of instructor.
A course designed for students who have had considerable experience in imaginative writing, and who wish to increase their aptitude as writers of drama, fiction, or poetry. Fall.

ENGL 504 Advanced Creative Writing II (3)
Prerequisite: ENGL 503 and consent of instructor.
A continuation of 503, but individuals concentrate on a given form. Spring.

ENGL 505 Advanced Technical Writing (3)
Prerequisite: Technical Writing (ENGL 303), or writing sample with instructor's consent.
Topic definition, audience analysis and editing strategies for technical reports, theses and articles in various disciplines.

ENGL 506 WR Teaching of Writing (3)
Prerequisite: Advanced Composition (ENGL 309) or Writing About Literature (ENGL 310), or consent of instructor.
Introduction to the theory, research, and practice that informs the effective teaching of writing.

ENGL 515 Introduction to Old English (3)
Readings in the original language of Old English prose and poetry.

ENGL 518 Foundations of Language (3)
Note: Cross-listed with LING 518.
A survey of contemporary theories of language, from structuralism to transformational grammar; the relationship of linguistics to literature, psychology, philosophy, reading, and sociology.

ENGL 522 Structure of Modern American English (3)
An examination of the structure of American English; emphasis on grammatical terminology and systems of classification. Recommended for prospective English teachers.

ENGL 523 History of the English Language (3)
The evolution of modern English in terms of social, historical, and linguistic forces which molded it; emphasis on Anglo-Saxon metrics, Latin, French, and Danish influences, and cosmopolitan aspects of English.

ENGL 530 The Teaching of English as a Second Language (3)
Note: Cross-listed with FLE 524.
A theoretical and practical approach to teaching English to students whose native language is not English. The linguistic bases of English will be considered, as well as the application of curriculum principles.

ENGL 535 Applied Linguistics for English Teachers (3)
Prerequisite: Intermediate College Writing (ENGL 102) or Advanced Composition for Freshmen (ENGL 105).
Note: Cross-listed with LING 535.
Applied linguistics and its application to an understanding of speaking, listening, reading, and writing processes.

ENGL 541 Studies in Old and Middle English Literature (3)
Prerequisite: Intermediate College Writing (ENGL 102) or Advanced Composition for Freshmen (ENGL 105).
In-depth study of selected movements, genres, topics, or groupings of writers from the Old and/or Middle English periods.

ENGL 542 Studies in Tudor and Elizabethan Literature (3)
Selected writers and topics of the sixteenth century.

ENGL 543 Stuart and Commonwealth Literature (3)
Selected writers and topics of the seventeenth century.

ENGL 544 Restoration and Eighteenth-Century English Literature (3)
Selected writers and topics of the period from 1660 to 1800.

ENGL 545 English Literature of the Romantic Period (3)
Selected writers and topics in the literature of English Romanticism.

ENGL 546 English Literature of the Victorian Period (3)
Selected writers and topics from Victorian literature, including poetry, fiction, and discursive prose; the various literary movements.

ENGL 547 Modern Literature in English (3)
Selected writers and topics from the turn of the century to World War II.

ENGL 548 Contemporary British Literature (3)
Selected writers and topics since World War II.

ENGL 549 Post-Colonial and Ethnic Literature (3)
Prerequisite: Intermediate College Writing (ENGL 102) or Advanced Composition for Freshman (ENGL 105).
Explores the search for cultural identity in post-colonial and Asian-American novels, plays, and poems.

ENGL 550 Studies in African-American Literature (3)
Prerequisite: Intermediate College Writing (ENGL 102) or Advanced Composition for Freshman (ENGL 105).
In-depth study of selected movements, topics, or groupings of African-American writers.

ENGL 551-552 Special Topics in Literature in English (3-3)
Topics to be announced in Schedule of Courses. A maximum of 6 hours in special-topics courses may be counted toward the major.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

ENGL 561 Chaucer (3)
The language and literature; representative works from the three periods of Chaucer's career examined in relation to their sources and analogues.

ENGL 562 Shakespeare (3)
Intensive study of selected drama and poetry of Shakespeare.

ENGL 563 Milton (3)
Intensive study of the poetry; background reading in Milton's biography and prose.

ENGL 564 Major Figures in American Literature (3)
Studies of the life and works of a major figure, or figures, in literary and social contexts.

ENGL 571 American Literature, Colonial Period to 1865 (3)
Representative figures and works from the Colonial period to the Civil War.

ENGL 572 American Literature, 1865-1910 (3)
Representative figures, works, and literary movements from the Civil War to 1910.

ENGL 573 American Literature, 1910-1960 (3)
Representative figures, works, and literary movements of the period.

ENGL 574 American Literature, 1960 to the Present (3)
Representative writers and works reflecting current developments in American literature.

ENGL 575 Genre Studies in African-American Literature (3)
Prerequisite: Intermediate College Writing (ENGL 102) or Advanced Composition for Freshmen (ENGL 105).
In-depth study of a selected genre of African-American literature.

ENGL 577 The Harlem Renaissance (3)
Prerequisite: Intermediate College Writing (ENGL 102) or Advanced Composition for Freshman (ENGL 105).
In-depth study of the literature of the Harlem Renaissance in relation to other literary and artistic productions of the period and to cultural and historical contexts.

ENGL 581 Renaissance Drama (3)
A survey of Shakespeare's major contemporaries, such as Marlowe, Marston, Jonson, Dekker, Webster, Tourneur, Middleton.

ENGL 586 American Drama (3)
Historical perspectives; emphasis on such dramatists as O'Neill, Anderson, Wilder, Williams, Albee.

ENGL 591 History of Criticism (3)
A study of literary theory as expressed by major critics of Western literature, with emphasis on literary tradition and its relationship to culture.

ENGL 599 Advanced Studies in English (3)
Prerequisite: Writing About Literature (ENGL 310).
In-depth analysis of an intensive writing about a focused area of study within the discipline of English.

ENGL 601 Introduction to English Studies (3)
Introduces students to research methods, print and electronic resources, strategies for reading and writing scholarly texts, and the seminar format.

ENGL 602 Teaching College Composition (3)
Introduction to the design of the freshman composition syllabus, writing assignments, and ways of responding to them.

ENGL 603 Studies in Genres (3)
A course in genre studies, featuring in any given semester the drama, biography, the essay, satire, etc.

ENGL 606 Creative Writing I (3)
A workshop in the writing of poetry, fiction, and drama, involving the reading and analysis of manuscripts and regular individual conferences.

ENGL 607 Creative Writing II (3)
A creative writing workshop similar to Engl. 606, but also allowing interested students to pursue bases for structuring larger and more ambitious works.

ENGL 613-614 Independent Study (1-3)

ENGL 615 Thesis Guidance (1-6)

ENGL 620 Research in the Composing Process (3)
Examination of the major methodologies, quantitative and qualitative, in composition research, with their underlying theoretical assumptions.

ENGL 621 Sociolinguistics (3)
Prerequisite: ENGL/LING 518.
Note: Cross-listed with LING 621.
An examination of the relationship between language and human behavior on various social levels.

ENGL 624 Old English and Middle English Language and Literature (3)
A basic knowledge of Old English as a language is required for the study of literary documents before 1066.

ENGL 625 The Teaching of English as a Second Language (3)
A theoretical and practical approach to teaching English to students for whom English is not a native language. The linguistic bases of English, as well as the application of curriculum principles, will be considered.

ENGL 626 ESL Endorsement Portfolio (1)
Prerequisite: All other ESL endorsement requirements completed.
Assists post-service teachers in preparing and submitting their ESL endorsement portfolios for review in order to complete the continuous assessment plan for the endorsement. Review takes place in the final phase of the course, of which self-assessment and peer assessment are components. Restricted to ESL endorsement candidates.

ENGL 631 Renaissance Drama (3)
Intensive survey of representative non-Shakespearean dramatic works produced in Renaissance England, with attention to literary traditions and modern critical approaches.

ENGL 632 Shakespeare (3)
Intensive study of a large cross-section of the plays, with attention to modern critical approaches.

ENGL 633 Sixteenth-Century Poetry and Prose (3)
Intensive survey of the major literary figures and intellectual traditions of Sixteenth Century England, with attention to modern critical approaches.

ENGL 634 Seventeenth-Century Poetry and Prose (3)
Intensive survey of the major literary figures other than Milton in seventeenth century England, with attention to their literary and intellectual traditions, and to modern critical approaches.

ENGL 642 Eighteenth-Century Fiction (3)
Intensive survey of a diversity of fictional forms and their literary and intellectual traditions, with attention to modern critical approaches.

ENGL 643 Eighteenth-Century Poetry and Prose (3)
Intensive survey of the major literary figures and intellectual traditions of Eighteenth Century England, with attention to modern critical approaches.

ENGL 644 Romantic Poetry and Prose (3)
Intensive survey of the major literary figures and the intellectual traditions of English Romantic Movement, with attention to modern critical approaches.

ENGL 646 Literature in the Secondary Language Arts Curriculum (3)
Prerequisite: Experience teaching English, a course in methods of teaching English in the secondary school, or consent of instructor.
Note: Cross-listed with EDEM/EDSD 646.
Examines theories behind the teaching of literature, research in the teaching of literature, and current trends in the teaching of literature in secondary school language arts.

ENGL 647 Teaching Writing and Language in the Secondary School (3)
Prerequisite: Experience teaching English, a course in methods of teaching English in the secondary school, or consent of instructor.
Note: Cross-listed with EDEM/EDSD 647.
Examines theories of language acquisition and research and methodology in the teaching of grammars, vocabulary, spelling, semantics, etymology, usage, and dialectics in secondary school language arts.

ENGL 651 Nineteenth-Century Fiction (3)
Intensive survey of a diversity of fictional forms and their literary and intellectual traditions, with attention to modern critical approaches.

ENGL 652 Nineteenth-Century Poetry and Prose (3)
An intensive survey of the major literary figures of Nineteenth Century England, with attention to literary traditions and modern theories of interpretation.

ENGL 653 Irish Studies (3)
Intensive study of recent and contemporary Irish writers, with attention to literary and intellectual traditions and to modern critical approaches.

ENGL 654 Twentieth-Century Literature (3)
Intensive study of major writers and literary movements in the English-speaking world during the twentieth century, with attention to literary and intellectual traditions and to the most recent critical approaches.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

ENGL 661 Nineteenth-Century American Fiction (3)
Intensive survey of a diversity of fictional forms and literary and intellectual traditions, with attention to modern critical approaches.

NGL 662 Nineteenth-Century American Poetry and Prose (3)
An intensive survey of the significant literary figures of Nineteenth-Century America, with attention to literary traditions and modern theories of interpretation.

ENGL 663 Twain, James, and Others (3)
A study of the literature of the Gilded Age as it is reflected in the writings of Twain, James, and such contemporaries as Howells, Crane, and Adams.

ENGL 664 Twentieth-Century American Writers (3)
Intensive study of such major American figures as Faulkner, Hemingway, and their contemporaries (adaptable to any combination a particular teacher may announce).

ENGL 665 Contemporary Poetry (3)
A survey or intensive sampling of contemporary poetry.

ENGL 670 Composition Theory and Practice (3)
An exploration of what is known about language, writing, and teaching which treats writing pedagogy as a professional act grounded in theory and informed by a well-defined body of discursive literature.

ENGL 671 History of Rhetoric I (3)
Review of rhetorical theory and practice in the Greek, Roman, early Christian, medieval, and scholastic periods.

ENGL 672 History of Rhetoric II (3)
Review of rhetorical theory and practice in the English Renaissance, the eighteenth and nineteenth centuries, the modern and contemporary periods.

ENGL 673 Rhetoric and Textual Analysis (3)
Selected topics in the rhetorical analysis of fictional and nonfictional texts.

ENGL 674 Interdisciplinary Studies in Rhetoric and Composition (3)
Topics can include cognition and composition, the social construction of knowledge, feminist theory and composition, etc.

ENGL 675 Studies in Professional Writing (3)
Prerequisite: One graduate linguistics or rhetoric course.
Selected topics dealing with research and theory of writing in the professions including science and technology, social sciences, business, and law.

ENGL 681 Seminar in Special Studies (3)
Involves discussion and analysis of advanced research topics leading to the dissertation.

ENGL 682 Seminar in Linguistics (3)
Prerequisite: Introduction to Linguistics (LING 302/ENGL 325) or ENGL/LING 518.
Note: Cross-listed with LING 690.
Selected topics in applied or theoretical linguistics.

ENGL 685 Seminar in Modern British Studies (3)
Involves discussion and analysis of advanced research topics leading to the dissertation.

ENGL 686 Seminar in American Studies (3)
Involves discussion and analysis of advanced research topics leading to the dissertation.

ENGL 687 Seminar in Rhetorical Studies (3)
Prerequisite: ENGL 602.
Advance investigations in rhetoric and composition under a variety of special topics.

ENGL 690 Dissertation Research (1-12)

ENGL 691 Contemporary Theories of Interpretation (3)
A selective survey of theories of interpretation from the New Criticism to the present, and of interpretive practices based on these theories.

Environmental Engineering (5866-ENVE)

Courses in environmental engineering can be used as electives in other programs if approved by the student's program advisor.

ENVE 509 Environmental Processes and Systems (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with CEE 509 and CHE 509
Provides an intensive examination of the scientific and engineering aspects of the environmental problems that face society, stressing all important issues, and directing the student toward recognition of existing technical solutions and the development of new solutions. Covers the basic scientific and engineering principles required to understand natural and designed systems, and presents an engineering approach to analyze natural environmental systems and to develop specific techniques and methods to treat or eliminate existing environmental problems. Students will be required to formulate a design and make a presentation of a technical solution to a specific environmental problem from actual practice.

ENVE 534 Industrial and Waste Management (3)
Note: Cross listed with CHE 534.
A survey of regulations generation, control and management of industrial wastes and environmental hazards: airborne, aqueous, solids and hazardous wastes. Course includes guest speakers, site visits and a term project.

ENVE 560 Environmental Law and Impact Analysis (3)
Prerequisite: Consent of instructor.
A survey of existing regulations pertaining to environmental control. Organization, powers, and responsibilities of federal, state, and local government units. Environmental impact statement preparation. Economic, political, and social implications of environmental problems.

ENVE 570 Environmental Engineering Design (3-4)
Design of various environmental treatment systems, sizing and specifications of equipment. Design and process control systems.

ENVE 630 Physical-Chemical Treatment of Water and Liquid Wastes (3)
A rigorous coverage of the physical and chemical nature of water and waste waters, and application to treatment and water quality characterization. Parameters and methods of analysis. Conventional treatment methods, e.g., flocculation, carbon adsorption, and advanced techniques, including oxidation, electrodialysis, phosphate removal. Occasional laboratory demonstrations and exercises.

ENVE 692 Interactions of the Environment and Society (3-6)
A broad treatment of environmental problems especially tailored to the elementary and secondary school teachers, emphasizing the social and economic impact of environmental problems on our society. Special attention will be devoted to developing educational kits specific to environmental problems for possible incorporation into elementary or secondary course content. Topics of discussion will include water quality, air quality, solid waste disposal, environmental law, noise pollution, and environmental health planning.

ENVE 693 Independent Study in Environmental Engineering (1-6)

ENVE 694 Special Topics in Environmental Engineering (1-6)

ENVE 695 Environmental Engineering Seminar (1-4)

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Exercise Physiology (0737-EXP)

EXP 501 Applied Exercise Physiology (3)
Prerequisite: Consent of instructor.
Selective review of the pertinent areas of basic physiology and the application of this knowledge to exercise conditions. Consists of both lecture and laboratory format. Fall.

EXP 502 Principles of Exercise Testing and Prescription (3)
Prerequisite: EXP 501 or consent of instructor.
Effects of exercise to prevent coronary heart disease and atherosclerosis; specific effects of exercise on the established risk factors. Exercise as a rehabilitative measure in heart attack recovery. Spring.

EXP 503 Selected Topics in Exercise Physiology (3)
Prerequisite: Applied Exercise Physiology (EXP 501) or consent of instructor.
Analysis and critical review of the literature on selected topics relating to exercise performance. Summer.

EXP 600 Physiology of Exercise (3)
Prerequisite: Applied Exercise Physiology (EXP 501), and Human Physiology (EXP 605), or consent of instructor.
Effects of physical activities and work-related stress on the human organism. Includes energy liberation, circulation and respiration, physical work capacity, physical training, energy cost of various activities, nutrition and performance, temperature regulation, factors affecting performance and fitness, physiology of various sport activities. Laboratory demonstrations and projects and discussion of current literature. Spring.

EXP 601 Laboratory Methods in Exercise Physiology (3)
Prerequisite: Consent of instructor
Basic laboratory techniques in Exercise Physiology will be covered, including: oxygen consumption, strength measurement, body composition, etc. General concepts of data collection including validity and reliability will be emphasized. Scientific writing skills will be developed through the use of lab reports. Experimental design and analysis will be briefly discussed. Fall.

EXP 602 Biochemistry of Exercise (3)
Prerequisite: EXP 600 or consent of instructor.
Examination of nutritional, energetic and metabolic aspects of exercise. Emphasis on various biochemical control mechanisms that function during exercise and biochemical adaptations that occur through exercise training. Spring.

EXP 603 Seminar in Exercise Physiology (3)
Reviews, presentations and discussions of current topics in exercise physiology.

EXP 604 Advanced Topics in Exercise Physiology (1-3)
Prerequisite: EXP 600 or consent of instructor.
Independent study under the guidance of a selected faculty member.

EXP 605 Human Physiology (3)
Prerequisite: Consent of instructor.
Fundamental mechanisms of human physiology and study of coordinated body functions. Emphasis on neuromuscular, circulatory, respiratory and endocrine systems. Fall.

EXP 606 Case Study Practicum (3)
Prerequisite: EXP 501/HPES 486, and EXP 502
Analysis and critical review of case studies for special population. Exercise prescription, assessment of test results and lifestyle modifications.

EXP 611 Principles of Electrocardiography (EKG) (3)
Prerequisite: EXP 501 and 605 or consent of instructor.
Mechanical and electrical properties of the heart and skeletal muscle. Basic interpretation of EKG signals and EMG.

EXP 620 Exercise Physiology Clinical Internship (3-6)
Prerequisite: Major in Exercise Physiology and EXP 501, 502, 600, 605.
Corequisite: EXP 503.
Experience in exercise testing prescription, and leadership in Cardiac Rehabilitation. Experiences available for select special populations including the elderly, diabetic, individuals with back pain and pulmonary function problems.

EXP 699 Thesis (1-6)
Prerequisite: Consent of advisor.
Pass/Fail.

Expressive Therapies (0260-ET)

ET 601 Clinical Art Therapy I: Theories (3)
Prerequisite: Admission to the program.
Overview of history and theoretical approaches in art therapy. Emphasis on the ETC, MDV, defense mechanisms, graphic development, and life span clinical issues as they interface with managed care and performance indicators. Cultural issues related to the clinical context will be explored.

ET 604 Clinical Art Therapy II: Assessment and Practice (3)
Prerequisite: Admission to the program.
Fundamentals of graphic analysis, the indicators of various psychopathologies, and the application of interventions in treatment (according to DSM IV). Practice in interpretation of drawings and case discussion.

ET 611 Applied Methods (2)
Prerequisite: Concurrent with ET 601.
Studio-lab in the practical application of expressive and therapeutic techniques, role playing, and symbolic awareness.

ET 617 Field Studies I (2)
Prerequisite: Admission to the program.
Provides students with opportunities to visit and evaluate practicum sites. Students will analyze skills necessary for art therapy field work at various practicum sites, and will assess their interests and skill level for various practicum opportunities.

ET 618 Field Studies II (2)
Prerequisite: ET 604, 611, and 617.
Provides students with their first practicum experience, spending 4 hours per week on-site at a local facility with an art therapist. Student is responsible for a minimum of 2 hours per week in the role of art therapist with individuals or groups. Course offered every spring semester.

ET 620 Clinical Supervision (1)
Prerequisite: Art Therapy majors and consent of instructor.
Teaches clinical supervision skills to the advanced student. Advanced students will supervise and guide the first-year students' practical applied experience under the direction of the faculty member responsible for the class. Spring.

ET 621 Topical Seminar in Research (3)
Prerequisite: ET 604 and 618.
Seminars on basic research methods and art therapy research development. Student will analyze and critique unpublished and published research and will develop a research proposal.

ET 622 Master's Research Seminar (3)
Prerequisite: ET 621.
Seminar presentation of case data and research leading to completion of a master's paper in art therapy.

ET 623 Practicum I (5)
Prerequisite: Completion of all academic work; art therapy majors only.
Art therapy practice at local setting.

ET 624 Practicum II (5)
Prerequisite: Art therapy majors only.
Art therapy practice at local or national setting.

ET 630 Research in Expressive Therapies (1-3)
Prerequisite: Art therapy majors and consent of instructor. (Can be repeated for a maximum of 9 hours.)

ET 633 Independent Study in Expressive Therapies (1-3)
Prerequisite: Consent of instructor.

ET 636 Expressive Therapies Seminar (I-3)
Prerequisite: Consent of instructor.
Special topics or experimentation in expressive therapies.

ET 642 Symbols of Self-Actualization (2)
Prerequisite: Consent of instructor.
Study of symbols encountered in the development of self in art, mythology, and psychology. Emphasis on archetypal ego symbolism and symbols of transformation and their exploration through art expression.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

ET 646 Expressive Techniques in Psychotherapy (2)
Prerequisite: Consent of instructor.
Teaches theory and techniques from various expressive modalities including relaxation, guided imagery, play, dance/movement, focusing, music drama, poetry, contour drawing, and problem-focused art therapy.

ET 648 Advanced Group Art Therapy (2)
Prerequisite: Consent of instructor.
Foundations in group dynamics and group therapy through expressive art techniques; experiential therapy basis will be used.

ET 649 Group Leadership Skills (2)
Prerequisite: Consent of instructor.
Role of group leader with specific attention to group design, formation and development as it applies to art therapy. Acquisition of group leadership skills through extensive role playing and practice sessions.

ET 651 Group Therapy Seminar (2)
Prerequisite: ET 648 and 649, or consent of instructor.
Integrates group theory with practice. Videotapes will be focus for discussion of groups as a method of behavior change.

ET 652 Medical Counseling (2)
Prerequisite: Consent of instructor.
Emphasizes the facilitation of coping strategies in individuals and families facing serious illness or grief.

ET 653 Grief Counseling (2)
Prerequisite: ET 652.
Development of counseling skills to aid individuals ability to cope with grief. Expressive techniques will be used to facilitate understanding. An individual case study or video tape is required.

ET 654 Imagery and Cognition in Healing (2)
Prerequisite: Mental health or health practitioner training, including courses in counseling or psychotherapy.
The use of imagery, cognition, and relaxation to increase the patients' participation in the management of rheumatoid arthritis, migraine headaches, hypertension, cancer and low back pain.

ET 655 Art for Children with Special Needs (2)
Prerequisite: Consent of instructor.
Focuses on children's emotional needs and the role expressive experiences play in meeting these emotional needs.

ET 661 Theories of Psychotherapy (3)
Prerequisite: Art therapy majors only.
Introduces art therapy students to a variety of theories of psychotherapeutic intervention with individuals and groups including practical applications of these theories.

ET 690 The Expressive Therapies Continuum (2)
Prerequisite: Consent of instructor.
Investigates the theoretical basis of the four levels of the continuum: the kinesthetic-sensory, perceptual-affective, cognitive-symbolic, and creative. Augmenting the theoretical implications, will be the practical implementation in clinical setting.

Finance (0559-FIN)

FIN 500 Business Finance (1.5)
Prerequisite: ACCT 500, ECON 500, MGMT 501; fulfills a Foundation Core requirement only.
A study of the investment and finance functions in the firm and of the financial environments in which the firm operates.

FIN 600 Financial Management (3)
Prerequisite: FIN 500.
The application of financial theory and analytic techniques to the investment and financing decisions of organizations operating within complex product and financial markets.

FIN 610 Corporate Financial Policies (3)
Prerequisite: FIN 600.
An advanced course in corporate finance. Topics covered include the analysis and budgeting of funds, the control of investments in receivables and inventory, short- and long-term financing, the planning of debt policy and capital structures.

FIN 620 Financial Institutions and Capital Markets (3)
Prerequisite: ACCT 500, MGMT 501, and FIN 500.
The characteristics, problems, and policies of financial institutions and their relationships to the capital markets are analyzed. Emphasis is placed upon the operation of the commercial banking and Federal Reserve systems, but other types of financial institutions are studied. The various financial instruments used in the capital markets are also discussed.

FIN 630 Investment Analysis (3)
Prerequisite: ACCT 500, ECON 500, MGMT 501, and FIN 500.
The analysis of security values for individual and institutional purposes. Business conditions, capital markets, industry characteristics, and company analysis are examined in their relationship to security analysis.

FIN 640 Management of Financial Institutions (3)
Prerequisite: ACCT 500, ECON 500, MGMT 501, and FIN 500.
Application of analytical techniques to the solution of financial problems faced by management of financial institutions, especially commercial banks, but also insurance companies and saving and loan associations. Topics include reserve management, commercial and mortgage loan policy, investment policy, and expansion via branching, merger, and holding companies. Not regularly offered.

FIN 670 International Finance (3)
Prerequisite: FIN 600
A study of the international monetary system with particular emphasis upon the role and function of multinational corporations within the system. Examines exchange rates, parity conditions, capital flows, and international banking. Capital formation and budgeting are discussed within an international context.

FIN 680 Special Topics in Finance (1-6)
An advanced study of one or more selected topics or issues related to the study of Finance.

FIN 698 Research Seminar in Finance (1-3)
Prerequisite: One 600-level course in finance and permission of departmental chair.

Foreign Language Education (0323-FLE)

FLE 521 Teaching Techniques in Foreign Languages (3)
Prerequisite: Current status as a foreign language teacher or consent of instructor.
Teaching methods in foreign languages. Recommended for those teaching or preparing to teach languages.

FLE 561-562 Independent Study (1-3)
Prerequisite: Consent of instructor.
Designed for independent study projects in foreign language education.

FLE 600 Summer Workshop for Foreign Language Teachers (3)
Prerequisite: Current status as a foreign language teacher or consent of instructor.
This course is envisioned as having different subject matter each time offered. In an intensive two-to-three-week workshops, to be held in the summer on the Shelby Campus, a different pedagogical topic will be explored in workshop fashion during a six-to-seven hour day. In addition, optional evening activities will be planned.

FLE 620 Special Topics in Foreign Language Education (3)
Prerequisite: Current status as a foreign language teacher or consent of instructor.
A course with variable subject matter designed for foreign language teachers and prospective teachers. Will be offered as need arises.

FLE 622 Psychology of Second Language Learning and Teaching (3)
Prerequisite: Current status as a foreign language teacher or consent of the instructor.
This course will treat psychological variables in the learning and teaching of foreign languages. Special attention will be focused on aptitude, attitude, and motivation as they affect learning and teaching languages. This is not a methods of teaching foreign languages course.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

FLE 623 Culture as the Basis of Foreign Language Teaching (3)
Prerequisite: Current status as a foreign language instructor. Emphasis will be placed on techniques for teaching culture through language, for preparing culturally oriented teaching materials (e.g., cultural assimilators), and for carrying out cultural field work abroad.

FLE 624 The Teaching of English as a Second Language (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with ENGL 625.
A theoretical and practical approach to teaching English to students whose native language is not English. The linguistic bases of English will be considered, as well as the application of curriculum principles.

Foundations of Education (0743-EDFD)

EDFD 596-597 Seminar in Foundations of Education (1-4)
Prerequisite: Consent of the dean.
The investigation of special problems in education.

EDFD 600 Introduction to Research Methods and Statistics (3)
Critical examination of research in education. Emphasis given to historical, empirical, and experimental methods of research; to techniques of research design and statistical analysis; and to skills in writing reviews and critiques of research literature.

EDFD 601 Applied Statistics (3)
Prerequisite: EDFD 600.
Note: EDFD 603 is an optional lab.
Examination of statistical methods, including sampling, estimation, testing of hypotheses, correlation and regression analysis. Some attention paid to nonparametric tests.

EDFD 602 Survey Research and Attitude Measurement (3)
Techniques for construction of evaluation instruments. Special attention given to surveys and questionnaires, sampling and scaling of attitudes and opinions.

EDFD 603 Communication of Statistical Data Analysis (1)
Prerequisite: EDFD 601.
Corequisite: EDFD 601.
Data analyses using SPSS for Windows, focusing on numerical and graphical data description and inferential testing covered in EDFD 601. Communicating statistical results by writing APA Methods and Results sections including tables and figures in a word processor using the student's own data set. Pass/Fail grading.

EDFD 606 Evaluation of Educational Processes (3)
Study of techniques and methodologies for evaluation of educational processes, including teacher evaluation of classroom activities and system-wide evaluation of ongoing programs.

EDFD 620 Comparative Education (3)
Utilizing such recurring themes as social stratification, denominational control, and colonialism and cultural pluralism, analyzes roles of selected educational systems in international and comparative perspective.

EDFD 625 History of American Education (3)
Note: Cross-listed with HIST 625.
Examination of the function of educational processes in the context of American political, economic, and social history.

EDFD 630 The School in the American Social Order (3)
Examination of the school as a social institution, with emphasis on the inter-relationship of the school with other social, political, and economic organizations.

EDFD 631 The Social Context of Occupational Training & Development (3)
Examines social factors that influence adult motivation and performance in occupational training and development programs. Readings include theory and research on adult motivation in work and learning, social stratification, and organizational culture.

EDFD 640 Developing a Philosophy of Education (3)
Study of philosophic assumptions and principles governing the American school and the application of these assumptions and principles to practical problems of learning, teaching, and administration.

EDFD 680 The American College and University (3)
Examination of historical development of the American college, community college, and university, including major ideas and concepts underlying these developments and major problems affecting present institutions of higher learning.

EDFD 681 The Philosophy of Higher Education (3)
Analysis of competing philosophies of higher education, with the purpose of helping students construct consistent sets of beliefs about values in higher education as a guide to administrative and academic decisions.

EDFD 696 Independent Study in Foundations of Education (1-3)
By arrangement with dean and advisor.

EDFD 699 Thesis or Professional Paper (2-5)
Prerequisite: EDFD 600; consent of advisor and dean. For M.A. and M.Ed. only.

EDFD 700 Research Concepts and Design (3)
Prerequisite: EDFD 601 or consent of instructor.
Explores the logic of inquiry and examines and critiques a wide variety of research approaches. Students develop at least two approaches to researching a specific topic.

EDFD 701 Multivariate Educational Statistics (3)
Prerequisite: EDFD 601
Examines multivariate statistical methods used by educational researchers, including multiple regression, multivariate analysis of variance, and factor analysis. Computer software packages are extensively used.

EDFD 702 Design of Experiments (3)
Prerequisite: EDFD 601.
Examines experimental and quasi-experimental designs, internal and external threats to validity, and serendipity. Includes some programming and data processing. 3 hrs. class and/or 1 1/2 hrs. lab.

EDFD 704 Qualitative Field Research Methods (3)
Prerequisite: SOC 615, Ed.D., student, or consent of instructor.
Note: Cross-listed with SOC 618
Provides opportunities to design and critique field studies in educational and social settings and to practice techniques used to collect and analyze qualitative. Additional time required outside class for observations and interviews.

EDFD 730 Foundations of Urban Educational Policy (3)
Prerequisite: Admission to Ed.D. program or consent of instructor.
An examination of urban educational policy from philosophical, social, historical, psychological, and legal points of view.

EDFD 750 Doctoral Seminar in Educational Evaluation (3)
Prerequisite: EDFD 606; Ed.D. students or by consent of instructor.
Covers advanced topics in educational evaluation. Discussion of policy issues and quantitative and qualitative methods.

EDFD 760 Doctoral Internship in Educational Evaluation (3-6 hrs.)
Prerequisite: Ed.D. students in the evaluation specialty area, and consent of instructor required.
Provides on-the-job learning experiences for future educational evaluators.

EDFD 790 Problems in Urban Education and Society (3)
Prerequisite: Twelve hours in Urban Studies component of Ed.D. including EDFD 730; restricted to Ed.D. students or consent of instructor.
Culminating course in Urban Studies component of Ed.D.; with guidance from the instructor, students select and explore a problem that enables them to apply their course of study to some aspect of the urban environment.

EDFD 795 Doctoral Research (1-15)
Prerequisite: Passing Ed.D. Comprehensive.
Note: Cross-listed with EDAD, ECPY, EDSP, EDUC 795.
Examination and admission to candidacy for the doctoral degree.

EDFD 796 Research Literature (1-6)
Prerequisite: Consent of instructor.
For post-masters students candidates only.

EDFD 799 Professional Paper (1-5)
For Ed.S. candidates only.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

French (0325-FREN)

At least two courses on the 500 or 600 level will be offered for graduate students every semester. Course offerings are contingent upon sufficient enrollments. Regularly scheduled 500-level courses may be replaced by seminars, or studies of particular authors or specific topics.

FREN 500 French Work Exchange (3 or 6)
Prerequisite: Membership in a University of Louisville Work-Exchange Program with Montpellier administered by the International Center.
Credit awarded upon demonstration of successful completion of course undertaken with prior approval of the department. Cooperating businesses in Montpellier provide jobs for participants who gain practical experience in a French work environment. May be repeated; however only three credits can be applied to a French major.

FREN 501-502 Main Currents of French Literature (3-3)
Prerequisite: Introduction to the Study of French Literature (FREN 355) or other training in reading literary texts.
Development of French Literature, with emphasis on major authors and movements. 501: Middle Ages to 1800. 502: 1800 to present.

FREN 510 Francophone Literature (3)
Prerequisite: Consent of instructor.
French literature written outside of France. May include African, Caribbean, Canadian, Swiss and/or Belgian literature.

FREN 511 Old French Literature (3)
Prerequisite: Consent of instructor.
A survey of French literature of the Middle Ages.

FREN 513 Literature of the Renaissance (3)
Prerequisite: Consent of instructor.
Intensive study of selected literary works of the Renaissance.

FREN 514 Literature of Classicism (3)
Prerequisite: Consent of instructor.
Intensive study of selected masterpieces of the Classical period.

FREN 515 Studies in the Age of Enlightenment (3)
Prerequisite: Consent of instructor.
Intensive study of selected writers from the century of the Philosophes.

FREN 516 French Literature, 1800-1850 (3)
Prerequisite: Consent of instructor.
Intensive study of selected works from the period.

FREN 517 French Literature, 1850-1900 (3)
Prerequisite: Consent of instructor.
Intensive study of selected works from the period.

FREN 518 French Literature, 1900-1950 (3)
Prerequisite: Consent of instructor.
Intensive study of selected writers and literary movements from the period.

FREN 519 French Literature after 1950 (3)
Prerequisite: Consent of instructor.
Intensive study of selected writers and literary movements from 1950 to the present.

FREN 522 French Phonetics and Diction (3)
Prerequisite: 6 hours of French at senior-college level or consent of instructor.
Pronunciation, diction, and intonation in theory and practice. Corrective exercises, recordings for the analysis of individual pronunciation problems. Poetry and prose studied in phonetic transcription, using the International Phonetic Alphabet; extemporaneous speaking and prepared readings.

FREN 523 Advanced Composition and Conversation (3)
Prerequisite: French Conversation (FREN 321) and French Composition (FREN 322) or consent of instructor.
An upper-division and graduate-level course in oral and written expression in French. Emphasis on oral and written reports, stylistic training, intensification of vocabulary.

FREN 531 Studies in French Culture (3)
Prerequisite: Consent of instructor
Intensive study of an aspect of French culture.

FREN 561-562 Independent Study I,II (1-3)
Prerequisite: Consent of department.
Independent study in areas not covered in the regular curriculum.

FREN 599 Special Topics (3)
Prerequisite: Consent of instructor.
Topics of a unique or specialized nature in French language, literature or culture.

FREN 606 Ecrits et Lectures Féminins (3)
Prerequisite: Graduate standing in French or consent of instructor.
Readings in French creative and critical works by Francophone women from the Middle Ages to the present. Readings and discussions conducted in French.

FREN 621 History of the French Language (3)
Prerequisite: Consent of instructor.
Evolution of the French language from earliest times to present. Linguistic analysis of representative literary and nonliterary texts.

FREN 622 Comparative Romance Philology (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with SPAN 622.
Comparative phonological and morphological study of the Romance languages from the earliest times to the present, with special attention to the formative years.

FREN 624 French Applied Linguistics (3)
Prerequisite: Consent of instructor.
A course designed especially for French teachers; will deal with the phonology, morphology, syntax, and semantics of contemporary French. The pedagogical implications of linguistic analysis will be discussed in depth.

FREN 670 Special Topics (3)
Prerequisite: Consent of instructor.
Selected topics in French language, literature, or culture. Topics chosen will reflect the needs of the students and the background of the instructor. May be repeated under different subtitles.

FREN 680 Seminar (3)
Prerequisite: Consent of instructor.
Selected writers or personalities in French language, literature, or culture. Topics chosen will reflect the needs of the students and the background of the instructor. May be repeated under different subtitles.

FREN 690 Thesis (3-6)

Geography (0330-GEOG)

GEOG 501 Kentucky Field Course (3)
Prerequisite: 6 hrs. geography or consent of instructor.
Assesses the physical character, resources, people, patterns of development, and regional relationships of the Commonwealth through field study. 3 hrs. lect. and 14 hrs. per week field trips. Summer.

GEOG 520 Geography and Nutrition Among African and African-American Populations (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with PAS 560.
Comparison of geographical conditions, food culture, technology and socioeconomic factors among Africans and African-Americans affecting health and nutrition.

GEOG 528 Urban Planning (3)
Prerequisite: Urban Geography (GEOG 328) or consent of instructor.
Fundamentals of urban land use planning including the analysis of development patterns, infrastructures and zoning. Emphasis on planning used locally. Credit may not be earned in both 528 and 628.

GEOG 530 Geography of Transportation and Distribution Systems (3)
Prerequisite: Economic Geography (GEOG 327) and consent of instructor.
Analysis of distribution and transportation systems as functional entities capable of introducing and reacting to change within the economic region.

GEOG 535 Retail Site Analysis (3)
Prerequisite: Economic Geography (GEOG 327) and Quantitative Methods in Geography: Stochastic Models (GEOG 356) or consent of instructor.
Examination of market structure, retail environment and physical site characteristics. Utilizes current practices in discipline to determine optimum retail location. Credit may not be earned in both 535 and 635.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

GEOG 541 Teaching Geography (3)
Prerequisite: For teachers or prospective teachers.
Methods and materials in geography instruction for elementary and secondary schools. Credit may not be earned in both 541 and 641.

GEOG 550 The Greater Louisville Region (3)
Prerequisite: Urban Geography (GEOG 328) or consent of instructor.
Directed field study of urban problems in the greater Louisville region and vicinity, including population, migration, transportation, and pollution. Offered as needed.

GEOG 555 Surveying and Mapping (3)
Prerequisite: Precalculus (MATH 190) and Introduction to Mapping (GEOG 350).
Examination of methods used in surveying, plane table mapping, and photogrammetry with emphasis on the compilation of maps from field data. Fall.

GEOG 557 Advanced Geographic Information Systems (3)
Prerequisite: Introduction to Geographic Information Systems (GEOG 357).
Application of advanced GIS concepts to real-world projects. Will focus on development and implementation of a digital geo-spatial data base. The project will be carried from the design phase through completion.

GEOG 561 Urban Environmental Quality (3)
Prerequisite: Consent of instructor.
A study of environmental aspects of urban areas and analysis of inter- and intra-city variations in environmental quality.

GEOG 578 Downtown Change and Development (3)
An analysis of the morphology, development and function of central business districts with a special emphasis on downtown Louisville.

GEOG 590 Special Topics (3)
Investigation of topics not offered in regular courses. Topic will be announced in Schedule of Courses. May be repeated for different topics up to a limit of 12 hours. Offered as needed.

GEOG 595 Internship in Geography (1-4)
Prerequisite: Consent of instructor and agency.
Individual placement in a private or governmental agency where geographic techniques will be utilized in approaching practical problems.

GEOG 599 Directed Reading in Geography (1-4)
Prerequisite: Advanced courses in geography or related fields; permission of major department.
Supervised readings centered around a specific region or topical field for advanced work of research purposed.

GEOG 628 Advanced Urban Planning (4)
Prerequisite: Consent of instructor.
Fundamentals of urban land use planning including the analysis of development patterns, infrastructures and zoning. Emphasis on planning used locally. Students enrolled in this course, which is concurrent with the 500-level course, must meet for an additional hour per week. There will be substantial research and independent study required for graduate credit. Credit may not be earned in both 528 and 628.

GEOG 635 Advanced Retail Site Analysis (4)
Prerequisite: Economic Geography (GEOG 327) and consent of instructor.
Examination of market structure, retail environment and physical site characteristics. Utilizes current practices in discipline to determine optimum retail location. Students enrolled in this course, which is concurrent with the 500-level course, must meet for an additional hour per week. There will be substantial research and independent study required for graduate credit. Credit may not be earned in both 535 and 635.

GEOG 641 Teaching Geography (3)
Methods and materials in geography instruction for elementary and secondary schools. Credit may not be earned in both 541 and 641.

GEOG 656 Spatial Statistics (3)
Prerequisite: Statistics Course.
The analysis of spatial patterns and processes through the use of spatially-based statistics.

GEOG 657 Geographic Information Systems (4)
Prerequisite: Computer Mapping (GEOG 359).
An introduction to the processing of spatial data, GBF-Dime File manipulation, geographic data base managing advanced computer techniques, Geographic information systems. Students enrolled in this course, which is concurrent with the 500-level course, must meet for an additional hour per week. There will be substantial research and independent study required for graduate credit. Credit may not be earned in both 557 and 657.

GEOG 658 Analytical Urban Geography (3)
Prerequisites: Urban Geography (GEOG 328), Urban Sociology (SOC 305) or consent of instructor.
Advanced analysis of urban spatial processes and patterns with an emphasis on quantitative models.

GEOG 690 Special Topics (3)
Investigation of topics not offered in regular courses. Topic will be announced in Schedule of Courses. May be repeated for different topics up to a limit of 12 hours. Offered as needed.

GEOG 691 Research and Independent Study (1-5)

Geosciences (0333-GEOS)

GEOS 510 Geosciences for Teachers (3)
Principles of the earth sciences and their application to the local region; identification of common minerals, rocks, and fossils. 2 hrs. lect., 2 hrs. lab. (field trips to be arranged). Summer.

GEOS 563 Physical Climatology (3)
Prerequisite: Climatology (GEOG 363); or Physical Geography (GEOG 202) and consent of instructor; or one semester of calculus; or consent of instructor.
Study of the physical processes that control the atmospheric environment; emphasis on energy, mass and momentum exchanges and physical causes of the global circulation.

GEOS 564 Hydrology (3)
Prerequisite: Physical Geography (GEOG 202) or Physical Geology (GEOL 201), or consent of instructor.
Advanced study of the hydrologic cycle, drainage basin analysis, stream flow and flooding, pollution and utilization of water resources.

GEOS 565 Geologic Hazards (3)
Prerequisite: Physical Geology (GEOS 201) or Structural Geology (GEOS 330).
Environmental significance of natural hazards, risk assessment methods. A discussion of earthquakes, flooding; landslides/expansive soil and volcanic eruptions. Hazards reduction and mitigation strategies.

GEOS 590 Selected Topics in Geosciences (3)
Prerequisite: Consent of instructor.
A detailed investigation of some restricted topic of geology or related discipline. Topic to be announced in Schedule of Courses.

GEOS 691 Research and Independent Study (1-5)

German (0334-GERM)

At least one course on the 500 or 600 level will be offered for graduate students every semester. Course offerings are contingent upon sufficient enrollments. Regularly scheduled 500-level courses may be replaced by seminars, or studies of particular authors or specific topics.

GERM 500 German Study Abroad (1-15)
Prerequisite: Membership in a University of Louisville Language Study Abroad Program or a program approved by the Department.
Credit awarded upon demonstration of successful completion of program undertaken with prior approval of the department, including a paper or project and an oral or written examination in the language and culture, administered under the supervision of a faculty member.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

GERM 501-502 Survey of German Literature I & II (3-3)
Prerequisite: Introduction to German Literature (GERM 355) or other training in reading literary texts.
Development of German literature, with emphasis on major authors and movements. 501: Middle Ages to 1800. 502: 1800 to present.

GERM 511 Studies in Medieval German Literature (3)
Prerequisite: Consent of instructor.
Readings selected from the literature of the early, middle, and late German Middle Ages.

GERM 513 Studies in Early New High German and Baroque Literature (3)
Prerequisite: Consent of instructor.
Readings selected from the Renaissance to the Baroque.

GERM 515 Studies in Eighteenth-Century Literature (3)
Prerequisite: Consent of instructor.
Readings selected from the Enlightenment, Storm and Stress, and Weimar Classicism.

GERM 517 Studies in Nineteenth-Century Literature (3)
Prerequisite: Consent of instructor.
Readings selected from Romanticism, Realism, Naturalism, and Impressionism.

GERM 518 Studies in Twentieth-Century Literature (3)
Prerequisite: Consent of instructor.
Readings selected from the turn of the century to the present.

GERM 519 German Intellectual History (3)
Prerequisite: Introduction to German Literature (GERM 355) or equivalent.
Consideration of German thought and sensibility from the Middle Ages to the present. Readings from medieval mysticism to postmodernism. Taught in English with German readings. Credit may not be earned for this course and ML 519.

GERM 520 The Age of Goethe (3)
Prerequisite: Introduction to German Literature (GERM 355) or equivalent.
Introduction to the cultural renaissance that Germany experienced roughly during the life of Goethe (1749-1832). Consideration of the theater, poetry, art, music, and social life from the twilight of the Baroque through the end of Romanticism.

GERM 521 German of Today (3)
Prerequisite: Consent of instructor.
Present usage of German in syntax and synonymy. Idioms. Important recent changes in the language. Receptivity of foreign influences and efforts to maintain linguistic purity.

GERM 523 Advanced Composition and Conversation (3)
Prerequisite: German Conversation & German Composition I & II (321-322) or consent of instructor.
An upper-division and graduate-level course in oral and written expression in German. Emphasis on oral and written reports, stylistic training, intensification of vocabulary.

GERM 531 Cultural History of the German-Speaking Area (3)
Prerequisite: Consent of instructor.
Chronological survey of important manifestations of German culture.

GERM 561 Independent Study (3)
Prerequisite: Consent of department.
Independent study in areas not covered in the regular curriculum.

GERM 599 Special Topics (3)
Prerequisite: Consent of instructor.
Topics of a unique or specialized nature in German language, literature or culture.

GERM 621 History of the German Language (3)
Prerequisite: Consent of instructor.
Philological development of the German language from its earliest documents to the present, with specimens illustrating important changes.

GERM 624 German Applied Linguistics (3)
Prerequisite: Consent of instructor.
A course designed especially for German teachers; will deal with the phonology, morphology, syntax, and semantics of contemporary German. The pedagogical implications of linguistic analysis will be discussed in depth.

GERM 670 Special Topics (3)
Prerequisite: Consent of instructor.
Selected topics in German language, literature, or culture. Topics chosen will reflect the needs of the students and the background of the instructor. May be repeated under different subtitles. Topics will vary from semester to semester.

GERM 680 Seminar (3)
Prerequisite: Consent of instructor.
Selected topics in German language, literature, or culture. Topics chosen will reflect the needs of the students and the background of the instructor. May be repeated under different subtitles.

GERM 690 Thesis (3-6)

Healthcare Administration (0561-HADM)

HADM 620 Introduction to the Business of Healthcare Systems (3)
Examines topics from various business areas. Possible topics include cost-benefit analysis, managed care issues, information systems and medical informatics; cost concepts and decision making; product costing and accounting systems; operations management-TQM; and healthcare marketing. Credit cannot be earned for both MGMT 654 and HADM 620.

HADM 621 Health Economics (1.5)
Applied economics in the health service sector. Examines issues of efficiency, insurance, government programs, and the supply and demand for medical services in the hospital and physician market.

HADM 622 Managed Care (1.5)
Familiarizes the student with the various service delivery models of managed care systems. Students will learn how to evaluate different managed care models and how contracting and incentives affect the quality of care.

HADM 624 Management Accounting and Cost Analysis for Healthcare (1.5)
Study of accounting and financial management procedures and techniques in the healthcare industry. Examines accounting problems unique to the healthcare industry. Applies general accounting analysis and management accounting techniques to healthcare settings.

HADM 625 Healthcare Quality and Operations Management (1.5)
Reviews the field of operations management relating to the healthcare market. Examines the relationship between operations research and the management of complex healthcare delivery organizations. Focuses on formulating competitive strategies in operation management decision areas including system design, quality measurement, and productivity analysis.

HADM 626 Healthcare Marketing (1.5)
Focuses on the application of marketing concepts in healthcare organizations, specifically hospital, insurance, and physician markets. Application of marketing concepts such as market segmentation planning, positioning and product mix.

HADM 627 Management of Health Services Organization (1.5)
A systematic study of the roles of health services managers and the organizational and environmental context within which they work. An analysis of healthcare organizations with emphasis on management structures.

HADM 628 Medical Informatics (1.5)
Surveys the use of information systems in healthcare, emphasizing strategies useful in system development and acquisition. Topics include: History of healthcare information systems; applications of information technology to healthcare delivery; how to manage information technology; and information technology as an enabling technology.

HADM 629 Healthcare Finance (1.5)
Prerequisite: FIN 500 or HADM 625
Applied techniques that enable organizations to efficiently manage their financial resources in the unique healthcare setting. Topics include financial analysis, strategic financial planning, capital project analysis, capital structure considerations, and working capital management.

HADM 631 Healthcare Policy (3)
Prerequisite: PADM 620.
Elucidates theories of public policy and applies them to health issues. The course covers the evolution of healthcare and discusses policy options. Major issues of health delivery and finance are also covered within this context.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

HADM 632 Healthcare Law (3)
Prerequisite: PADM 620.
Covers the legal aspects of healthcare. This includes the structure of the judicial system, legal procedures, torts, criminal aspects, contracts and corporate liability. Other legal aspects include malpractice, patient rights and the nature of the nursing profession.

HADM 680 Special Topics in Healthcare (1-3)
Advanced study in one or more selected topics or issues related to the study of healthcare administration.

HADM 698 Research Seminar in Healthcare Administration (1-6)
Prerequisite: HADM 620 and permission of program head.

Health Promotion, Physical Education and Sport Studies (0753-HPES)

HPES 501 Stress and Tension Control (3)
Prerequisite: Human Anatomy and Physiology for Non-Biology Majors (BIOL 360), Structure and Function in the Movement Sciences (HPES 386) or consent or instructor.
A study of physiological, sociological, and psychological stresses and their underlying mechanisms of action. Emphasis on modification of stress via developed proficiency in relaxation techniques.

HPES 503 Obesity: Causes, Control (3)
Prerequisite: Human Anatomy and Physiology for Non-Biology Majors (BIOL 360), Structure and Function in the Movement Sciences (HPES 386) or equivalent.
A study of the physiological, psychological, and sociological factors in the development and modification of obesity. Laboratory experiences in the assessment of obesity will be provided.

HPES 504 Physical Activity and Health (3)
Prerequisite: Consent of instructor.
A study of the positive and negative influences of physical activity on diseases and infirmities that affect a healthy life style.

HPES 505 Stress and Disease (3)
Prerequisite: Human Anatomy and Physiology for Non-Biology Majors (BIOL 360), Structure and Function in the Movement Sciences (HPES 386) or equivalent.
Relationship of stress to acute and chronic disease and the effects of contemporary stressers on psychophysiological responses. Examination of mechanisms of adaptation, treatment, and prevention.

HPES 530 Nutrition and Athletic Performance (3)
Prerequisite: Consent of instructor.
Principles of nutrition with special emphasis on nutrient and energy needs of athletes of optimal performance.

HPES 531 Organization and Administration of Health Education and Promotion (3)
Analysis of administrative and organizational factors of health education and promotion from within the program, within the organization, and between organizations. Emphasis will be placed on policy making, administration, and functional issues such as collaboration and consultation at the organizational level.

HPES 562 Alcohol and Drug Education (3)
Study of key components of alcohol and drug education, i.e., self-concept information, coping skills, refusal skills, and decision making. Alcohol and drug education programs at the national, state, and local level will be reviewed.

HPES 564 Women's Health (3)
Examines relationship of women to health and healthcare. Comparison and contrast of health concerns unique to women and common to both sexes at all ages.

HPES 565 Nutrition for Children and Adolescents (3)
Nutritional needs during childhood are covered with emphasis on diet evaluation, menu planning and disease prevention. Nutrition units will be developed using the curriculum planning map.

HPES 567 Healthy Sexuality and Aids Education (3)
A study of the basic competencies required for AIDS/STD education and prevention within the framework of healthy sexual functioning.

HPES 575 Administration of Physical Education Program and Athletics (3)
Administration of the total physical education program on the secondary school level, including units on budget, staff, facilities, programs, equipment, public relations, and evaluation.

HPES 589 Prevention and Care of Athletic Injuries II
Prerequisite: Prevention and Care of Athletic Injuries I (HPES 389) or equivalent or consent of instructor.
Focuses on basic anatomy and its relationship in sports-induced injuries. Provides framework for adapting prevention, evaluation, management and rehabilitation techniques to aid in the treatment of athletic injuries.

HPES 597 Special Topics in HPES (1-3)
Prerequisite: Consent of instructor.
Examination of well-defined topics not studied in regular courses. Topics will be announced in Schedule of Courses.

HPES 598 Independent Study in HPES (1-3)

HPES 601 Philosophy of Sport and Physical Education (3)
Study of sport from various philosophical positions. Relation of theories and thoughts about what constitutes sport to particular time periods. Offered as needed.

HPES 604 Research Methods in HPES
Prerequisite: HPES Tests and Measurements (HPES 377)
Techniques used in developing the research project. Development of outline for action research project.

HPES 605 Methods in Elementary Physical Education (3)
Prerequisite: Admission to M.A.T.
Philosophy, objectives, curriculum, and methods of teaching physical education to elementary children.

HPES 606 Methods in Secondary Physical Education (3)
Prerequisite: Admission to M.A.T.
A study of methods and materials for teaching physical education in grades 6-12. Must be taken prior to student teaching.

HPES 607 Methods of Supervision in Physical Education (3)
Covers various models of supervision. Several systematic observational data collection systems will be used to develop skills for supervision in physical education.

HPES 608 Curriculum: An Achievement Based Approach (3)
Prerequisite: Admission to M.A.T.
Presents a variety of curricular approaches to physical education along with activities to help the teacher deliver the content.

HPES 610 Experiential Outdoor Education Leadership (3)
Prerequisite: Admission to M.A.T.
Teaches necessary skills to lead outdoor experiential education programs.

HPES 611 Seminar in Student Teaching in Physical Education (3)
Prerequisite: Admission to M.A.T.
Corequisite: HPES 612 and HPES 613.
Designed as an analysis of student teaching activities for the purpose of improving instructional competence, developing professionalism and reflective teaching skills, and understanding the learner within the instructional context.

HPES 612 Student Teaching in Physical Education I (6)
Prerequisite: Admission to M.A.T.
Corequisite: HPES 611
Provides supervised observation, participation and teaching in physical education at the elementary and secondary school levels.

HPES 613 Student Teaching in Physical Education II (6)
Prerequisite: Admission to M.A.T.
Corequisite: HPES 611
Provides supervised observation, participation and teaching in physical education at the elementary and secondary school level.

HPES 614 Action Research Project (3)
Prerequisite: Admission to M.A.T.
Corequisite: HPES 611 and HPES 612.
Each graduate student must complete an action research project during the student teaching experience.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

HPES 618 Adapted Physical Activity (3)
Prerequisite: Major in Physical Education or related area.
A generic approach to adapting physical activity to the needs of special populations: inclusion, conditions which impede motor functioning, screening and testing practices, facilities, budgets, legal issues related to individuals with special needs.

HPES 619 Practicum: Psychomotor Assessment of Dysfunctions in Adapted Physical Activity (3)
Administration of tests of psychomotor functioning; interpretation of findings; writing the educational diagnosis; participation in multidisciplinary staffings.

HPES 620 Instructional Design in Adapted Physical Activity (3)
Prerequisite: Background in physical education and/or special education, or consent of instructor.
Designed to provide knowledge and understanding which will enable students to plan and conduct diversified programs of developmental activities, games, sports, and rhythms suited to the interests, capacities, and limitations of typical students. 3 hrs. lect; labs. arr.

HPES 621 Diagnostic/Assessment in Adapted Physical Activity (3)
Instructional intervention applied to the physical education setting; emphasis on design, implementation and evaluation of assessment tools and procedures in programs for the disabled.

HPES 625 Instructional Leadership in Physical Education (3)
A critical examination of the current knowledge base and best practices in K-12 physical education instruction, programming, assessment and professional development.

HPES 629 Introduction to Health Consultation (3)
Prerequisite: HPES 501 and HPES 503.
Study of the basic skills required for health behavior change using a health counseling approach with emphasis on the development of skills needed to design and facilitate health counseling programs.

HPES 630 Nutrition and Athletic Performance (3)
Prerequisite: College nutrition course or consent of instructor.
Principles of nutrition with special emphasis on nutrient and energy needs of athletes for optimal performance.

HPES 631 Organization & Administration of Health Education & Promotion (3)
Analysis of administrative and organizational factors of health education and promotion from within the program, within the organization, and between organizations. Emphasis will be placed on policy making, administration, and functional issues such as collaboration and consultation at the organizational level.

HPES 649 Psychological Aspects of Physical Education and Sport (3)
Analysis of the interaction among personality, motor ability, group dynamics, and environment in physical education and sports performance. 3 hrs. lect.; labs. arr.

HPES 650 Personality and Social Development in Sport (3)
Systematic study of man's behavior in sport in relation to his social environment. Emphasis on the relationship between physical activity and interpersonal competence, attitudes, personality, and aggression.

HPES 655 Current Trends and Studies in HPES (3)
Examination of current literature, research and trends in HPES.

HPES 659 Motor Control and Learning: Lab (3)
Experiments in motor learning that promote the use of basic apparatus and practical applications of research.

HPES 660 Motor Control and Learning (3)
Analysis and critical review of literature on selected topics relating to motor control and learning. Emphasis on research in the area of motor learning.

HPES 663 Sexuality Education (3)
Survey of the dynamics of family life and parenting skills. Scope of family life education, methods, source materials and current issues.

HPES 669 Administering Health Promotion and Disease Prevention Programs (3)
Prerequisite: A year of sport management or consent of instructor.
Special problems in administration of health promotion and disease prevention programs in a variety of community organizations. Program planning and organization; financing and budgeting; measuring program effectiveness; integration of health promotion and disease prevention programs and strategies with existing healthcare delivery systems.

HPES 675 Health Promotion and Disease Prevention at the Individual Level (3)
Techniques for identifying patterns of health-negative behaviors and life-style patterns on the part of an individual and health-negative circumstances in an individual's immediate environment. Development, implementation, and evaluation of person-focused changed strategies designed to eliminate, offset, and/or minimize the effects of health-negative behaviors and microenvironmental factors.

HPES 676 Community Health Promotion and Disease Prevention (3)
Analytic techniques for identifying health-negative factors in the organizational and community setting; developing, implementing, and evaluating strategic plans and programs for health promotion and disease prevention at the organizational and community level.

HPES 684 Program Planning in Health Education and Promotion (3)
Effective design, implementation, and evaluation of health instruction within the school and community setting. Emphasis on the development of sequential learning opportunities designed to meet individual and societal health needs and interests.

HPES 690 Thesis (1-6)

HPES 692 Cooperative Internship/Practicum (1-3)
Prerequisite: Completed 21 hours toward degree; completed 6 hours of HPES courses.
Supervised practical work experience in an organization or business related to the student's academic field, area of specialization, or career interest.

HPES 697 Special Topics in HPES (1-3)
Examination of one or more selected topics in the study of Health Promotion, Physical Education, and Sport Studies.

HPES 699 Directed Readings in HPES (1-3)
Prerequisite: 15 hours of graduate credit or consent of instructor.
Supervised readings and written project relating to a specific research topic in health.

History (0343-HIST)

HIST 501-502 Independent Study (3-3)

HIST 503 Advanced Studies in History (3)
Prerequisite: Consent of instructor.
Selected topics in history that cross traditional geographic or chronological boundaries.

HIST 504 Philosophy of History (3)
Note: Cross-listed with PHIL 504.
Speculations on meaning of history from ancient times to present; discussion of such contemporary issues as nature of explanation, objectivity, truth in history.

HIST 505 U.S. Cultural History: The 19th Century (3)
Prerequisite: Consent of instructor.
An analysis of artistic expression and intellectual discourses of the nineteenth century, with attention to different methodologies of cultural interpretation.

HIST 508 American Environmental History (3)
Prerequisite: Consent of instructor.
Relationship between economic development and environmental change, focusing on America, pre-Colonial to present.

HIST 510 Studies in American History (3)
Prerequisite: American History (HIST 211-212).
Intensive study of particular topic, to be announced in printed course schedule. May be repeated under different subtitles.

HIST 511 History of the Old South (3)
Prerequisite: American History (HIST 211-212) or consent of instructor.
Economic life, society, and government in the southern states from colonial times to the Civil War.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

HIST 514 U.S. Peace Movement (3)
Prerequisite: History of American Foreign Relations (HIST 314) or consent of instructor.
History of the peace movement in the United States from the beginning to the present. Examines nonviolent civil disobedience throughout U.S. history. Concentration on the twentieth century with the main focus being the Vietnam Antiwar movement.

HIST 515 American Legal History (3)
Prerequisite: American History II (HIST 212).
Surveys the role of the law and the legal profession in American history from colonial origins to the present.

HIST 516 History of American Civil Liberties (3)
Prerequisite: American History II (HIST 212).
Surveys the history of American civil rights (especially voting issues) and civil liberties (especially speech and press issues) from colonial origins to present.

HIST 517 The New Nation, 1787-1812 (3)
Prerequisite: American History I (HIST 211) or consent of instructor.
The drafting and ratification of the Constitution, establishing the national government, development of political parties, foreign policies, financial aid, and economic development.

HIST 521 Colonial America (3)
Prerequisite: American History (HIST 211) or consent of instructor.
The Colonial period, from the Jamestown settlement to the Albany Congress (1607-1754).

HIST 522 The American Revolution and the Confederation (3)
Prerequisite: American History (HIST 211) or consent of instructor.
An intensive study of the American Revolution and of the background of the Constitution.

HIST 523 The Age of Jackson: 1812-1850 (3)
Prerequisite: American History (HIST 211-212) or consent of instructor.
War of 1812, formation and development of second-party system, nationalism and sectionalism, and crises and compromises of slavery controversy.

HIST 524 United States Civil War and Reconstruction (3)
Prerequisite: American History (HIST 211-212) or consent of instructor.
Political dissolution of the 1850s; political, social, economic, constitutional, and military events of the Civil War; the Reconstruction era.

HIST 525 The United States During the Late Nineteenth Century (3)
Prerequisite: American History II (HIST 212) or consent of instructor.
An intensive study of social, economic, political, and intellectual aspects of American history from end of Reconstruction to emergence of Progressivism.

HIST 526 The Pacific War 1941-1945 (3)
Prerequisite: Consent of instructor.
World War II: the military actions, diplomacy, technology, economics and societies before and after the war in Asia and the Pacific.

HIST 527 Recent American History, 1900-1929 (3)
Prerequisite: Consent of instructor.
The interaction of political, economic, social, and intellectual forces in the shaping of foreign and domestic policy.

HIST 528 Recent American History, 1929-1945 (3)
Prerequisite: Consent of instructor.
The interaction of political, economic, social, and intellectual forces in the shaping of foreign and domestic policy.

HIST 529 Recent American History, 1945 to Present (3)
Prerequisite: Consent of instructor.
The interaction of political, economic, social, and intellectual forces in the shaping of foreign and domestic policy.

HIST 530 The U.S. and Nicaragua (3)
Prerequisite: History of American Foreign Relations (HIST 314) or consent of instructor.
Analysis of the diplomatic relations between the United States and Nicaragua, concentrating on the 20th century.

HIST 533 Twentieth-Century Latin America (3)
Prerequisite: Latin America, 1820 to Present (HIST 332) or consent of instructor.
The history of Latin America since 1900, with special emphasis upon the problems of social change and revolution.

HIST 534 The U.S. and Latin America (3)
Prerequisite: History of American Foreign Relations (HIST 314) or consent of instructor.
The history of the international relations of the United States with the nations of Latin America, emphasizing economic, political, and ideological development.

HIST 537 Black Radicalism (3)
Prerequisite: Consent of instructor.
Modern Black Nationalists, Marxists, and Black Panthers in the U.S., and their programs, ideologies, and behaviors.

HIST 538 African-American Leadership (3)
Prerequisite: Consent of instructor.
Mainstream black leaders' ideology, program and plan of action for freedom and opportunity from slavery to the present.

HIST 540 Advanced Studies in History (3)
Prerequisite: Consent of instructor.
Advanced study of a special topic; meets established guidelines for WR courses; writing and rewriting of papers throughout the term.

HIST 542 Studies in Graeco-Roman History (3)
Prerequisite: Ancient Greece (HIST 342) and The Roman World (HIST 343).
Topics to be chosen by the instructor (e.g., the Ancient Historians).

HIST 545 Studies in the Ancient Near East (3)
Prerequisite: The Ancient Near East (HIST 341) or consent of instructor.
Topics to be chosen by the instructor (e.g., social and legal institutions).

HIST 547 Studies in Russian History (3)
Prerequisite: Russian History I (HIST 363), or Russian History II (HIST 364), or consent of instructor.
Selected topics in Russian history (e.g., the early church, formation of Russian state, administration, liberalism, the purges).

HIST 551 Studies in Medieval History (3)
Prerequisite: Medieval Europe I (HIST 351), or Medieval Europe II (HIST 352), or consent of instructor.
Intensive work in selected periods of medieval history: High Middle Ages, Europe in the fourteenth and fifteenth centuries, etc.

HIST 552 Topics in Medieval History (3)
Prerequisite: Medieval Europe I (HIST 351), or Medieval Europe II (HIST 352), or consent of instructor.
Intensive study of selected topics: Makers of Europe, Consensus and Dissent in Medieval Society; cities and countryside in Medieval Europe, etc.

HIST 553 The Medieval City (3)
Prerequisite: Six hours of European history (300 or above) or consent of instructor.
Revival of urban centers following the commercial revolution and evolution of public and private structures of urban living; 1000-1500 C.E.

HIST 555 English Medieval History: 1066 to 1500 (3)
Prerequisite: Medieval Europe II (HIST 352), or English History: Roman & Medieval England to 1450 (HIST 365), or consent of instructor.
An analysis of the political, economic, and social factors contributing to the development of the English nation from the Norman Conquest to the Wars of the Roses.

HIST 560 The Great War 1914-1918 (3)
Prerequisite: Consent of instructor.
World War I: the military actions, diplomacy, technology, economics, and societies in the first total war.

HIST 561 The U.S. and Vietnam (3)
Prerequisite: History of American Foreign Relations (HIST 314) or consent of instructor.
Analysis of diplomatic relations between the United States and Vietnam, concentrating on the 20th century.

HIST 562 The Middle Eastern Wars I (3)
Prerequisite: Middle Eastern History, 600-1453 (HIST 356), The Ottoman Empire to 1800 (HIST 377), or consent of instructor.
Nomadic warriors, Turks and Mongols. Wars and military technology of Middle Eastern Gunpowder Empires. Wars of Ottoman expansion.

HIST 563 The Middle Eastern Wars II (3)
Prerequisite: Middle Eastern History, 1453 to the Present (HIST 357), The Ottoman Empire and Modern Turkey from 1800 (HIST 378), or consent of instructor.
European technological superiority and Ottoman defeat. The Austian and Ottoman wars. Balkan Wars. World War I. Turkish War of Independence.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

HIST 571 The Renaissance (3)
Prerequisite: Medieval Europe II (HIST 352) or consent of instructor.
The Italian urban powers; Hundred Years' War after 1415; Church and society on the eve of the Reformation; Italian and Northern humanism; invasion of Italy; early explorations.

HIST 572 Age of the Reformation (3)
Prerequisite: Medieval Europe II (HIST 352) or consent of instructor.
Intensive examination of causes of the Reformation, the program of the Reformers, the nature of the Roman Catholic counter-Reformation, and the character of the sixteenth century.

HIST 575 Tudor England, 1485-1603 (3)
Prerequisite: English History: Tudor Age to Welfare State (HIST 366) or consent of instructor.
Intensive study of selected aspects of the period: Humanism, Reformation, government and society, court and culture.

HIST 577 The French Revolution and Napoleon (3)
Prerequisite: 12 hours of senior college history or consent of instructor.
The Old Regime; influence of the Enlightenment; causes of the Revolution; courses and significance of the Revolution; emergence of Napoleon; rise and fall of the Empire.

HIST 578 Studies in Modern European History (3)
Prerequisite: Consent of instructor.
Intensive studies of particular topics in Modern European history. Topics will be announced in Schedule of Courses.

HIST 579 History of European Ideas: Selected Topics (3)
Prerequisite: Consent of instructor.
Selected topics on thinkers in the arts and sciences from one or more generations of European thought between the age of Charlemagne and the present. Includes the influence of ideas on their immediate society as well as on European culture and history. Topics will be announced in the Schedule of Courses.

HIST 582 Contemporary Europe Since 1945 (3)
Prerequisite: Consent of instructor.
History of Europe from the postwar era to the present.

HIST 583 Women in the Twentieth Century in Europe and the U.S. (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with WMST 531.
The history of women in Western society, including Europe and the U.S. in the twentieth century. Includes political, economic, social, and cultural developments.

HIST 585 The Third Reich (3)
Prerequisite: Europe in the Twentieth Century (HIST 382) or consent of instructor.
Survey of factors which produced the Hitler regime, and the events which spelled its demise.

HIST 587 The Russian Revolutions (3)
Prerequisite: Russian History II (HIST 364) or consent of instructor.
Intensive examination of the Russian revolutions of 1905 and 1917, their chronology, their causes, historiographical issues.

HIST 588 Feminism in Western Civilization, 1790-1920 (3)
Prerequisite: Consent of instructor.
Comparative analysis of feminist movements in United States, Britain, and Europe, stressing intellectual background, social composition, goals, and political strategies.

HIST 589 History of American Sexualities (3)
Prerequisite: Consent of instructor.
Note: Offered in conjunction with WMST 532.
Focuses on sexual behaviors and meanings in America from the Colonial period to the late twentieth century, and how sexual meanings impact on people's identities, choices, and social positions. Also concerns the interaction of gender, race, and class.

HIST 590 Studies in African History (3)
Prerequisite: Survey of Africa (PAS 270), Ancient African Civilization (HIST 393) or Formation of Modern Africa (HIST 394), or consent of instructor.
Note: Cross-listed with PAS 590.
Intensive study of a particular topic chosen by the instructor; for example, slavery and the slave trade, traditional kingdoms.

HIST 592 East Asia in Conflict (3)
Prerequisite: Japanese Business & Culture (HIST 339), Modern China (HIST 398), The Vietnam War (HIST 399), or consent of instructor.
National and international developments in the Pacific emphasizing China, Japan, Korea, and Vietnam in the twentieth century.

HIST 593 American Image of the Middle East (3)
Prerequisite: Consent of instructor.
Formation of the American image of Islam and the Middle East.
European tradition of prejudice.
Effect of religious traditions on U.S. mythologies.

HIST 594 Studies in Middle Eastern History (3)
Prerequisite: Middle Eastern History 600 to 1453 (HIST 356), or Middle Eastern History, 1453 to Present (HIST 357),
The Ottoman Empire to 1800 (HIST 377), The Ottoman Empire and Modern Turkey from 1800 (HIST 378), or consent of instructor.
Selected topics in Middle Eastern history and societies.

HIST 595 Principles of Cultural History (3)
The study of major systematic views of the development of Western culture. Credit may not be received for this course and HUM 595.

HIST 596 History of the Future (3)
Prerequisite: Consent of instructor.
A conceptual approach that presents the premise that the history of the future is, in reality, the history of the present and the past.

HIST 597 Introduction to Public History (3)
Introduction to nature, history, and methods of Public History. Emphasis on relationship of historical scholarship to nonacademic applications.

HIST 598 Introduction to Archives Administration (3)
The history, principles, and methods of administering public and private archives, records, and manuscript materials, with some practice in an archives and records program.

HIST 599 Oral History (3)
Prerequisite: Consent of instructor.
A study of the nature and development of oral sources in history, the creation and evaluation of them, and their application to research and teaching.

The following courses (excluding 603, 605, 613 and 625) may be taken for 3 credits as frequently as topics vary.

HIST 601-602 Directed Study (3-3)

HIST 603 Thesis (3)

HIST 605 Research Methods and Materials (3)
Techniques of historical research, analysis, organization, and writing; documentation; bibliographical and other research tools; use of research libraries and manuscript depositories. Experience in analysis, research, writing, and criticism.

HIST 606 Seminar in Archives Administration (3)
Prerequisite: HIST 598 or consent of instructor.
Supervised experience in an archives and records program, with emphasis upon appraisal, acquisition, arrangement, description, preservation, access, ownership, records management, legal requirements, and other problems.

HIST 607 Oral History as a Research Methodology (3)
Prerequisite: HIST 599 and consent of instructor.
Advanced applications of oral history methodology to research. Emphasis on research design, validation techniques, integration of data obtained with other sources. Applications to individual research.

HIST 608 Practicum in Public History (3)
Supervised experience in a public history setting.

HIST 611-612 Studies in American History (3-3)

HIST 613 The Teaching of History (3)

HIST 621-622 Seminar in American History (3-3)

HIST 625 History of American Education (3)
Note: Cross-listed with EDFD 625.
Examination of the function of educational processes in the context of American political, economic, and social history.

HIST 631 Studies in Latin American History (3)

HIST 641 Studies in Ancient History (3)

HIST 642 Seminar in Ancient History (3)

HIST 651 Studies in Medieval History (3)

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

HIST 652 Seminar in Medieval History (3)

HIST 661 Studies in Early Modern European History (3)

HIST 662 Seminar in Early Modern European History (3)

HIST 682 Studies in Modern European History (3)

HIST 683 Seminar in Modern European History (3)

Humanities (0348-HUM)

A wide range of approved courses are available in the Departments of English, Fine Arts, Classical and Modern Languages, Music History, Philosophy and Theatre Arts. In addition the Humanities Division offers the following courses in interdisciplinary Humanities.

HUM 501-502 Independent Study (1-3)
Prerequisite: Approval of chair.

HUM 509 Interdisciplinary Theory: Arts and Humanities (3)
Prerequisite: Consent of instructor. Methods and theories in interdisciplinary thinking and research, emphasizing (1) the interrelationships of the disciplines, (2) the importance of synthesizing art, theatre, literature, music, philosophy, and religion in a cultural context, and (3) the critical examination of issues arising from fields outside the Humanities that have significant impact on and synergy with the Humanities. Credit may not be earned for both 509 and 609.

HUM 510 Methods and Theories in the Study of Religion (3)
Prerequisite: Consent of instructor. Historical perspective on methodologies in the study of religion: normative, empirical, hermeneutical, phenomenological and post-modernist (focus on gender, race, class, pluralism). Credit may not be earned for both 510 and 610.

HUM 511 Topics in the Interpretation of Sacred Texts (3)
Prerequisite: Consent of instructor. Study in depth of sacred texts and commentaries selected from the major religions of the world: Hebrew Bible, New Testament, Qur'an, Vedas, Bhagavad Gita, and Buddhist sutras.

HUM 512 Topics in Contemporary Religious Thought (3)
Prerequisite: Consent of instructor. Study in depth of selected contemporary writers from major world religions.

HUM 513 Comparative Religion (3)
Prerequisite: Consent of instructor. A critical study of similarities and differences in ideas about and attitudes toward significant themes in world religions.

HUM 514 Colloquium: Interreligious Dialogue (3)
Prerequisite: Consent of instructor. A study of methodologies for interreligious dialogue and their application in dialogue on significant issues or themes in world religions.

HUM 550 Internship in Arts and Humanities (3)
Prerequisite: Consent of Chair of Humanities or Graduate Advisor.
Note: Course cannot be repeated for academic credit toward the degree.
An individually arranged internship combining a volunteer work experience with an Arts or Humanities organization or agency with a related academic project.

HUM 555 Independent Reading (2 or 3)
Prerequisite: Approval of chair. Readings in cultural history; oral and written reports.

HUM 561-562 Selected Topics (3-3)
Content to be indicated in the Schedule of Courses.

HUM 581 Dante (3)
Study of Dante's life and major works, and the social, political, and cultural milieu which affected his literary career.

HUM 591 Perspectives on Ancient Culture (3)
Study of fundamental aspects of ancient culture by means of individual readings and critical writing projects.

HUM 592 Perspectives on Medieval Culture (3)
Study of fundamental aspects of medieval culture by means of individual readings and critical writing projects.

HUM 593 Perspectives on Early Modern Culture (3)
Study of fundamental aspects of early modern culture (seventeenth and eighteenth centuries) by means of individual readings and critical writing projects.

HUM 594 Perspectives on Modern Culture (3)
Study of fundamental aspects of culture in the 19th and 20th centuries by means of individual readings and critical writing projects.

HUM 595 Principles of Cultural History (3)
Study of major systematic views of the development of Western culture. Credit may not be received for this course and HIST 595.

HUM 596 Seminar in Humanities (3)
Prerequisite: Consent of instructor. Content to be indicated in Schedule of Courses.

HUM 601 American Thought and Culture (3)
Introduction to history of ideas in terms of twentieth-century American thought and culture.

HUM 609 Interdisciplinary Theory: Arts and Humanities (3)
Prerequisite: Consent of instructor. Methods and theories in interdisciplinary thinking and research, emphasizing (1) the interrelationships of the disciplines, (2) the importance of synthesizing art, theatre, literature, music, philosophy, and religion in a cultural context, and (3) the critical examination of issues arising from fields outside the Humanities that have significant impact on the synergy with the Humanities. Credit may not be earned for both 509 and 609.

HUM 610 Methods and Theories in the Study of Religion (3)
Prerequisite: Consent of instructor. Historical perspective on methodologies in the study of religion: normative, empirical, hermeneutical, phenomenological and post-modernist (focus on gender, race, class, pluralism). Credit may not be earned for both 510 and 610.

HUM 645 Thesis Guidance (1-6)

HUM 650 Internship in Humanities and Civic Leadership (3-6)
Prerequisite: Approval of chair.
Note: Six credit hours are the maximum which can be credited toward the degree. Enrollment limited to students pursuing the concentraton in Humanities and Civic Leadership.
An individually arranged internship, combining a volunteer work experience in an Arts or Humanities organization or agency with a related academic project.

HUM 651-652 Independent Study (3)
Prerequisite: Approval of chair.
A research project directed by a member of the division faculty involving independent investigation, interpretation, and application, culminating in an academic research paper or directed study project report.

HUM 695 Seminar in Humanities (3)
Content to be indicated in Schedule of Courses.

Industrial Engineering (5872-IE)

IE 514 Linear Programming (3)
Prerequisite: Elementary Linear Algebra Methods in Engineering (EMCS 325).
Note: Cross-listed with EMCS 514.
Model formulation, the simplex algorithm, revised, dual and primal-dual simplex methods, transportation and assignment problems, network algorithms, and the industrial applications of linear programming.

IE 516 Operations Research II (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360) and Introduction to Operations Research (IE 415).
A selection of the probabilistic topics of operations research are included: queueing and inventory theory, renewal and Markov processes, and simulation.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

IE 522 Analysis and Design of Automated Manufacturing Systems (4)
Prerequisite:
Graduate/Professional or Graduate School standing.
The analysis and design of manufacturing systems with emphasis on computer applications.

IE 530 Industrial Safety Engineering (3)
Prerequisite: Second-year professional school standing.
Major areas are safety management, health-related aspects, and safety engineering controls. Typical topics include Kentucky OSHA, an in-plant safety program, toxicology, industrial hygiene, ergonomics, motivation, and systems analysis.

IE 535 Product Safety Engineering (3)
Prerequisite: Second-year professional school standing.
Topics include legal aspects of product liability, insurance, design, analysis, testing, and product safety in specific industries.

IE 540 Robots and Manufacturing Automation (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360).
Computer aided manufacturing; robot programming, implementation, application, and computer control; research trends; social impacts.

IE 541 Simulation (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360) and FORTRAN (ISDP 170).
The application of simulation to the analysis of systems. Topics covered include Monte Carlo techniques, sampling from and identifying stochastic distributions, methods of estimating performance measures from simulation outputs, practical applications and validation methods. Simulation languages introduced include GPSS, DYNAMO, SLAM, SIMAN.

IE 542 Control of Machines and Processes (3)
Prerequisite: Mechanics I: Statistics (CEE 205), Introduction to Electrical Engineering (EE 252), Matrix Methods for Algebraic and Differential Equations (EMCS 205), Differential Equations for Engineers (EMCS 202), Manufacturing Processes (IE 320), and consent of instructor.
Measurement, actuation, and control of industrial hardware systems; analysis and design of linear control systems; fuzzy logic control of hardware and procedural systems; control by human operators.

IE 545 Robot System Design (3)
Prerequisite: Matrix Methods for Algebraic and Differential Equations (EMCS 205), Introduction to Electrical Engineering (EE 252), and Mechanics I: Statistics (CEE 205).
Basic principles of robotics; design and analysis of robot systems that rely on computers for control and operation of manipulators and that use computers for the solution of relationship problems critical to robots.

IE 563 Experimental Design in Engineering (3)
Prerequisites: Engineering Statistics for Industrial Engineers (IE 360) or Probability and Statistics for Engineers (EMCS 360).
Note: Cross-listed with EMCS 563.
Design of engineering experiments and projects using theory of least squares, analysis of variance and covariance, randomized blocks, Latin squares, factorial experiments and associated topics. Engineering design problems using SAS and equivalent software packages.

IE 570 Engineering Design Economics (3)
Prerequisite: Second-year professional school or Graduate/Professional standing.
The quantitative aspects of economic decision making necessary for project analysis, plant design, or economic control of a functioning plant. A design project is required.

IE 573 Expert Systems for Industrial and Management Systems (3)
Prerequisite: Second-year professional school standing.
Artificial intelligence; expert systems; knowledge engineering; building & evaluating expert systems; decision support systems; integrating decision support & expert systems; real-time control systems; integrating real-time control & expert systems.

IE 575 Fuzzy Sets and Systems (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360).
Fuzzy methodologies; applications to industrial and systems engineering; directions for future research.

IE 580 Engineering Cost Analysis (3)
Prerequisite: Second-year professional school or Graduate School standing.
Methods for estimating labor costs, material costs, and overhead charges and doing product estimating, project estimating, and system estimating.

IE 590 Special Topics in Industrial Engineering (1-6)
Prerequisite: As specified by instructor.
A theoretical and/or experimental investigation of an industrial engineering design topic.

IE 599 Seminar in Industrial Engineering (1)
Prerequisite: Second-year professional school standing.
Presentation and/or discussions of topics of current interest.

IE 600 Advanced Manufacturing Methods (3)
Prerequisite: Manufacturing Processes (IE 320).
An analysis of computer-aided manufacturing dealing with parts manufacture and assembly. This course includes current applications and long-range programs along with recent advances in the automation of discrete product manufacturing.

IE 601 Computer-Aided Design and Manufacture of Plastics (3)
Prerequisite: Materials Science (CHE 253), Manufacturing Processes (IE 320), and IE 600.
Plastics properties, design of plastics products, CAD methods, process analysis tools, injection molding machines, injection mold design, automation and controls.

IE 605 Tool and Fixture Engineering (3)
Prerequisite: IE 600.
Limits, fits, tolerances accuracy; force requirements for manufacturing operations; design of cutting tools, jigs, fixtures, gages, and pallets; tooling costs.

IE 606 Production Systems and Intelligent Manufacturing (3)
Prerequisite: IE 540 & 600.
Topics include: analysis of flow lines, group technology, machine cell design, computer networking, and manufacturing automation protocol.

IE 610 Foundations of Optimization (3)
Prerequisite: Elementary Linear Algebra Methods in Engineering (EMCS 325).
Classical optimization; constrained optima; search techniques; steepest descent techniques. Calculus of variations and optimal control methods as used in engineering, economics, and systems analysis.

IE 611 Discrete Optimization (3)
Prerequisite: Introduction to Operations Research (IE 415) or EM 515.
A study of the techniques and applications of discrete optimization, especially as related to integer and dynamic programming.

IE 630 Production Planning and Control (3)
Prerequisite: Probability and Statistics for Engineers (EMCS 360) and Introduction to Operations Research (IE 415).
Forecasting; inventory management; production planning; line balancing; case studies.

IE 631 Advanced Quality Control (3)
Prerequisite: Quality Control (IE 430)
Advanced techniques for quality improvement and process control are investigated; these include advanced techniques of SPC, trouble shooting and diagnostics and Taguchi methods of experimental design.

IE 634 Case Studies in Production and Industrial Engineering (3)
Case studies illustrate the application of industrial engineering techniques to the design of production systems, the control of construction projects, and health care delivery systems.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

IE 640 Applied Systems Analysis (3)
Prerequisites: Probability & Statistics for Engineers (EMCS 360) and IE 570.
Problem formulation, data collection, alternative design generation, design evaluation, specification, and implementation for large scale systems.

IE 642 Statistical Methodology in Simulation (3)
Prerequisite: IE 541.
Discrete simulation modeling, input probability distributions, random variate generators, output data analysis, validation, variance reduction, experimental design and optimization.

IE 643 Analysis for Decision Making (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360), Introduction to Operations Research (IE 415) or EM 515.
The role of decision analysis in design; techniques for multicriteria decision analysis; systematic creativity in design.

IE 650 Material Flow Systems Design (3)
Prerequisite: IE 516
Material handling and equipment concepts; computerized plant layout; problem formulation; requirements definition; queueing; location analysis; conveyor theory; simulation; developing and evaluating alternative systems; systems implementation.

IE 651 Advanced Facilities Planning and Design (3)
Prerequisites: Facility Location and Layout (IE 321), Probability and Statistics for Engineers (EMCS 360), Introduction to Operations Research (IE 415), Operations Research II: Stochastic Models (IE 516).
Storage system and warehouse location and layout, single- and multifacility location problems, cyclic and acyclic network location models, and advance discrete location models.

IE 660 Reliability and Maintainability (3)
Prerequisite: Probability & Statistics for Engineers (EMCS 360).
Design, development, and test techniques required to assure the reliability and maintainability of new systems. Design of maintenance programs for new and existing systems.

IE 670 Advanced Engineering Economy (3)
Prerequisite: IE 570.
Inflation; cost of capital; revenue requirements; uncertainty and risk; propagation of errors; Hillier's results; simulation; capital budgeting.

IE 673 Manufacturing Decision Support Systems (3)
Application of the technologies of expert systems and simulation for manufacturing decision support and the development of intelligent decision systems.

IE 681 Human Performance (3)
Prerequisite: Human Factors Engineering (IE 480)
The effect of physical environment on human sensory, motor, and information processes. Topics include heat, noise, light, vibration, sleep loss, illness, work load, work durations, and work-rest scheduling.

IE 683 Design of Human-Machine Systems (3)
Prerequisite: Consent of instructor.
Integration of human factors into the design of complex human-machine systems with attention to the concept, development, evaluation, production, operation, and modification phases of a product life cycle. Human factors design and analysis methods including operator-oriented simulation languages, manual control theory, and experiment design applications are introduced as part of the basis for decisions at key transition points in the product life cycle. Design projects are required.

IE 685 Human Reliability (3)
Prerequisite: IE 516 and 681.
Methods for analysis and quantification of human performance; human error probability; applications to the design of new, and the redesign of existing aviation, industrial, management, and power generation systems.

IE 687 Human Aspects of Advanced Manufacturing Technology (3)
Prerequisite: IE 600 and 606, and knowledge of computerized manufacturing systems advanced automation.
Organizational, social, ergonomic and safety aspects of advanced manufacturing technology (AMT). Human side of factory automation and computer-aided design.

IE 690 M.S. Thesis in Industrial Engineering (1-6)
Prerequisite: Consent of major professor.
Research on MS thesis project. Grade shall be deferred by the major professor until evaluation of the thesis by the student's committee. Grade on pass-fail basis by the examining committee.

IE 691 Independent Research (1-6)
Prerequisite: Consent of instructor and Department Chair.
Independent Research on a problem not related to thesis or dissertation.

IE 692 Research Seminar in Industrial Engineering (1)
Prerequisite: Graduate School standing.
Reports on personal research and on current literature, with a critique of the research and of the presentation. Attendance but not course registration is required of all graduate industrial engineering majors during each semester of residence. Only 2 hours of credit may be accumulated. Graded on Pass/Fail basis.

IE 693 Independent Study in Industrial Engineering (1-6)

IE 697 M.Eng. Thesis in Industrial engineering (1-8)
A candidate for the Master of Engineering degree, specializing in the field of industrial engineering, is required to perform a study, design, or investigation under the direction of a faculty member. A written thesis is required to be presented orally and submitted to the faculty for approval.

IE 700 Dissertation Research in Industrial Engineering (1-18)
Prerequisite: Consent of major professor.
Research on dissertation project. Grade shall be deferred by the major professor until evaluation of the dissertation by the student's committee. Graded on a Pass/Fail basis by the examining committee.

Integrative Master of Business Administration (0565-IMBA)

IMBA 501 Accounting Foundations (1.5)
Prerequisite: Admission to the IMBA Program
Format of basic financial statements; transaction analysis - the effect of various transactions on the basic financial statements; interaction between financial statements; basic understanding of the financial statements; accounting cycle; and basic understanding of areas of accounting - tax, audit, management accounting, etc.

IMBA 502 Economics Foundations (1.5)
Prerequisite: Admission to the IMBA Program.
The theory and application of economic theories aimed to help students understand the real-world market interactions of individual people, companies and countries. Focuses on the understanding of the scope of economics, important economic concepts, and the application of economic tools.

IMBA 503 Finance Foundations (3)
Prerequisite: Admission to the IMBA Program
Introduces students to key fundamental language, techniques and issues in finance. Discussion on how the financial market system works, financial statements and financial ratios, time value of money concepts, and decision-making tools businesses use for determining whether or not to invest in a project.

IMBA 504 Marketing Foundations (1.5)
Prerequisite: Admission to the IMBA Program
Examines the concepts and principles involved in marketing analysis and implementation of marketing strategy in consumer, business to business, and service organizations.

IMBA 505 Team Dynamics (1.5)
Prerequisite: Admission to the IMBA Program
Explores techniques and methods of understanding individual and group behaviors in the pursuit of teamwork. Studies how teams form; functions of teams; and assessment of outcomes.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

IMBA 610 Financial Strategy (3)
Prerequisite: Completion of IMBA Foundations Courses
Examines the microeconomics of the firm and the markets in which it operates and the financial strategy that firms pursue in seeking to create value. Topics include market structure and pricing strategies, revenue forecasting techniques and translation of cash flows, capital budgeting and capital structure decisions, economics of agency, markets and hierarchies and methods of risk management.

IMBA 620 Information Technology and the Global Business Environment (3)
Prerequisite: Completion of IMBA Foundations Courses
Provides an opportunity to study the issues businesses face when operating internationally and to understand how information technologies can and are being used to compete in the global marketplace. Topics will include the culture, political, legal, economic and financial environments that businesses need to be aware of in deciding whether to expand operations beyond their own country's borders. Course will pay particular attention to the role that information technology plays in these decisions and the problems that arise in managing information technology in a firm that operates internationally.

IMBA 630 Developing High Performance Systems (3)
Prerequisite: Completion of IMBA Foundations Courses
Transformation of the modern organization through the development of high performance systems employing leading-edge human resource practices. Utilizing a "systems" focus and integrating theories drawn from "micro" and "macro" levels of analysis, this module examines the human resource practices of both successful and marginal organizations.

IMBA 640 Integrative Operations Strategy (9)
Prerequisite: Completion of IMBA Foundations Courses
Presents in an organized manner, a comprehensive, integrated treatment of the fields of operations management, cost management and marketing management. Selectively examines the "common body of knowledge" in these areas and then embarks on new overall management philosophies i.e., The Theory of Constraints (TOC) and Activity Based Cost Management (ABCM).

IMBA 651 Lifelong Learning I (1)
Prerequisite: Completion of IMBA Foundations Courses
Explores the reasons for success and failure in the work environment, career planning, and the development of the IMBA portfolio. Design working resume to accurately communicate aspirations, skills, experience, and achievements.

IMBA 652 Lifelong Learning II (1)
Prerequisite: Completion of IMBA Foundations Courses
Explores ongoing activities necessary to continually have value-added skills for the workforce. Each participant will develop a final course resume and a two-year learning plan with specific objectives, outcomes, and expectations.

Interdisciplinary Graduate (2650-GS)

GS 683 College Teaching (3)
Note: Cross-listed with EDAD 683.
Analysis of the elements of effective college teaching; observation and evaluation of teaching; opportunities for microteaching; and investigation of rights and responsibilities of faculty members.

GS 699 Interdisciplinary Research (1-12)
Prerequisite: Major in Interdisciplinary Studies.

Justice Administration (0354-JA)

JA 576 Managing Organizational Performance (3)
Examination of factors affecting the management of organizational performance. Designed to help participants develop conceptual diagnostic and problem solving skills required of strategic managers in contemporary law enforcement organizations.

JA 596 Seminar in Criminal Justice (3)
An interdisciplinary seminar. Focuses on issues pertinent to the criminal justice system that reflect conflicting perspectives.

JA 602 History of Police in the United States (3)
A study of the historical development of police agencies in the United States. The origin and influence of various European concepts of law enforcement and how they relate to past and present ideas in the United States. An ideological rather than an institutional approach is assumed.

JA 603 Criminal Justice System Planning (3)
The application of planning and program evaluation concepts and techniques to the development of comprehensive justice system programs. The integration of the activities of police, judicial and correctional agencies into meaningful crime reduction plans.

JA 605 Police in Our Political and Social Systems (3)
An examination of the police function as a component of the political system in the United States. The manner in which police give substance to the political system and are formed by it in turn. The interaction of the police with other governmental institutions in the political system.

JA 606 Personnel Management in the Criminal Justice System (3)
Focus is on contemporary personnel management problems confronting agencies in the criminal justice system. Both the historical and the theoretical developments of personnel management are analyzed. Alternatives to current management procedures and systems are presented.

JA 609 Economic Analysis of Crime (3)
A study of the economic scope of crime. The role of illegal gambling, loan sharking, labor racketeering, and legitimate business infiltration. The cost of crimes against property. The economic characteristic of high crime jurisdictions. Preventive programs and their costs.

JA 610 Theoretical Foundation of Corrections (3)
A study of the psychological, sociological, political, and economic factors which contributed to the concept of corrections. The evolution of correctional thought and its role in contemporary and future reforms.

JA 611 Criminal Justice Administration: Corrections (3)
Examines the origins and current practices in the management of correctional programs. Emphasis will be placed on establishing and evaluating new techniques in correctional management and administration.

JA 612 Criminal Justice Administration: Police (3)
An examination of the functions of police in society; principles of law enforcement organizations, administration, policy formulation, and management of personnel; statutory limitations on authority and jurisdiction.

JA 613 Comparative Policing Systems (3)
An evaluative comprehensive examination of policing systems around the world. History, styles of enforcement and special issues are included.

JA 621 The Criminal Justice System (3)
A study of the criminal justice system in the United States. A systems approach to the study of criminal justice and the interrelationships of the various components of the system. Social and political issues related to the criminal justice system are examined in depth.

JA 625 Legal Aspects of Criminal Justice Management (3)
Examination of the legal issues within criminal justice management, the effects of constitutional provisions, statutes, ordinances, and judicial decisions on justice administration. A discussion of the legal aspects of selection, promotion, assignment, and termination of justice employees.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

JA 640 Seminar in Crime Prevention and Social Control (3)
Prerequisite: Consent of instructor.
Study of the concept and principles involved in preventing crime and maintaining positive social controls. Focus will be on the role of criminal justice agencies in initiating and implementing programs.

JA 641 Advanced Criminal Behavior: Treatment (3)
A study of the interaction between social institutions and law violators. An analysis of the concepts of behavioral control, law, normal behavior, deviance, crime and the relationships between criminals and victims.

JA 643 Theories of Crime and Delinquency (3)
A study of the psychological and sociological factors involved in criminal and delinquent behavior. The relationship of theory to the prevention and control of crime, treatment of offenders and administration of respective criminal justice agencies.

JA 644 Seminar in Juvenile Justice (3)
Theoretical and empirical study of the etiology, distribution and extent of delinquency; problems involved in measuring delinquency; role of the police, courts and legal statutes; critical examination of treatment and prevention programs.

JA 648 Seminar in Criminal Justice Program Evaluation (3)
Application of social scientific research methods to determine the effectiveness of criminal justice programs. Analysis of reports of evaluative research. Preparation and analysis of evaluation research reports.

JA 649 Applied Statistics in Criminal Justice (3)
Focuses on the use of statistical techniques in criminal justice. Emphasis on the application and interpretation of the statistics. Utilization of statistical application computer systems.

JA 650 Research Methods (3)
The application of quantitative and qualitative analyses in criminal justice research. The concepts of validity, hypothesis, reliability, measurement, sampling, quasi-experimental construction, errors in reasoning, and statistics and approaches to the problems of the conduct of stringent and useful research.

JA 651 Computer Applications in Criminal Justice (3)
Focuses on the use of computer software and hardware in criminal justice agencies. Explores various statistical, analytical, and mathematical applications of automation for police, courts and corrections. Emphasis on applied projects.

JA 665 Special Topics in Justice and Criminology (3)
Study of contemporary issues concerning the philosophy, management, and operations of criminal justice agencies.

JA 670 Directed Studies/Readings (3)
Prerequisite: Consent of chair and instructor.
Independent study or research project under the direction of a member of the faculty.

JA 690 Practicum (1-6)
Prerequisite: Consent of chair.
To practice and to conduct research in a criminal justice or supporting agency under both professional and academic supervisors.

JA 698 Professional Paper (3)
Prerequisite: Consent of chair.
Preparation of a paper of publishable quality based on research under the direction of a faculty member.

JA 699 Thesis (1-6)
Prerequisite: Consent of chair.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Linguistics (0359-LING)

LING 518 Foundations of Language (3)
Note: Cross-listed with ENGL 518.
A survey of contemporary theories of language from structuralism to transformational grammar; the relationship of linguistics to literature, psychology, philosophy, reading, and sociology.

LING 524 Psycholinguistics (3)
Prerequisite: LING/ENGL 518 or Language & Cognition (PSYC 324).
Note: Cross-listed with PSYC 524.
Psychological aspects of language and their significance for analysis and understanding of cognitive and social processes.

LING 535 Applied Linguistics for English Teachers (3)
Prerequisite: Intermediate College Writing (ENGL 102) or Advanced Composition for Freshmen (ENGL 105).
Note: Cross-listed with ENGL 535.
Applied linguistics and its application to an understanding of speaking, listening, reading, and writing processes.

LING 590 Special Topics in Linguistics (3)
Prerequisite: LING/ENGL 518.
Intensive investigation of selected topics in current linguistic theory or practice.

LING 600 Independent Study (1-3)
Prerequisite: 12 graduate hours in linguistics, including 518.
Guided independent study in depth of a topic in current linguistic theory or practice. Independent Study Proposal form must be approved before registration; see Director of program.

LING 603 Theories of Grammar (3)
Prerequisite: LING/ENGL 518.
Critical review of recent and current theoretical approaches to syntax and semantics. Focus on revisions of Chomsky's extended standard theory and emerging theories, and will survey contributions made by other approaches.

LING 606 Historical and Comparative Linguistics (3)
Prerequisite: LING/ENGL 518 and LING 520.
A historical study of phonological, morphological, and semantic changes in language through the comparative method and internal reconstruction; recent trends in diachronic linguistics.

LING 620 Phonetics and Phonology (3)
Prerequisite: LING/ENGL 518 or consent of instructor.
An introduction to phonetics and phonological theory; study of the nature and organization of sound in language.

LING 621 Sociolinguistics (3)
Prerequisite: LING/ENGL 518 or consent of instructor.
Note: Cross-listed with ENGL 621.
The nature of language in social context, presented within the theoretical framework of generative grammar.

LING 624 Language and Cognition (3)
Prerequisite: LING/ENGL 518 or consent of instructor.
Note: Cross-listed with PSYC 624.
Examination of the theory and research on the relationship between fundamental processes or cognition and linguistics processes, e.g., organization of thought, memory, discourse, and text.

LING 630 Language and Culture (3)
Prerequisite: Introduction to Linguistics (LING 302/ENGL 325) or Foundations of Language (LING/ENGL 518).
Introduction to the study of language and speaking as part of daily social life, viewed from an ethnographic perspective.

LING 641 Recent Philosophy of Language (3)
Prerequisite: LING/ENGL 518 or consent of instructor.
Note: Cross-listed PHIL 641.
Intensive study of current theory and research in the Philosophy of language.

LING 690 Seminar in Linguistics (3)
Prerequisite: Introduction to Linguistics (LING 302/ENGL 325) or (LING/ENGL 518).
Cross-listed with ENGL 682.
Selected topics in applied or theoretical linguistics.

LING 699 Thesis (3-6)

Management (0568-MGMT)

MGMT 501 Managerial Statistics (3)
Prerequisite: Intermediate algebra and calculus; fulfills a Foundation Core requirement only.
Note: Cross-listed with PADM 501.
A survey study of statistics, regression, ANOVA, and forecasting.

MGMT 600 Advanced Organizational Behavior (3)
Examination of the concepts and theories from the behavioral sciences which explains human behavior within organizations. The major focus is on individual behavior and group dynamics with special emphasis on techniques and methods to improve individual functioning and interpersonal processes.

MGMT 601 The Business Environment (3)
Examines the interactions between organizations and their demographic, legal, technological, social, political, and ethical environments. The major object is to construct a conceptual framework suited to helping managers develop policies and programs that will bring their organizations into congruence with the societies they must serve. The environment of multinational business is also discussed.

MGMT 607 Advanced Business Statistics (3)
Prerequisite: MGMT 501 and matrix algebra.
Four major statistical techniques, analysis of variance, linear regression, multiple regression, and forecasting, will be studied in detail, plus other special topics as time permits. Within each topic attention will be given to the model and its assumptions, the analysis, and applications to business problems. Packaged computer programs will be relied on to facilitate the analysis.

MGMT 610 Production/Operations Management (3)
Prerequisite: MGMT 501, CIS 500, and calculus.
This course covers the broad aspects of production and operations management, including both the quantitative and qualitative points of view.

MGMT 615 Seminar in Quantitative Methods (3)
Prerequisite: MGMT 501.
Mathematical modeling building for the quantitative analysis and optimization of business decisions. Advanced applications in the areas of inventory control, production scheduling, mathematical programming, simulation, and queueing theory and related topics. Not regularly offered.

MGMT 620 Human Resources Management (3)
This course provides an opportunity for students to develop comprehensive understanding of personnel practices and policies. The main objective is to learn how to develop optimum personnel programs within the business organization. Actual cases are studied, giving the student a realistic understanding of the methods and techniques used in administering a sound personnel.

MGMT 630 Labor-Management Relations (3)
A study of labor-management issues with emphasis on (1) the organizing stage, (2) problems in the shop, (3) problems at the bargaining table, (4) labor relations and public policy, and (5) an examination of labor relations overseas. These issues are examined through the intensive analysis of factual descriptions. Students are provided with the opportunity to participate in role playing, prepare arguments, and make decisions.

MGMT 640 Organizational Change and Development (3)
Prerequisite: MGMT 600.
Examination of theories and methods utilized to promote purposeful change in organizational systems and processes. Emphasis placed on organizational development for improving organizational effectiveness. Topics will include team building and survey feedback.

MGMT 645 Small Business Counseling (3)
Prerequisite: Undergraduate business degree, or having completed ACCT 500, MKT 500 and FIN 500.
The students, working in two-person teams, will assist a small business in addressing some key business needs or problems. As a counselor/consultant, the student seeks to identify the causes of the problems and offer recommendations. This is a field research course, with guidance and support from the Small Business Institute Director.

MGMT 650 Organizational Structure and Design (3)
Prerequisite: MGMT 600.
Examination of concepts concerning the structures and processes utilized by organizations in managing internal systems and environmental interactions. Topics include information systems, organizational design, and strategic planning as they impact organizational effectiveness.

MGMT 660 Leadership (3)
Provides an experiential approach to leadership effectiveness. Discussions focus on a variety of classical and contemporary readings applicable to leadership. Self-knowledge, analytical skills, and innovation characterize case studies and meetings with men and women in leadership roles. Special emphasis is placed upon communication skills and ethical issues in leadership.

MGMT 680 Special Topics in Management (1-6)
An advanced study of one or more selected topics or issues related to the study of Management.

MGMT 684 Managing Creativity and Innovation (3)
A broad overview of innovation, and the managerial decisions that affect innovation performance. Places innovation in its social, economic, technological, and political context.

MGMT 685 New Venture Creation (3)
Prerequisite: Concurrent with MGMT 686.
Study of the activities associated with the creation, assessment, development, and operation of new and emerging ventures. Students will develop new venture management skills through a combination of classroom exercises, case analysis, and the development of a business plan to support the initiation of a new venture.

MGMT 686 Business Plan Development (3)
Prerequisite: Concurrent with MGMT 685.
Development of a complete business plan for the creation of a new venture.

MGMT 687 New Venture Finance (3)
Prerequisite: MGMT 685.
Organization and presentation of financing plans for new ventures; securing financial support.

MGMT 689 New Venture Implementation (6)
Prerequisite: Successful completion of all IMBA modules and enrollment. Current enrollment in Integrative Global Strategy and Lifelong Learning II.
Exploration of topics necessary for the successful implementation of new venture opportunities upon completion of a new venture plan.

MGMT 690 Corporate Entrepreneurship and Global Strategy (3)
Prerequisite: To be taken in student's final semester.
The interdisciplinary nature of the general management of organizations is studied in context through the use of case studies and/or computer simulation.

MGMT 698 Research Seminar in Management (1-3)
Prerequisite: One 600-level management course and permission of departmental chair.

Marketing (0577-MKT)

MKT 500 Marketing Concepts (1.5)
Note: Fulfills a Foundation Core requirement only.
In-depth study of marketing concepts and the elements of the marketing mix. Coverage of legal, social, and international aspects of marketing as they affect the firm.

MKT 600 Marketing Management (3)
Prerequisite: MKT 500.
Examines the concepts and principles involved in marketing analysis and implementation of marketing strategy in consumer, industrial, and service organization. Includes material on social forces and international aspects under various topic areas.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

MKT 610 Consumer Behavior (3)
Prerequisite: MKT 600, or undergraduate major in marketing. Information from the behavioral and quantitative sciences which relates to consumer behavior. Presents economic, psychological, communications, and cultural information and research findings which attempt to describe the morphology and structure of consumer behavior.

MKT 620 Marketing Research (3)
Prerequisite: MKT 600, or undergraduate major in marketing. An application of behavioral and quantitative information to the problems of determining consumer-based behavioral decisions. Topics included are research design, research methodology, and the application of research findings to marketing problems.

MKT 630 Sales Management (3)
Prerequisite: MKT 600, or undergraduate major in marketing. A managerial decision course involving sales planning and operations based upon marketing information provided by marketing researchers. An integrative course concentrating on planning and execution of sales and promotional activities.

MKT 650 International Business (3)
Prerequisite: MGMT 601.
An interdisciplinary business course that provides perspectives on the importance of the global nature of business operations. Topics include managerial decision making in forecasting, marketing, finance, accounting, production, sourcing, human resources, and global strategy in an international environment.

MKT 670 International Marketing (3)
Prerequisite: MKT 600, or undergraduate major in marketing. An integrated approach to international marketing management which stresses the political, cultural, technical, and economic similarities and differences of countries and regions. Emphasizes the development of international marketing strategies by the multinational corporation.

MKT 680 Special Topics in Marketing (1-6)
An advanced study of one or more selected topics or issues related to the study of Marketing.

MKT 690 Marketing Policies and Planning (3)
Prerequisite: MKT 600, or undergraduate major in marketing. An integrative capstone course for marketing managers which includes information relevant to consumer behavior, marketing research, and quantifiable marketing information.

MKT 695 Marketing Seminar (3)
A flexible course which will from time to time include the following topics: Marketing Theory, Logistics of Distribution, Government and Trade Regulation, Product Planning and Development, Advertising, Communications, and Quantitative Aspects of Marketing.

MKT 698 Research Seminar in Marketing (1-3)
Prerequisite: One 600-level marketing course and permission of departmental chair.

MATHEMATICS (0360-MATH)

The * designates courses that are essentially the same as similarly titled courses offered by the Department of Engineering Mathematics and Computer Science in the Speed Scientific School. Refer to those pages and consult your advisor about registration in these courses. Approval of the Department of Mathematics is required before such courses can be applied toward a degree in mathematics.

MATH 501 Introduction to Analysis I (3)
Prerequisite: Calculus III (MATH 301) and Introduction to Linear Algebra (MATH 325), or consent of department.
Introduction to the basic concepts of real analysis. Sequences, limits, continuity, and differentiation and integration of functions of one variable.

MATH 502 Introduction to Analysis II (3)
Prerequisite: MATH 501.
Convergence of sequences and series of numbers and functions; calculus of functions of several variables.

MATH 505 Introduction to Partial Differential Equations (3)
Prerequisite: Calculus III (MATH 301) and Differential Equations (MATH 405).
Techniques for solving standard heat, wave, and potential equations, including discussion of Fourier analysis techniques.

MATH 507 Fourier Series (3)
Prerequisite: Calculus III (MATH 301) and Differential Equations (MATH 405).
A study of expansion in trigonometric and other orthogonal systems of functions. Offered as needed.

MATH 508 Advanced Numerical Methods (3)
Prerequisite: Numerical Analysis (MATH 407) or consent of instructor.
Numerical methods associated with matrices (including Eigenvalues and Eigenvectors); function approximation, splines and partial differential equations.

MATH 511 Complex Analysis (3)*
Prerequisites: Calculus III (MATH 301) or consent of instructor.
Note: Credit may be applied towards the M.A.T. degree only.
Introduction to theory of analytic functions, including integration, series, residues, conformal mapping, and analytic continuation.

MATH 520 Theory of Numbers (3)
Prerequisite: Calculus I & II (MATH 205-206) and Introduction to Linear Algebra (MATH 325), or consent of instructor.
Note: Credit may be applied towards the M.A.T. degree only.
A study of the integers and their divisibility properties. Particular emphasis on the theory of congruencies, partitions, prime numbers, Diophantine analysis and quadratic residues. Offered as needed.

MATH 521 Modern Algebra I (3)
Prerequisite: Calculus I & II (MATH 205-206) and Introduction to Linear Algebra (MATH 325), or consent of instructor.
An introduction to the theory of groups, rings, integral domains, and fields. Fall.

MATH 522 Modern Algebra II (3)
Prerequisite: MATH 521.
Continuation in greater depth of topics introduced in MATH 521; introduction to theory of ideals, field extensions, and abstract vector speces. Spring.

MATH 530 Matrix Analysis (3)
Prerequisite: Calculus I & II (MATH 205-206) and Introduction to Linear Algebra (MATH 325), or consent of instructor.
Matrix norms, eigenvalues and eigenvectors, matrix decompositions, and canonical forms. Applications and computational considerations discussed.

MATH 535 Modeling I (3)
Prerequisites: Differential Equations (MATH 405) and Discrete Mathematics (MATH 387) or consent of instructor.
Examination of continuous and discrete modeling. Formulation, analysis and use of various models, including optimization and dynamic techniques.

MATH 536 Modeling II (3)
Prerequisite: MATH 535.
Continuation of MATH 535. Additional topics include probabilistic methods.

MATH 541 Elementary Topology (3)
Prerequisite: Calculus III (MATH 301) and Introduction to Linear Algebra (MATH 325) or consent of instructor.
A study of continuity in the setting of metric spaces and topological spaces.

MATH 545 Introduction to Fractal Geometry (3)
Prerequisites: Calculus III (MATH 301) and Introduction to Linear Algebra (MATH 325); MATH 501 recommended.
Recursively defined sets and self-similarity; metric spaces and iterated function systems; topological, fractal, and Hausdorff dimensions.

MATH 550 Advanced Euclidean Geometry (3)
Prerequisite: A year of high-school geometry or Modern Geometry (MATH 155), Calculus I & II (MATH 205-206), and Introduction to Linear Algebra (MATH 325), or consent of instructor.
Note: Credit may be applied toward the M.A.T. degree only
Theory of Euclidean geometry contrasted with non-Euclidean from both the axiomatic and algebraic approach. Of special value to secondary teachers.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

MATH 551 Geometry (3)
Prerequisite: a year of high-school geometry or Modern Geometry (MATH 155), Calculus I & II (MATH 205-206), and Introduction to Linear Algebra (MATH 325), or consent of instructor.
Study of projective spaces, transformations and invariants. Introduction to related geometries, such as affine, elliptic, and hyperbolic.

MATH 555 Mathematical Logic (3)
Prerequisite: Calculus I & II (MATH 205-206) and Introduction to Linear Algebra (MATH 325), or consent of instructor.
Informal development of sentential and general rules of inference, and an axiomatic development of the propositional calculus. Emphasis on the study of the nature of proof; consistency, independence, and deductive completeness of axioms; mathematical models.

MATH 560 Statistical Data Analysis (3)
Prerequisite: Calculus I (MATH 205).
Note: Credit may be applied towards the M.A.T. degree only.
Descriptive techniques, inferential techniques, simple and multiple linear regression. Frequent use of statistical computer packages. No previous knowledge of the computer required.

MATH 561 Probability (3)*
Prerequisite: Calculus I, II & III (MATH 205-206, 301).
Probability spaces, probability distributions, moments, moment-generating functions, independence, transformation of variables, sampling distributions, laws of large numbers, central limit theorem, applications. Fall.

MATH 562 Mathematical Statistics (3)*
Prerequisite: MATH 561.
Random samples and statistics, point estimation, sufficiency and completeness, confidence regions, classical theory of hypothesis testing, linear regression, nonclassical procedures. Spring.

MATH 564 Probability Models (3)
Prerequisite: MATH 561.
Finite probability models, Markov chains, renewal and reliability theory, Brownian motion, stochastic differential equations. Offered as needed.

MATH 566 Nonparametric Statistical Methods (3)
Prerequisite: MATH 561.
Rank tests for comparing two or more treatments or attributes, the one-sample problem, tests of randomness and independence, nonparametric estimation, graphic methods, and computer programs. Offered as needed.

MATH 567 Sampling Techniques (3)
Prerequisite: MATH 560 or 561.
Random, systematic, stratified, and cluster sampling techniques. Ratio and proportion estimates. Sample size and strata determination. Offered as needed.

MATH 570 Actuarial Review 2 (1.5)
Prerequisite: MATH 562.
Intensive preparation for the second actuarial exam of the Society of Actuaries.

MATH 572 Applied Statistical Methods for Actuaries (3)
Prerequisite: MATH 562.
Theory and problem solving techniques of analysis of variance, regression analysis, and time series analysis.

MATH 573 Operations Research for Actuaries (1.5)
Prerequisite: Introduction to Operations Research (IE 415).
Theory and problem solving techniques in operations research, including linear and dynamic programming, queueing theory, decision analysis, and stochastic simulation.

MATH 574 Numerical Methods for Actuaries (1.5)
Prerequisite: Numerical Analysis (MATH 407).
Advanced theory and problem solving techniques in numerical analysis, including iteration and interpolation techniques, numerical integration, and solution of linear systems.

MATH 576 Theory of Interest (3)
Prerequisite: Calculus III (MATH 301).
Compound interest, annuities-certain, equations of value, and related topics of the Society of Actuaries mathematics of compound interest exam.

MATH 577 Actuarial Mathematics I (3)
Prerequisites: Calculus III (MATH 301) and MATH 561.
Introduction to actuarial mathematics. Economic basis of insurance. Random variables studied in insurance theory. Mathematical finance as applied to actuarial science -- compound interest, annuities, valuation of bonds and other securities. Introduction to life insurance.

MATH 578 Actuarial Mathematics II (3)
Prerequisite: MATH 577.
Further topics in actuarial mathematics. Mathematics of life insurance: life contingencies, premiums, reserves. Multiple life contingencies. Introduction to pension plan valuation. Collective risk models, and risk theory. Insurance models including expenses and nonforfeiture values.

MATH 580 Applied Graph Theory (3)
Prerequisite: Calculus I & II (MATH 205-206) and Introduction to Linear Algebra (MATH 325), or consent of instructor.
Note: Credit may be applied towards the M.A.T. degree only.
Graphs, directed graphs, signed graphs, intersection graphs, and weighted digraphs with applications in psychology, communications, scheduling, ecology, economics, and education. Fall.

MATH 581 Introduction to Graph Theory (3)
Prerequisite: Calculus I & II (MATH 205-206) and Introduction to Linear Algebra (MATH 325), or consent of instructor.
Provides an overview of graph theory. Topics include blocks, trees, connectivity, Hamiltonian and Eulerian graphs; topological problems, matrices and groups. Spring.

MATH 585 Mathematics for Behavioral and Social Sciences (3)
Prerequisite: Calculus I & II (MATH 205-206) and Introduction to Linear Algebra (MATH 325), or consent of instructor.
Modeling through games and choice, measurement and scaling, graphs, similarity and preference, Markov models, stochastic processes, dynamic social systems, ecosystems, catastrophe and stability theories.

MATH 590 History of Mathematics (3)
Prerequisite: 500-level course in math (except 560).
Mathematical history from Mesopotamia to present. Emphasis on doing mathematics, identifying the growth of mathematical concepts and studying prominent mathematicians.

MATH 591 Selected Topics in Mathematics (1-3)
Prerequisite: Announced in Schedule of Courses.
An examination of one or more topics in mathematics not usually treated in a regularly offered course.

MATH 601 Real Analysis I (3)
Prerequisite: MATH 502
Basic set theory and real topology, Lebesgue measure and integration on the real line, differentiation of integrals, L(p) spaces.

MATH 602 Real Analysis II (3)
Prerequisite: MATH 601
Elementary Halberd space theory, abstract measure spaces and integration, product spaces. Applications to other areas.

MATH 605 Functional Equations I (3)
Prerequisite: MATH 601
Introduction to the theory and application of functional equations in several variables, including Cauchy equations, d'Alembert equation, quadratic functionals.

MATH 606 Functional Equations II (3)
Prerequisite: MATH 605 or consent of department.
Continuation of Mathematics 605. It extends further the theory of functional equations to applications in various branches of mathematics, information theory, and the natural and social sciences.

MATH 607 Seminar on Applied Analysis (3)
Prerequisite: MATH 605 or consent of department.
Advanced topics in applied analysis. Topics will be determined by the research interests of the students and those of the instructor.

MATH 611 Complex Variables I (3)
Prerequisite: MATH 502.
Geometry of the complex plane and complex analysis. Topics include analytic and meromorphic functions, linear fractional transformations, Cauchy's Theorem and the Residue Theorem.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

MATH 612 Complex Variables II (3)
Prerequisite: MATH 611.
A continuation of MATH 611, including deeper properties of the space of meromorphic functions, harmonic functions and conformal mappings.

MATH 621 Algebra I (3)
Prerequisite: MATH 522.
Advanced theory of Groups, Rings, Integral Domains and Fields.

MATH 622 Algebra II (3)
Prerequisite: MATH 621.
A continuation of MATH 621, including Polynomial Rings, Modules, Vector Spaces, Structure of Fields, Galois Theory, Advanced Linear Algebra.

MATH 631 Group Theory (3)
Prerequisite: MATH 522.
Abstract Groups, Homomorphisms, Permutation Groups, Abelian Groups, Simple Groups, Sylow Theory, Series, Extensions.

MATH 633 Rings and Ideals (3)
Prerequisite: MATH 522.
Ideals and Homomorphisms, Prime Ideals and the Prime Radical, Rings of Endomorphisms, the Jacobson Radical.

MATH 641 Topology I (3)
Prerequisite: MATH 502 or MATH 541
Continuous functions, connectedness, compactness, countability, separation, metrizability, and completeness in the context of topological spaces.

MATH 642 Topology II (3)
Prerequisite: MATH 641
A continuation of MATH 641; introduction to algebraic topology, including the Fundamental Group and Covering Spaces.

MATH 660 Probability Theory (3)
Prerequisite: MATH 501 and MATH 561 or consent of department.
A measure-theoretic approach to topics in probability theory; conditional probability, conditioned expectation, types of convergence, strong law of large numbers, characteristic functions, and the central limit theorem. Offered as needed.

MATH 662 Advanced Mathematical Statistics (3)
Prerequisite: MATH 562 or consent of department.
Classical theory of statistical inference, asymptotic theory and robustness, Bayesian inference, and statistical decision theory.

MATH 665 Advanced Linear Statistical Models (3)
Prerequisite: MATH 562 (may be taken concurrently) and a semester of linear algebra or MATH 530.
Distribution of quadratic forms, estimation and hypothesis testing in the general linear model, special linear models, applications.

MATH 676 Actuarial Mathematics (3)
Prerequisite: MATH 572 & 576.
Survival distribution, life tables, net premiums, reserves, and related topics of the Society of Actuaries Actuarial Mathematics.

MATH 681 Combinatorics and Graph Theory I (3)
Prerequisite: MATH 521 or MATH 580 or MATH 581 or consent of department.
Fundamental topics in Graph Theory and Combinatorics through Ramsey theory and Polya's theorem respectively. Motivation will be through appropriate applications.

MATH 682 Combinatorics and Graph Theory II (3)
Prerequisite: MATH 681.
Fundamental topics in Graph Theory and Combinatorics through Ramsey theory and Polya's theorem respectively. Motivation will be through appropriate applications.

MATH 683 Advanced Combinatorics and Graph Theory I (3)
Prerequisite: MATH 681
Advanced topics in Combinatorics and Graph Theory, including finite planes, coding theory, combinatorial optimization, groups, graphs, and graphs on manifolds.

MATH 684 Advanced Combinatorics and Graph Theory II (3)
Prerequisite: MATH 681 and 682
Course extends the study of advanced topics in Combinatorics and Graph Theory, including Extremal Graph Theory and Algebraic Combinatoris.

MATH 687 Seminar on Discrete Mathematics (3)
Prerequisite: MATH 683 or consent of department.
Advanced topics in discrete mathematics.

MATH 690 An Overview of Mathematics (3)
Prerequisite: Undergraduate mathematics major or at least four mathematics courses in the graduate program or consent of instructor.
History of mathematics, survey of the major content areas of modern mathematics, discernment of current directions in various mathematical fields.

MATH 691 Independent Study (3)

MATH 693 Seminar in Teaching Mathematics (1-3)
Prerequisite: Consent of instructor.
Selected topics of interest to teachers of mathematics. May be repeated once for credit. Does not count as part of 18-hour minimum in mathematics for M.A.

MATH 695 Thesis Guidance (1-6)

MATH 696 Computer in Teaching Science and Mathematics (3)
Prerequisite: One year of teaching experience or consent of instructor (no previous computer experience needed).
Introductory programming and use of computers in a wide range of topics in secondary school science and mathematics. Does not count as part of 15-hour minimum in 600 level mathematics courses for M.A.

MATH 699 Seminar (1-12)

Mechanical Engineering (5884-ME)

ME 510 Internal Combustion Engines (3)
Prerequisite: Thermodynamics II (ME 310).
Basic design and analysis of spark ignition, compression ignition, and gas turbine engines. Gas flow processes and combustion processes. Engine modeling and performance prediction. Emission control systems.

ME 512 Finite Element Methods for Mechanical Design I (3)
Prerequisite: Intermediate Mechanics of Materials (ME 432).
Matrix analysis of static and dynamic structural systems and steady state heat transfer. Computer aided design of trusses, frames, plane stress structures, and 1-D and 2-D thermal systems including conduction and convection.

ME 520 Robotic Manipulator Design and Analysis (3)
Prerequisite: Robotics (ME 410).
Review of kinematics, statics, and dynamics of mechanical linkages; design and analysis of mechanical structures, actuators/transmissions, and sensors. Control systems design; trajectory control, force control, adaptive and optimal control. Emphasizes applications in manufacturing processes.

ME 523 Intermediate Dynamics (3)
Prerequisite: Mechanics II: Dynamics (ME 206) and Systems Dynamics (ME 435)
Extension of the dynamics concepts introduced in ME 206. Utilization of rotational coordinate systems and vector dynamics in 3-dimensional motion. LaGrangian analytical methods. Stability of motion. Computer methods for dynamic modeling. Emphasis on design modifications and evaluation using C.A.E. software.

ME 525 Internal Combustion Design (3)
Prerequisite: Machine Design I (ME 422).
Mechanical design of internal combustion engine components and systems for strength, endurance, and optimum performance. Design projects, computer applications.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

ME 528 Control Systems Designs (3)
Prerequisite: Mechanical Vibrations (ME 421).
Basic concepts of automatic feedback control systems. Formulation of the linear control problem by classical and state variable methods. Frequency response and root locus analysis and synthesis techniques. General linear stability and Nyquist criteria. System performance specifications and sensitivity studies.

ME 530 Advanced Mechanical Design (3)
Prerequisite: Consent of instructor.
Application of classical, computational, and experimental methods and analyses to the design of mechanical systems. Topics include component design and analysis, failure analysis, and optimization, with emphasis on computer applications.

ME 531 Analysis and Design of Energy Systems (3)
Prerequisite: Consent of instructor.
Application of classical computational, and experimental methods and analyses to the design of mechanical energy systems. Topics include design and analysis of static and transient thermal, fluid, electromechanical, and acoustic systems.

ME 540 Turbomachinery (3)
Prerequisite: Thermo-dynamics II (ME 310) and Fluid Mechanics II (ME 401).
The thermodynamics and fluid mechanics of turbomachinery. Dimensional analysis and performance mapping. Blading and flow field analysis. Experimental and theoretical methods for determination of flow losses. Characteristics of axial and radial flow turbines, compressors and pumps.

ME 545 Tribology (3)
Prerequisite: Fluid Mechanics II (ME 401) and Heat Transfer (ME 440).
Hydraulic and boundary lubrication, static and dynamic characteristics of gas and liquid journal bearings, and numerical analysis of bearing problems.

ME 552 Direct Energy Conversion (3)
Prerequisite: Heat Transfer (ME 440).
An introduction to the principles of direct energy conversion systems, such as thermoelectric, photovoltaic, thermionic, magnetohydrodynamic power generators and fuel cells.

ME 555 Mechanical Engineering Analysis (3)
Prerequisite: Consent of instructor.
Analysis and modeling of engineering phenomena related to mechanical systems, thermodynamics, and transfer processes.

ME 560 Nuclear Engineering (3)
Prerequisite: Heat Transfer (ME 440) or Heat Transfer Principles (CHE 434).
Introduction to nuclear power. Nuclear physics. Nuclear radiation. Reactor physics. Reactor kinetics and control. Fuel depletion. Energy removal. Studies of typical reactor types.

ME 570 Fundamentals of Technology for Non-Engineers (3)
Survey of engineering systems and their impact on society. Topics may vary.

ME 580 Air Pollution Control (3)
Prerequisite: General Chemistry II (CHEM 202) and Thermodynamics II (ME 310).
Origin and fate of air pollutants, combustion and pollutant formation processes, control of emissions of gaseous and particulate pollutants and design of various pollution control devices.

ME 612 Finite Element Methods for Mechanical Design II (3)
Prerequisite: ME 512.
Introduction to the finite element method and its application to engineering analysis and design problems. Computer programs are developed.

ME 614 Heating, Ventilating, and Air Conditioning (3)
Prerequisite: Heat Transfer (ME 440).
Psychrometric principles. Detailed calculation of heat loses and heat gain for both heating and cooling of buildings. Basic concepts of refrigeration. Design of actual systems and selection of equipment, with emphasis on solar energy. Automatic controls. Codes and standards. Design project will be required.

ME 616 Gas Dynamics (3)
Prerequisite: Fluid Mechanics II (ME 401).
The thermodynamics of compressible-fluid flow. A detailed study of constant and varying area adiabatic flow, plane shock waves and losses, frictionless diabatic flow. Characteristics and design of efficient flow passages.

ME 618 Heat Exchanger Design (3)
Prerequisite: Fluid Mechanics II (ME 401) and Heat Transfer (ME 440).
Thermal and hydraulic design of heat exchangers. Selection and optimum design of heat exchangers. Cost and construction of heat exchangers.

ME 620 Advanced Mechanics of Solids (3)
Prerequisite: Mechanics of Materials (ME 323).
Cross-listed with CE 620.
Analysis of stress and strain. Topics including theories of failure, unsymmetric bending, curved beams, shear center, torsion, beams on elastic foundations, beams with combined axial and lateral loads, thick-wall cylinders, rotating disc, introduction to elastic stability.

ME 621 Noise and Vibration Control (3)
Prerequisite: ME 435 and Engineering Measurements (ME 314).
Practical aspects of noise and vibration control are studied. Methods for measuring and analyzing noise and vibration. Methods for selecting design criteria. Methods for quieting a product.

ME 622 Theory of Plates and Shells (3)
Prerequisite: ME 620.
Note: Cross-listed with CE 622.
Elastic and plastic analysis of thin plates; membrane analysis and bending theory of shells; additional topics.

ME 624 Failure Analysis and Accident Reconstruction (3)
Prerequisite: Materials Science (CHE 253).
Overview of ferrous metallurgy, dislocation theory, and mechanical properties. Fatigue, creep, brittle fracture, fractography, recovery and recrystallization, corrosion and effects of environment on mechanical behaviors. Vehicular accident reconstruction including skid mark analysis, momentum calculations, lamp bulb examination, etc. Reporting failure analyses and accident reconstructions. Product liability law, the engineer as an expert witness, civil procedures and rules of evidence. Case studies are emphasized.

ME 635 Advanced Mechanical Engineering Analysis (3)
Prerequisite: Consent of instructor.
Formulation of mathematical models for mechanical engineering problems, such as heat transfer, fluid mechanics, dynamics, etc., with special emphasis on computer solutions.

ME 640 Optimum Design Methods (3)
Prerequisite: Machine Design I (ME 422) and consent of instructor.
Optimum solutions of engineering problems by classical and modern methods. Problem formulations and solution techniques.

ME 647 Advanced Design Methods (3)
Prerequisite: ME 442 and ME 497.
Practical techniques for product definition, concept generation and selection, value analysis, parameter design, design for manufacture, life cycle design and product structuring.

ME 650 Computational Methods in Fluid Flow and Heat Transfer (3)
Prerequisite: Consent of instructor.
Solutions of the momentum and thermal boundary-layer equations by means of the Runge-Kutta procedures, methods of solving the boundary-value problems with digital computers, finite-difference methods, finite-element method, and other methods for solving the equation of fluid flow and heat transfer.

ME 655 Computer Simulation of Dynamic Systems (3)
Prerequisite: Introduction to Computer Aided Engineering (ME 355) and Mechanical Vibrations (ME 421) or consent of instructor.
Modeling of electromechanical components and their dynamic interaction as a system. Relating overall system performance to component parameters using general purpose computer simulation programs.

ME 656 Modal Representation of Mechanical Vibrations (3)
Prerequisite: Introduction to Computer Aided Engineering (ME 355) and Mechanical Vibrations (ME 421) or consent of instructor.
The use of modal parameters (eigenvalues and eigenvectors) to represent the dynamic behavior of mechanical structures. Extracting modal parameters from experimental computer aided analysis is discussed in depth. Trouble shooting and experimental techniques are presented.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

ME 661 Advanced Thermodynamics (3)
Prerequisite: Consent of instructor.
Review of thermodynamic fundamentals, with application to selected topics. Irreversible, non-equilibrium thermodynamics.

ME 663 Heat Conduction (3)
Prerequisite: Heat Transfer (ME 440).
Derivation of governing equations. Classical heat conduction solutions with various boundary conditions. Computer applications.

ME 664 Heat Convection (3)
Prerequisite: Heat Transfer (ME 440).
Derivation of equations of mass, momentum, and energy in boundary layers. Solutions of laminar and turbulent flow problems. Computer applications.

ME 665 Radiation Heat Transfer (3)
Prerequisite: Heat Transfer (ME 440).
A comprehensive study of thermal radiation. Discussion of Planck distribution function and Stefan-Boltzmann equation. Study of geometry of radiation. Combined affects with convection. Computer applications.

ME 668 Advanced Mechanical Vibrations (3)
Prerequisite: Mechanical Vibrations (ME 421).
Analytical and computational methods for mechanical vibration problems. Formulation and solution techniques. Modeling and applications.

ME 669 Advanced Dynamics (3)
Prerequisite: Consent of instructor.
Kinematics and dynamics of rigid-body motion. An introduction to variational mechanics, including generalized coordinates and Lag range's equations of motion. Stability of motion, including the Routh-Hurwitz criterion and the Liapounov direct method.

ME 671 Advanced Fluid Mechanics (3)
Prerequisite: Fluid Mechanics II (ME 401).
A study of the Navier-Stokes equation, with application to laminar and turbulent-flow fields for various geometries. Computer applications.

ME 673 Nuclear Reactor Design (3)
Prerequisite: ME 560.
Typical power cycles, reactor heat generation and heat transfer, design of reactors, selection and design of power cycle components. Study of the various contemporary nuclear plants.

ME 675 Advanced Topics in Mechanical Engineering (1-6)
Prerequisite: Consent of instructor.
An advanced course in mechanical engineering topics not covered by regularly scheduled courses.

ME 688 Independent Study in Mechanical Engineering (1-6)

ME 690 M.S. Thesis in Mechanical Engineering (1-6)
Experimental and/or theoretical research to be presented in thesis for degree requirement.

ME 694 Mechanical Engineering Seminar (1-2)
Discussions and reports on current developments in mechanical engineering.

Microbiology and Immunology (5255-MBIO)

Note: *Microbiology and Immunology courses are scheduled according to the School of Medicine calendar; except for MBIO 631 which is on the School of Dentistry calendar.*

MBIO 600 Special Projects in Microbiology (1-2)
Prerequisite: Consent of instructor.
Introduction to selected current problems in microbiology. A laboratory-oriented project will be arranged with a specific faculty member in order to provide for exposure of individual students to concepts and research approaches to problem solving. Every quarter. Pass/Fail grading.

MBIO 601 Medical Microbiology (8)
Lectures, laboratory exercises, demonstrations, conferences, and clinical correlation sessions. A consideration of the role of pathogenic microorganisms in the natural history of infectious diseases and the fundamental principles useful in the isolation and study of microbes. The host's response to such parasites is analyzed, with emphasis on those factors which may lead to altered resistance. In addition, attention is devoted to the basic aspects of immunology and their significance in human disease. First and second quarter.

MBIO 606 Seminar (1)
Prerequisite: Consent of instructor.
Pass/Fail grading.

MBIO 618 Topics in Advanced Microbiology (1-2)
Prerequisite: Consent of instructor.
Pass/Fail grading.

MBIO 619 Research (1-12)
Prerequisite: Consent of instructor.
Pass/Fail grading.

MBIO 620 Thesis (1-6)
Prerequisite: Consent of instructor.
Pass/Fail grading.

MBIO 631 Dental Microbiology & Immunology (6)
Prerequisite: Consent of instructor.
A general course in infectious diseases and immunology. Special emphases are placed on oral infections, immune phenomena, and natural resistance mechanisms. Specific topics include the human immune response, pathogenesis of microbial infections, molecular and microbiological basis of periodontal diseases, pulp and periapical infections and cariogenesis. Fall.

MBIO 658 Cellular and Molecular Immunology (3)
Prerequisite: MBIO 601, BIOC 600 and BIOC 601, or consent of instructor.
Cellular and molecular aspects of normal and pathological immune responses including: cells and tissues involved in immune responses, antibody gene rearrangement and expression, antibody structure and function, antigen processing and presentation, T cell receptors, cytokines and co-stimulatory molecules. Alternate year, third and fourth quarters (1999-2000).

MBIO 667 Advanced Cell Biology (3)
Prerequisite: One quarter of graduate level biochemistry or consent of instructor.
Note: Cross-listed with ASNB 667, BIOC 667 and BIOL 667.
An advanced treatment of cell structure and function including: membranes, organelles, cytoskeleton, cellular communication, and control of cell growth.

MBIO 670 Molecular Virology (3)
Prerequisite: MBIO 601, BIOC 600 and BIOC 601, or consent of instructor.
Deals with fundamental properties of RNA- and DNA-containing viruses of animals and humans including the following subjects: molecular structure and composition of viral particles, intracellular viral replication, viral oncogenesis, recombinant viral vectors, and molecular aspects of viral chemotherapy and immunology. Alternate year, third and fourth quarters (1999-2000).

MBIO 680 Microbial Genetics (3)
Prerequisites: MBIO 601, BIOC 600 and BIOC 601, or consent of instructor.
Deals with mechanisms of mutation, genetic exchange and recombination in bacteria, bacteriophage, and fungi. Transformation, conjugation, transduction, lysogeny, gene mapping, and DNA replicaton and repair will be covered in detail. Alternate year, third and fourth quarters (2001-02).

MBIO 685 Microbial Physiology (3)
Prerequisite: MBIO 601, BIOC 600 and BIOC 601, or consent of instructor.
Deals with the fundamental structure-function, metabolic, and reproductive properties of bacteria and other microorganisms under varied environmental conditions, with correlation of morphological and biochemical changes during growth phases. The mechanisms of action of antimicrobial agents will also be considered. Alternate years, third and fourth quarters (1999-2000).

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

MBIO 687 Microbial Pathogenesis (3)
Prerequisite: MBIO 601, BIOC 600 and BIOC 601, or consent of instructor.
Deals with the general principles of host-parasite interactions, with emphasis on the pathogenetic mechanisms of bacteria, fungi and parasites in the human environment. Descriptions of specific diseases will emphasize microbial virulence factors and current research models. Molecular approaches for studying these mechanisms will be discussed. Alternate years, third and fourth quarters (2001-02).

MBIO 690 Techniques in Microbiology (2-4)
Prerequisite: Consent of chair.
Lectures and laboratories emphasizing modern research and/or diagnostic methods. Pass/Fail grading. Every semester.

Modern Languages (0362-M L)

M L 500 Study Abroad (1-15)
Prerequisite: Membership in a University of Louisville Language Study Abroad Program or a program approved by the department.
Credit awarded upon demonstration of successful completion of program undertaken with prior approval of the department, including a paper or project and an oral or written examination in the language and culture, administered under the supervision of a faculty member.

M L 506 Francophone Women Writers and Critics (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with WMST 571
Readings in creative and critical work by Francophone women from the Middle Ages to the present. Readings and discussion in English.

M L 519 German Intellectual History (3)
Prerequisite: Consent of instructor.
Consideration of German thought and sensibility from the Middle Ages to the present. Readings from Medieval mysticism to postmodernism. Taught in English. Credit may not be earned for this course and GERM 519.

M L 551-552 Special Topics (3-3)
Prerequisite: Consent of instructor.
Special themes and issues of particular significance as reflected in selected works of foreign language, literature or culture. Topics vary.

M L 553 Selected Authors in Foreign Literature (3)
Prerequisite: Consent of instructor.
The life and works of significant authors chosen from the panorama of foreign literature; their literary and/or cultural impact on society. Authors will vary from semester to semester.

M L 561 Masterpieces of Russian Literature (3)
Reading and discussion of the three greatest masterpieces of Russian literature: Tolstoy's War and Peace, Dostoevsky's Brothers Karamazov, and Pushkin's Eugene Onegin.

M L 601 Introduction to Graduate Studies (3)
Introduction to graduate studies in foreign languages, history of field, research techniques, major areas of study, opportunities, ethics.

Music (5420-MUS)

Numbering System:
Applied music course sequences are 501-504, 511-514, 521-522 (open to Senior College or graduate students) and to the sequences 601-604, 611-614, and 621-624 (open to graduate students). Students enroll for credit in these sequences according to the amount of literature and study they expect to cover and according to the instructor's assessment of the student's ability to perform.

Normally, an applied music student will enroll for 4 semester hours on a major instrument or 2 semester hours on a principal or secondary instrument in each of the course sequences.

Exceptional students may be advised to enroll for the greatest amount of course credit.

Applied music majors may use course numbers open only to them; and music history, music education, and music theory-composition majors may use course numbers designated for their enrollment in courses related to their principal instrument. All students will use course numbers reserved for instruction applicable to secondary instruments (521-522).

Instruments:

Piano	Cello
Trumpet	Harpsichord
Bass	French Horn
Organ	Flute
Trombone	Harp
Oboe	Baritone
Voice	Clarinet
Tuba	Violin
Saxophone	Percussion
Viola	Bassoon

MUS 500 Music History Review (0)
The purpose of the course is to provide the student with a reasonable method of removing deficiencies revealed by the Graduate Entrance Examination. No graduate student will be allowed to enroll in any graduate course in a historical period in which he has failed to pass the corresponding section of the Graduate Entrance Examination until he has removed his deficiency in the history of the subject. Areas covered are:

- Deficiencies within the period from the Middle Ages to 1530.
- Deficiencies within the period between 1530 and 1750.
- Deficiencies within the period between 1750 and 1850.
- Deficiencies within the period from 1850 to the present.

MUS 501-502 Major Instrument (2-2)

MUS 503-504 Major Instrument (4-4)

MUS 509-510 Major Ensembles (1-1)
Open to all qualified students after consultation with the director. Orchestra; Band; Collegium Musicum; Opera Theater; Chorus; Black Diamond Choir; Jazz Band; Concert Band; Pep Band; New Music Ensemble; Marching Band; University Chorus; Collegiate Chorale.

MUS 519-520 Minor Ensembles (0.5-0.5)
Open to all qualified students after consultation with the director. Piano; String; Woodwind; Brass; Percussion; Stage Band; Concert Choir; Improvisation; Guitar; Jazz Combo (Instrumental or Vocal); Brass Choir (Trumpet, Trombone, Tuba/Euphonium); Saxophone Ensemble; Opera Workshop; Clarinet, Flute, Harp; Community Band.

MUS 527 Choral Music in the Modern Secondary School (2)

MUS 529-530 Honors Ensembles (0-0)
University Singers. Admission by audition only.

MUS 535 Music Industry I (2)
Prerequisite: Six hours of credit.
A study of current practices affecting the professional musician and a survey of career opportunities relating to music and industry.

MUS 536 Music Industry II (2)
Prerequisite: MUS 535.
Continuation of Music Industry I. Includes broadcast, performance, marketing, retail sales, audio/video engineering, publishing, law and labor relations

MUS 537 Advanced Techniques for Marching Bands (2)
Problems in preparing the half-time show. Arranging for the marching band.

MUS 539 Studies in Jazz (2)
Studies of selected topics relating to the development of Jazz.

MUS 543-544 Advanced Composition (2-2)

MUS 545-546 Advanced Orchestration (2-2)

MUS 549 Counterpoint I (2)
Prerequisite: Theory IV (MUS 242).
A study of sixteenth-century vocal counterpoint in the style of Palestrina and Lassus. Two- and three-part setting of Latin texts.

MUS 550 Counterpoint II (2)
Prerequisite: MUS 549.
A study of eighteenth-century counterpoint, emphasizing Bach's style and leading to chromatic writing of the late nineteenth century.

MUS 551 Basic Synthesizer Techniques (2)
Prerequisite: Consent of instructor.
A study of the electronic production of sound, with emphasis on the utilization of the synthesizer.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

MUS 552 Foundations of Music Theory (3)
A study of selected theoretical writings from the Middle Ages and Renaissance as related to Gregorian Chant and the development of Polyphony.

MUS 553 Computers & Music I (2)
Prerequisite: Consent of instructor.
Fundamentals of MIDI, electronic keyboards, sound modules and ancillary components of computer-assisted music production.

MUS 554 Computers & Music II (2)
Prerequisite: MUS 553.
Advanced sequencer and notation software techniques, MIDI applications in audio engineering, machine control and related devices.

MUS 555 Instrument Repair (2)
Repair of woodwind and brass instruments.

MUS 557-558 Piano Technology (2-2)
Basics of tuning, elementary repair, and maintenance.

MUS 559 Instrumental Conducting and Score Reading (2)
Prerequisite: Orchestration II (MUS 336), or Band Scoring (MUS 346)
Conducting techniques and problems for the public school instrumental director. Reading from full score. Survey of literature.

MUS 560 Choral Conducting and Literature (2)
Prerequisite: Choral conducting technique.
Conducting for the public school choral director. Survey of usable literature.

MUS 561-562 Literature (2-2)

Piano Literature

A survey of late 18th & 19th century literature.

Band Literature

A survey of literature for wind and percussion instruments in large ensemble combinations, focusing upon material for the standard instrumentation of the concert band. Emphasis will be given to the dramatic change in the repertoire from 1950 to present, particularly the implications for instrumental music education. Course work will include both artistic and practical considerations, with study of works by Hindemith, Stravinsky, Schoenberg, Persichetti, Holst, Gould, and Ives.

Organ Literature

Comprehensive survey of the field of organ literature from Schlich to Hindemith. No performance required.

Vocal Literature

A survey of vocal literature from the sixteenth to the twentieth century, with emphasis on standard repertoire. Program analysis and program building.

MUS 563-564 Literature (1-1)
Performance literature for orchestral instruments.

MUS 565-566 Church Music Literature (2-2)
Designed to acquaint the student with church music repertoire of the past and present, and to give practical training in service playing and accompanying.

MUS 570 Studies in Music History (3)
Prerequisite: See note below.
Areas of study are Medieval Music, Renaissance Music, Baroque Music, Viennese Classicism, Romantic Music, Twentieth-Century Music , Jazz.

NOTE: *Courses 570, 580, and 585-586 are intended for masters and for advanced undergraduates admitted by permission of the instructor and with the recommendation of the undergraduate advisor. Master's degree students may, however, enroll in these courses at the 600 level under two conditions: (1) when 600-level courses are required by a specific curriculum (e.g., M.M. in Music History), and (2) with the approval of the student's advisor. Undergraduates may not register in these courses at the 600 level without the approval in writing of the chair of the Music History Department.*

The following criteria, subject to adjustment by the instructor according to the nature of the course and its organization, will distinguish the work of students registered under one or the other number.

Students enrolled in either 500- or 600-level courses are required to write term papers. Research papers at the 600 level are expected to demonstrate originality and the ability to use resources in at least one foreign language, and in general are expected to be of a quality appropriate to a professional paper.

While students enrolled at either level are required to participate in a seminar by presenting reports and papers, those registered at the 600 level may be required to assume full responsibility for the development and direction of a study, by the whole class, of a particular subject or problem.

MUS 571-572 Pedagogy (2-2)
Examination, evaluation, and discussion of piano teaching materials at all levels.

MUS 573-574 Piano Pedagogy Practicum (2-2)

MUS 580 Seminars in the Music of the Great Composers (3)
Prerequisite: See note following course MUS 570
The seminar may be repeated under different subtitles.

MUS 582 Seminar in Historical Performance Practice (3)
Prerequisite: Consent of instructor. Knowledge of one foreign language helpful, but not required.
Study and application of performance techniques from different eras, based on period sources and modern studies.

MUS 583 Notation and Analysis (3)
Paleography, transcription, and editing of musical manuscripts and publications through the Renaissance.

MUS 585 Seminars in the History of Forms, Media, Philosophy, or Techniques of Composition (3)
Prerequisite: See note following course 570.
Areas of study are Chamber Music, Sacred Vocal Music, Orchestral Music, Secular Vocal Music, Compositional Techniques, Literature and History, 19th century Lied, Neo-classicism, Concerto

MUS 590 Independent Study (0.5-3)
This course may be repeated, but no more than 6 semester hours may be counted toward an advanced degree.

MUS 591 Special Topics (1-3)

MUS 597 Recital (0)
A grade of "CR" credit will be given when the recital is complete. A student must be simultaneously enrolled in at least one applied music course.

MUS 601-602 Applied Music (2-2)

MUS 603-604 Applied Music (4-4)
Courses MUS 601-604 open only to music majors for work and study on the student's major or principal instrument.

MUS 607 Bibliography and Research Methods (3)

MUS 611-612 Applied Music (2-2)

MUS 613-614 Applied Music (4-4)
Courses MUS 611-614 open only to music majors for work and study on the student's major or principal instrument.

MUS 621-622 Applied Music (2-2)

MUS 623-624 Applied Music (4-4)
Courses MUS 621-624 open only to music majors for work and study on the student's major or principal instrument.

MUS 627 Advanced Elementary Music Methods (2)

MUS 631 Advanced Methods of Teaching Brass Instruments (2)
Problems in teaching brass instruments in the public schools. Research in methods and materials.

MUS 633 Advanced Methods of Teaching Woodwind Instruments (2)

MUS 637 Advanced Secondary Music Methods (2)

MUS 638 Organization and Administration of Instrumental Groups (2)
Organizing, financing, and promoting the instrumental program.

MUS 641-642 Pedagogy of Theory I,II (2-2)
An analysis and discussion of the various methods of teaching the elements of music theory, including a survey of available textbooks and supplementary materials.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

MUS 643-646 Advanced Private Instruction in Composition and Orchestration (2,2,2,2)

MUS 647-648 Advanced Analysis I,II (2-2)
Development of the aural and visual comprehension of the elements contributing to style and cohesion in music. Representative compositions of all historical periods will be studied.

MUS 649-650 Advanced Counterpoint I,II (2-2)
Prerequisite: MUS 550.
A continuation of the prerequisite counterpoint courses but for the advanced student in the field.

MUS 651 Schenkerian Analysis (3)
Prerequisite: Graduate standing.
The graphic analytic techniques developed by Heinrich Schenker, and the theoretical constructs on which they are based.

MUS 653 Advanced Analysis of Twentieth Century Music (3)
Analytic approaches to the atonal and serial music of composers such as Bartók, Webern, Carter, Boulez, and Ligeti.

MUS 659-660 Seminar in Conducting I,II (2-2)
Advanced conducting techniques as they apply to choral and instrumental ensembles. Literature to be studied drawn from masterworks of every age.

MUS 670 Studies in Music History (3)
Areas of study are Medieval Music, Renaissance Music, Baroque Music, Viennese Classicism, Romantic Music, Twentieth-Century Music .

MUS 671-672 Advanced Piano: Pedagogy I and II (2-2)
Prerequisite: Piano pedagogy, including supervised teaching.
A continuation of the analysis and evaluation of pedagogical materials and techniques of the prerequisite courses. Includes supervised practice teaching.

MUS 675-676 Master's Practice in Collegiate Teaching (1-1)
Experience under the guidance of faculty members in classroom techniques and practices of collegiate teaching. TBA seminars in professional problems. For masters in music history.

MUS 680 Seminars in the Music of Great Composers (3)
Note: This course may be repeated under different subtitles.

MUS 682 Seminar in Musicology (3)

MUS 685 Seminar in Music History (3)

MUS 690 Independent Study (0.5-3)
A maximum of 6 credit hours of independent study may be taken in fulfilling requirements of any music degree at the master's level.

MUS 691 Special Topics (1-3)

MUS 694 Research (1-3)
Subtitles may accompany the course title to indicate the area of research.

MUS 695 Thesis Guidance (2-4)
Prerequisite: Master's candidates in music education, music theory-composition, and music history.

MUS 697 Graduate Recital (0)
A grade of "CR" credit will be given when the recital is complete. A student must be simultaneously enrolled in at least one 600-level applied music course.

NOTE: *The 700-level courses listed below are for students enrolled in the doctoral program that is offered jointly by the University of Louisville and the University of Kentucky. These courses represent the fields of specialization of the graduate faculty in musicology of both institutions.*

MUS 702 Seminar in Musicology (3)
Prerequisite: Consent of instructor.
Study and research in specific musicological problems. May be repeated twice for credit. Offered at the University of Kentucky.

MUS 703 Studies in Music History (2)
Intensive studies of a musical genre, a composer, or a school of composers. Offered at the University of Kentucky.

MUS 718 Doctoral Seminar (3)
Prerequisite: Two semesters of residency and fluent reading knowledge of French and German. Designed for Ph.D. and qualified D.M.A. students. Offered at the University of Kentucky.

MUS 719 Independent Work in Musicology (1-3)
Prerequisite: 4 to 6 hours of graduate credit in the area of specialization and consent of instructor.
May be repeated for a total of 6 credit hours. Offered at the University of Kentucky.

MUS 775-776 Doctoral Practice in Collegiate Teaching (1-3)
Guidance by members of the faculty for doctoral teaching assistants. TBA seminars in the professional problems of collegiate teaching. Only 775 is offered at the University of Louisville; 776 is offered at the University of Kentucky.

Music Education (5481-MUED)

MUED 605 Pre-Student Teaching: Orientation and General Methods (Vocal) (3)
Prerequisite: Admission to MAT and Music Professional Year Teacher Education Program.
Orientation to general methods in teaching K-12 vocal music, rehearsal techniques, and classroom management.

MUED 606 Pre-Student Teaching: Orientation and General Methods (Instrumental) (3)
Prerequisite: Admission to MAT and Music Professional Year Teacher Education Program.
Orientation to general methods in teaching grades 5-12 instrumental music, rehearsal techniques, and classroom management.

MUED 607 Student Teaching Seminar I (2)
Prerequisite: Admission to MAT and Music Professional Year Teacher Education Program.
Emphasis on multicultural and multiethnic music and the teaching of the same.

MUED 608 Student Teaching Seminar II (2)
Prerequisite: Admission to MAT and Music Professional Year Teacher Education Program.
Emphasis on developing strong programs of instruction in general music, choral music, wind and percussion instruments and string instruments.

MUED 609 Capstone Seminar (3)
Prerequisite: Successful student teaching and all other course work for the M.A.T. degree with a music education emphasis.
Present professional portfolios, investigate current issues impacting the lives of students with and without disabilities, and assemble resources to further career goals. Fulfills the exit requirements for the MAT degree with a music education emphasis.

MUED 610 Music Student Teaching in the Elementary/Secondary Schools I (4)
Prerequisite: EDUC 501, EDUC 502, and either EDUC 503 or 504 or 505 or 506; EDSD 605, EDSD 607 (or currently enrolled in EDSD 605 or 606), a 2.75 g.p.a. in major and minor teaching fields, admission to teacher education program, and admission to MAT.
Provides supervised observation, participation and teaching.

MUED 611 Music Student Teaching in the Elementary/Secondary Schools II (4)
Prerequisite: EDUC 501, EDUC 502 and either EDUC 503 or 504 or 505 or 506; EDSD 605, EDSD 606 (or currently enrolled in EDSD 605 or 606); EDUC 610, a 2.75 g.p.a. in major and minor teaching fields, admission to teacher education program, and admission to MAT.
Provides supervised observation, participation and teaching.

MUED 628 Case Studies in Music Education (2)
Study of major research projects in music education.

MUED 629 Music Education I (2)
Philosophy and psychology of school music teaching; survey of music education literature.

MUED 630 Music Education II (2)
Problems in supervision, curriculum construction, and administration.

MUED 639 Gordon Music Learning Theory (2)
An introduction to the terminology and practical applications of Edwin Gordon's music learning theory.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Nursing (5650-NURS)

NURS 550 Foundations for Advanced Practice (3)
Focus is on the analysis and application of selected nursing and family theories for advanced practice. Fall.

NURS 552 Health Care Systems (3)
Emphasis is placed on informed participation in policy making processes and the impact of health policy on advanced practice. Spring.

NURS 615 Advanced Clinical Practice: Ob-Gyn (4-13)
Prerequisite: NURS 550, NURS 655, NURS 656, NURS 658, and PHAR 650.
Explores theoretical and practice applications of the OB/GYN nurse practitioner role with the assistance of a variety of clinical preceptors. Students must have a total of 13 credits in this course to graduate.

NURS 623 Advanced Clinical Practice: Adult CNS (6-13)
Prerequisite: NURS 550, NURS 655, NURS 656, NURS 658 and PHAR 650.
Pre or corequisite: NURS 653.
Opportunity to attain skills needed to practice the CNS role in clinical settings. Students must have a total of 13 credits in this course to graduate.

NURS 625 Advanced Clinical Practice: Adult NP (4-13)
Prerequisite: NURS 550, NURS 655, NURS 656, NURS 658, and PHAR 650.
Pre or corequisite: NURS 653.
Explores theoretical and practical applications of the adult nurse practitioner roles with the assistance of a variety of clinical preceptors. Students must have a total of 13 credits in this course to graduate.

NURS 629 Neonatal Advanced Health Assessment (2.5)
Prerequisite: Permission of NNP Advisor.
Explores theoretical and practice applications of the neonatal nurse practitioner roles related to the care of well neonates.

NURS 635 Advanced Clinical Practice: Neonatal NP (3-9)
Prerequisite: NURS 629
Study of theoretical concepts and research related to the knowledge and clinical proficiency necessary to assess and manage physiologic functions that are deviations from the normal during the transition to extrauterine life as well as the physical, emotional, developmental and nutritional needs of high-risk infants and young children. Includes stabilization of the high-risk newborn, assessment and clinical management of high-risk infants and young children, and expanded assessment of family development. Students must have a total of 9 credits in this course to graduate.

NURS 636 High-Risk Clinical: Neonatal NP (2-8)
Prerequisite: NURS 629
Develops the advanced role of the neonatal nurse practitioner. Emphasizes clinical proficiency in the application of skills necessary to assess, stabilize, and manage a high-risk neonatal population as well as family development and dynamics as a member of an interdisciplinary team. Direct guidance and supervision is provided by physician and/or neonatal nurse practitioner, preceptors or course faculty.

NURS 645 Advanced Clinical Practice: Adult Psychiatric-Mental Health CNS (6-13)
Prerequisite: NURS 647, NURS 649, PHAR 650 and NURS 656.
Focuses on the use and evaluation of short-term models of psychotherapy; psychoeducation; and prevention strategies in advanced practice. Culturally specific interventions are emphasized. Examines major mental health problems. Implements and evaluates interventions with individuals, groups and communities. Students must have a total of 13 credits in this course to graduate.

NURS 647 Psychopathology For Clinical Decision Making (3)
Focuses on psychopathology using current diagnostic categories. Biological and behavioral theories are explored. Cultural manifestations and influences are considered. Additional assessment strategies related to mental illness are reviewed.

NURS 648 Advanced Clinical Assessment: Psych/Mental Health Nursing (3)
Prerequisite: Basic physical/health assessment skills are necessary. Formal basic courses or continuing education courses in physical health assessment are acceptable. Builds upon basic assessment skills. The nurse's knowledge will be expanded to enable the development of the advanced practice role. Critical thinking and communication skills will be enriched by an accurate interpretation of a holistic approach to advanced clinical assessment of the adult.

NURS 649 Clinical Psychopharmacology (1)
Prerequisite: PHAR 650
Co requisite: PHAR 650
Focuses on the major pharmacological issues related to mental illness. Expected therapeutic outcomes, indications, and contraindications for the use of psychiatric drugs in the clinical setting are covered. Ethical and legal issues related to psychopharmacology are considered.

NURS 651 Nursing Research (4)
Prerequisite: NURS 550.
Pre or corequisite: NURS 652.
Provides an orientation and introduction to the methods of nursing and health care research. Spring.

NURS 652 Statistics (3)
Prerequisite: Consent of instructor.
Applied descriptive and inferential statistics using computer software.

NURS 653 Advanced Practice Roles (3)
Focuses on the advance practice roles of educator, consultant, researcher, leader and expert practitioner.

NURS 654 Informatics in Health Care (2)
Focus on how nurses use technology to manage data, information and knowledge. Fall.

NURS 655 Pathophysiology: Clinical Decision Making (3)
Prerequisite: Basic pathophysiology.
Pathophysiological concepts essential for critical thinking and clinical decisions by the nurse in an advanced practice role.

NURS 656 Advanced Clinical Assessment (3)
Prerequisite: Basic health assessment skills.
Builds on basic assessment skills and enriches nurse to use holistic approach to advanced assessment. Fall.

NURS 657 Interventions For Health Promotion (3)
A survey of preventive and maintenance non-pharmacologic interventions for health care personnel to use with individuals and families. Spring.

NURS 659 Issues In Advanced Practice (2)
Examines selected health care, professional ethical and legal forces shaping health care delivery.

NURS 662 FNP: Clinical Practicum I (3)
Prerequisite: NURS 656, NURS 655, PHAR 650, NURS 654 (taken through UK)
Clinical practicum focusing on assessment of health status of individuals, families, and/or aggregates, identification of needs and planning for care with emphasis on prevention and health maintenance.

NURS 665 Advanced Clinical Practice: Gerontology (4-13)
Prerequisite: NURS 550, NURS 655, NURS 656, NURS 658, and PHAR 650.
Pre or corequisite: NURS 653.
Explores theoretical and practical applications of the gerontology nurse practitioner roles with the assistance of a variety of clinical preceptors. Students must have a total of 13 credits in this course to graduate.

NURS 672 FNP: Clinical Practicum II (3)
Prerequisite: NURS 662, NURS 655 (taken through UK) and consent of instructor.
Second clinical practicum focuses on the continuing development of skills in management of health problems in a variety of settings. With nursing and medical supervision, students will gain experience in incorporating illness prevention, maintenance and restoration, health promotion, health education and management of common health problems into a practice style that emphasizes an interdisciplinary management plan.

NURS 682 FNP: Internship (7)
Prerequisite: NURS 672 and consent of instructor.
Focuses upon the synthesis of knowledge and skills gained in the Nurse Practitioner component. Students may obtain additional experience in an area of clinical concentration such as home health, nursing home, and ambulatory care. Emphasis will be placed on the leadership functions of the Nurse Practitioner in health are delivery.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

NURS 690 Special Topics (1-6)
Prerequisite: Consent of instructor.
Selected topics in nursing and health care. Semester topic will be indicated in Schedule of Courses.

NURS 696 Independent Study (1-3)
Prerequisite: Departmental approval.
Provides opportunity for the student, under the supervision of a departmental faculty member, to develop objectives and protocol for independent work related to the practice of nursing.

NURS 698 Research Project (2-3)
Prerequisite: NURS 651.
Provides the student an opportunity to develop, implement and present results of a research study of limited scope.

NURS 699 Thesis (1-6)
Prerequisite: NURS 651.

Occupational Training and Development (0756-EDTD)

EDTD 501-502 Independent Study in Occupational Training and Development (1-3)
Provides Training & Development students with course credit for special investigation into areas not currently subsumed in existing courses.

EDTD 511 Introduction to Human Resources Development (3)
Provides an overview of the field of Human Resources Development and role/competencies required of training and development practitioners.

EDTD 512 Occupational Analysis and Curriculum Development (3)
Development of curriculum relevant to specific job requirements in occupations. Includes development of analyses, measurable performance objectives, lesson designs and course materials.

EDTD 515 Supervised Staff-Industry Exchange (1-3)
Prerequisite: Teacher certification.
Provides essential improvement experience for the occupational education teacher through placement in occupationally oriented job situations which are evaluated to assist the teacher in implementing new skills and updating techniques in the classroom.

EDTD 516 Training Methods and Techniques (3)
Prerequisite: Occupational Analysis and Curriculum Development (EDTD 512) or consent of instructor.
Analysis of and experience in basic occupational teaching methods. Services to special needs stressed. Includes basics of cooperative education coordination.

EDTD 520 Seminar Special Topics (1-5)
Seminar course on selected topics relevant to current issues and concerns in occupational education.

EDTD 530 Occupational Education Instructional Internship (2-8)
Instructional experience in public occupational education programs at the secondary and/or postsecondary level.

EDTD 532 Evaluation of Training (3)
Prerequisite: Occupational Analysis and Curriculum Development (EDTD) 512 or consent of instructor.
Emphasis on the theories and procedures involved in assessing the effectiveness of instructional programs and student/trainee learning in the cognitive, psychomotor and affective domains.

EDTD 540 Practicum in Occupational Subjects (2-8)
Prerequisite: For experienced teachers.
Practicum in occupational education agencies. Experiences in secondary and postsecondary programs; research, administration, instruction, coordination, and development.

EDTD 541 Planning and Coordinating Training Facilities (3)
Prerequisite: Occupational Analysis and Curriculum Development (EDTD) 512 or consent of instructor
A study of requirements in planning, managing and maintaining new or existing facilities. Emphasis on safety requirements as they impact training.

EDTD 560 Adult Learning Principles (3)
Develops better understanding of the way adults learn and how Human Resource personnel can use this information in the Training and Development arena.

EDTD 574 Computers and Technology in Training and Development (3)
Overview of applications of microcomputers and electronic media systems for instruction and management. Emphasis is placed upon use of general purpose integrated computer software. Current issues involving technolody use for instruction will be explored.

EDTD 590 Management Principles for Training and Development (3)
Introduction to the management processes of planning, organizing, leading and controlling. Focus on these principles as they apply to personnel in training and development.

EDTD 596-597 Seminar in Training and Development (1-4)
The investigation of special problems in training and development.

EDTD 604 Planning and Evaluation in Training and Development (3)
Reuired for the M.Ed. in Occupational Training and Development and the M.Ed. in Occupational Education. Required for the certificate in Vocational Education, Supervision and Coordination. Examines planning and evaluation systems in Occupational Education, including Training and Development and public education. Emphasis is placed on principles of planning, managing the planning process, information systems, evaluation, and decision making situations.

EDTD 605 Organization and Administration of Human Resource Development (3)
A study of the organization and administration of occupational education programs. Emphasis placed on modern theories of leadership, organization, and administration and their relationship to all manner of occupational education agencies.

EDTD 610 Principles and Philosophy of Occupational Education (3)
History, philosophy, principles, and practices of occupational education. Emphasizes administrative procedures and local, state, and national priorities.

EDTD 615 Human Resource Development Internship (2-8)
Prequisite: EDTD 661, 662, 672, 663, 604, and 681.
Supervised professional work experience in activities related to the student's program objectives. Designed to provide experience not possible in the classroom setting.

EDTD 630 Occupational Education for Youth and Adults with Special Needs (3)
Emphasis on integrating instructional and/or management activities to assist disadvantaged and handicapped persons enrolled in occupational education programs.

EDTD 640 Graduate Seminar in Human Resource Development (1-4)
Detailed discussion of new and emerging themes in occupational education. Student presentations and guest speakers.

EDTD 661 Adult Development and Learning Principles (3)
Study of current cognitive, psychomotor and effective learning theories and their application to training programs.

EDTD 662 Organizational Analysis for Training and Development (3)
Examination of the process and techniques used to conduct an organizational task and person analysis and to identify training needs in a non-school environment.

EDTD 663 Methods of Facilitation (3)
Development of the presentation skills needed to conduct training programs in non-school settings. Focus placed upon difference between teaching and facilitation of adult learning.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDTD 672 Instructional Design and Development (3)
Systematic processes for the design and development of instruction with application to education and training. Current theory and research on instructional design and development, in accordance with principles of teaching and learning.

EDTD 675 Applications of Instructional Technology (3)
Prerequisite: EDTD 574 or equivalency skills.
Uses hands-on experience with computers and technology to design and produce technology-based materials. Principles of lesson design, screen design, page design, electronic presentaton, web page development, video production, print materials production are emphasized.

EDTD 676 Authoring Multimedia Instruction (3)
Prerequisite: Occupational Analysis and Curriculum Development (EDTD 512) and EDTD 574 or equvalency skills.
Focuses on practical application of computer and technology systems to design and develop multimedia coursewear for self instruction. Principles for design of screen, lesson and courseware are emphasized. An authoring tool is used.

EDTD 681 Research in Training and Development (3)
Study of occupational education research methods and procedures. Emphasis on state and national priorities. Local program research, grantsmanship, information sources, and proposal preparation are explored.

EDTD 695 Teleteaching and Distance Education (3)
Prerequisite: Basic computer proficiency.
Note: Cross-listed with EDSP 695.
Provides hands-on experiences developing and using technology to teach distant learners. Principles and applications of design, development and delivery of instruction using video, audio and computer communications for two-way interactive video.

EDTD 696 Independent Study in Human Resource Development (1-3)
By arrangement with dean and advisor.

EDTD 698 Supervised Readings (1-3)
By arrangement with advisor.

EDTD 699 Thesis or Professional Paper (2-5)
Prerequisite: EDFD 600; consent of dean and advisor.

EDTD 730 Doctoral Seminar in Training and Development (3)
Prerequisite: ED.D. student, or by consent of instructor.
Focuses on recent issues, innovations, and thrusts in training and development. The theoretical basis for actions and application problems are discussed to help students adapt to organizational change and implementation.

EDTD 740 Advanced Internship in Training and Human Resource Development (2-6)
Prerequisite: Ed.D. student with an emphasis in training and development and consent of advisor.
Provides Ed.D. students with advanced on-the-job experiences in the field of human resource development.

Oral Biology (0635-OBIO)

OBIO 501 Biomedical Data Analysis: Experimental Design and Statistics (3)
This course is designed for graduate and professional students in health sciences who require a working knowledge of the experimental design and statistical methods most often utilized in the biomedical sciences. The focus is upon the initial evaluation of scientific literature, the formulation of research protocols, and the interpretation of data. Special attention is given to those areas of data interpretation most common in the health sciences. Fall.

OBIO 600 Concepts in Oral Biology (4)
Prerequisite: Consent of course director.
A multidisciplinary presentation of the biology of the oral cavity, integrating relevant aspects of basic and clinical sciences. Examples of areas covered include: skeletal metabolism, mineral homeostasis (bone healing, periodontal disease); secretory immune defense mechanisms, oral microbial ecology (odontopathic disease); neuromuscular and neurosensory physiology (pain control).

OBIO 601 Introduction to Oral Biology Research (2)
Prerequisite: Acceptance to the degree program or consent of course director.
Introduction to modern research methodology in oral biology. Designed to acquaint the student with a broad spectrum of experimental techniques and concepts which will help prepare for successful design of a research project. Major emphasis is placed on research design, research methodology, critical evaluation of basic research literature, and scientific writing.

OBIO 602 Bone and Calcium Physiology (3)
Prerequisite: Consent of instructor.
Contemporary concepts and literature in bone and calcium physiology. Lectures and student-led discussions.

OBIO 604 Oral Microbiology (3)
Prerequisite: OBIO 60l or professional school courses in microbiology and biochemistry.
An in-depth study of the microbiota and host defense mechanisms with an emphasis on the ecology, nutrition, and biochemistry of the indigenous bacteria.

OBIO 606 Seminar (1)
Student, staff, and guest presentations of current topics in oral biology. Taught on Pass/Fail basis.

OBIO 610 Advanced Topics in Oral Biology (1-4)
Prerequisite: OBIO 600 or consent of instructor.
Selected areas will be investigated in depth, using one or more of a variety of formats including lectures, seminars, tutorials, and research projects.

OBIO 619 Research (1-8)
Taught on Pass/Fail basis.

OBIO 620 Thesis (1-8)
Prerequisite: Consent of instructor and acceptance to degree program in oral biology.
This course allows graduate credit to be obtained for performing research and completing a thesis.

OBIO 631 General Pathology (5)
General principles and concepts of systemic disease taught in a lecture seminar and laboratory format. The etiology, pathogenesis , sequelae, and prognosis of specific diseases are discussed. In addition, recognizable signs and symptoms of general and specific diseases and treatment for these diseases are presented. 3 hrs. lect., 3 hrs. lab.

Pan-African Studies (0369-PAS)

PAS 505 The Black Atlantic (3)
Prerequisite: 12 hours PAS credit or consent of instructor.
Examination of the intercultural and transnational linkage of Africans in England, North and South America, the Caribbean and the African continent.

PAS 506 Service Learning (3)
Placement of students in nonprofit organizations in the Louisville metropolitan region to provide research or programmatic assistance to local community groups. Written reports and frequent consultation with a professor may be required.

PAS 514 History of Pan-African Social Thought (3)
Prerequisite: Consent of instructor.
Contributions of African and African-American social theorists from Marcus Garvey to Cornell West; role of ideology in relations of domination and oppression.

PAS 515 Race and Racism (3)
Prerequisite: 12 hours PAS credit or consent of instructor.
Manifestations, dynamics and impact of racism in the contemporary American social order. Topics covered include affirmative action, multiculturalism, and inequality.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

PAS 525 African-Americans in Contemporary American Society (3)
Prerequisite: Consent of instructor.
An intensive survey of the current economic, political, educational and social status of persons of African descent in American Society.

PAS 529 Teacher Institute on African-American Issues (3)
Note: Cross-listed with EDEM/EDSD 590.
An introduction to Pan-African Studies focusing on multicultural educational strategies for public school educators.

PAS 531 Survey of African-American History and Culture for Teachers (3)
Note: Cross-listed with EDEM/EDSD 592.
An intensive survey of the history and culture of African-Americans for teachers.

PAS 540 Pedagogy of African Studies (3)
Designed for teachers preparing to introduce African studies materials to primary and secondary school students.

PAS 550 African Popular Culture (3)
Examination of the popular arts of Africa, focusing on the variety of esthetic forms, performance styles, and the sociocultural and political contexts in which they are found.

PAS 560 Geography and Nutrition Among Africans and African Americans (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with GEOG 520.
Comparison of geographical conditions, food culture, technology and socioeconomic factors among Africans and African Americans affecting health and nutrition.

PAS 566 Race and Gender in Psychological Research (3)
Note: Cross-listed with PSYC 566.
Critical review of psychology with respect to issues of race and gender. Examines theory and research paradigms, modern, postmodern and Afrocentric methodologies.

PAS 567 Post-Colonial Voices: Writing "Experience" in African Literature (3)
Prerequisite: Consent of instructor.
Examination of 'postcoloniality' through a selection of fiction and literary criticism written by African writers.

PAS 581 Pan-African Art: Form and Content (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with ARTH 641.
Similarities and differences in African-American folk art, Caribbean folk art and traditional African art.

PAS 586 Field Research (3-6)
Prerequisite: 12 hours PAS credit or consent of instructor.
On-site field study of a particular aspect of society in the African diaspora. Maximum of 6 credit hours, depending upon project.

Pharmacology and Toxicology (5280-PHAR)

PHAR 601 Principles of Medical Pharmacology (7)
Graduate student enrollment is limited. The course encompasses the principal classes of drugs. Two-semester course, yearly.

PHAR 603 Pharmacology and Dental Therapeutics (4)
Prerequisite: Consent of instructor.
Course encompasses the principal classes of drugs. Second semester, yearly.

PHAR 606 Seminar (1)
Oral presentation of current topics in pharmacology. First and second semesters, yearly.

PHAR 616 Advanced Pharmacology (1-12)
Work conducted outside the thesis area and with a preceptor other than the thesis director. By special arrangement.

PHAR 618 Topics in Pharmacology and Toxicology (1-12)
Prerequisite: Department majors only.
Topics of current interest in pharmacology and toxicology.
By special arrangement.

PHAR 619 Research (1-12)

PHAR 620 Thesis (1-6)

PHAR 630 Toxicology: Principles and Application (3)
Prerequisite: PHAR 601 and PHY 601.
A survey of the interdisciplinary science of toxicology, providing an introduction to concepts concerning adverse effects of toxic agents on physiological systems. Spring, odd-numbered years.

PHAR 633 Biochemical Neuropharmacology (2)
Prerequisite: PHAR 601 or concurrently taken.
A course on the biochemical basis of neurotransmitter action, with particular emphasis on the central nervous system.
Recent advances in neurotransmitter mechanisms will be emphasized. Spring, even-numbered years.

PHAR 636 Biochemical and Molecular Pharmacology (2)
Prerequisite: PHAR 660, BIOC 601, and PHY 601.
A course covering the basic principles of ligand-macromolecule interactions, drug action at the molecular level, and spectroscopic techniques used in the characterization of these interactions. Fall, even-numbered years.

PHAR 650 Advanced Nursing Pharmacology (3)
Provides the basic pharmacological foundation for the nurse practitioner and clinical specialist in advanced practice.

PHAR 660 Principles of Drug and Chemical Action (3)
Prerequisite: A biochemistry and physiology course.
Fate of drugs and chemicals following their administration. Distribution, metabolism, molecular mechanisms of action, and tolerance. First semester.

PHAR 663 Neuropharmacology (2)
Prerequisite: PHAR 601 or 660 and consent of instructor.
Biochemical effects of drugs which act on the autonomic and central nervous system. Third quarter.

PHAR 665 Research Methods in Pharmacology & Toxicology (1-12)
Prerequisite: PHAR 660, BIOC 600-601, PHY 601 and a basic statistics course and consent of instructor.
A laboratory course exploring experimental design, modern pharmacological techniques, data analysis and microcomputer application.

Philosophy (0371-PHIL)

PHIL 501 Independent Study (1-3)

PHIL 503 Philosophical Writing and Research (3)
Prerequisite: Two courses in Philosophy.
Development of analytical abilities in philosophical reading and writing; argument analysis and construction in various modes and styles.

PHIL 504 Philosophy of History (3)
Note: Cross-listed with HIST 504.
Speculations of the meaning of history from ancient times to the present; discussion of such contemporary issues as the nature of explanation, objectivity, truth, etc., in history.

PHIL 505 Selected Topics (3)
Prerequisite: To be determined by instructor, in the light of the topic chosen for that semester. Offered as needed.

PHIL 512 Advanced Symbolic Logic (3)
Prerequisite: Introduction to Symbolic Logic (312) or consent of instructor.
Topics in the theory and application of modern logic.

PHIL 521 Ethical Theory (3)
Prerequisite: One course in ethics or consent of instructor.
Recent developments in ethical theory, such as examinations of the status of moral facts; moral realism; impartiality and,personal attachments; or moral agency.

PHIL 522 Virtue Ethics (3)
Prerequisite: Two courses in Philosophy or consent of instructor.
Historical and contemporary approaches to ethics that emphasize virtue and character.

PHIL 528 Philosophy of Mind (3)
Prerequisite: Two semesters of philosophy or consent of instructor.
Philosophical analysis of contemporary theories about the mind.

PHIL 531 Aesthetics (3)
An examination of philosophical theories of art, works of art, creative activity, and aesthetic experience, from Plato to the present. Credit may not be earned in both 53l and 63l.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

PHIL 534 Critical Theory: The Frankfurt School (3)
Prerequisite: Two semesters in philosophy or consent of instructor.
Examines in an interdisciplinary context the critique of society developed by Horkheimer, Adorno, Marcuse, and Habermas.

PHIL 536 Philosophy of Science (3)
Prerequisite: Two courses in philosophy and two courses in biology, chemistry, physics, or geology or consent of instructor.
Philosophical problems connected with scientific explanation, laws, theories, concepts, goals and methods.

PHIL 537 Philosophy of the Social Sciences (3)
Prerequisite: One philosophy course and one upper-level course in political science, psychology, sociology, anthropology, economics, or geography; or consent of instructor.
Critical analysis of methodological, valuational, and metaphysical problems in the social sciences.

PHIL 538 Theory of Knowledge (3)
Prerequisite: Junior standing or consent of instructor.
Philosophical problems concerning knowledge, especially perception, memory, and other minds.

PHIL 540 Recent Epistemology (3)
Intensive study of current theory and research in epistemology.

PHIL 553 Plato and Platonism (3)
Prerequisite: Ancient Philosophy (PHIL 301) or consent of instructor.
Plato's dialogues, and the course of Platonist thought through Plotinus and the Christian philosophers, to modern times.

PHIL 554 Aristotle and Aristotelianism (3)
Prerequisite: Ancient Philosophy (PHIL 301) or consent of instructor.
Aristotle's basic works and their influence on St. Thomas Aquinas and others in the Middle Ages.

PHIL 560 Continental Rationalism (3)
Prerequisite: Two semesters of philosophy or consent of instructor.
Basic works of Descartes, Spinoza, and Leibniz, studied from systematic and historical viewpoints.

PHIL 561 British Empiricism (3)
Prerequisite: Two semesters of philosophy or consent of instructor.
Basic works of Locke, Berkeley, and Hume, studied from historical and systematic viewpoints.

PHIL 565 Philosophy of Marxism (3)
Prerequisite: Two semesters of philosophy or consent of instructor.
Marxist thought from historical and systematic viewpoints.

PHIL 566 Philosophy of Socialism (3)
Study of socialist thinkers such as Marx, Engels, Kolakowski, Marcuse, and Harrington, with emphasis on current political-economic problems and on evaluation of socialist solutions.

PHIL 570 Pragmatism (3)
Prerequisite: Two semesters of philosophy or consent of instructor.
The thought of Peirce, James, Dewey, C.I. Lewis, F.C.S. Schiller, and others.

PHIL 571 Classical American Philosophy (3)
Prerequisite: Two courses in philosophy.
Philosophers who wrote during a period of intense philosophical activity in America--Royce, Peirce, James, Santayana, Whitehead, and Dewey.

PHIL 572 Phenomenology (3)
Prerequisite: Modern Philosophy (PHIL 303) or consent of instructor.
The development of the phenomenological method and its use from Husserl to the present.

PHIL 573 Existentialism (3)
Prerequisite: Two semesters of philosophy or consent of instructor.
The thought of Kierkegaard, Nietzsche, Heidegger, Jaspers, Sartre, Marcel, and others, and its significance.

PHIL 576 Philosophical Analysis (3)
Prerequisite: Recent Philosophy (PHIL 304).
Selective study of 20th century philosophy in the English-speaking world.

PHIL 601-602 Independent Study (1-3)
Directed study and research.

PHIL 603 Philosophical Writing and Research (3)
Development of analytical abilities in philosophical reading and writing; argument analysis and construction in various modes and styles.

PHIL 605 Special Topics (3)
Prerequisite: To be determined by instructor, in the light of the topic chosen for that semester.

PHIL 608 Aquinas (3)
The works of Thomas Aquinas studied from historical and systematic viewpoints.

PHIL 610 Descartes (3)
The works of Rene Descartes, studied from historical and systematic viewpoints.

PHIL 620 Kant (3)
The works of Immanuel Kant, studied from historical and systematic viewpoints.

PHIL 625 Hegel (3)
The works of Hegel, studied from historical and systematic viewpoints.

PHIL 631 Aesthetics (3)
An examination of philosophical theories of art, works of art, creative activity, and aesthetic experience, from Plato to the present. Credit may not be earned in both 531 and 631.

PHIL 633 William James (3)
The works of William James, studied from historical and systematic viewpoints.

PHIL 640 Recent Epistemology (3)
Intensive study of current theory and research in epistemology.

PHIL 641 Recent Philosophy of Language (3)
Note: Cross-listed with LING 641.
Intensive study of current theory and research in the philosophy of language.

PHIL 660 Wittgenstein (3)
The works of Wittgenstein, studied from historical and systematic viewpoints.

PHIL 671 Heidegger (3)
The works of Martin Heidegger, studied from historical and systematic viewpoints.

PHIL 674 Sartre (3)
The works of Jean-Paul Sartre, studied from historical and systematic viewpoints.

PHIL 681 Philosophies of Community (2 or 3)
Historical survey of some major theories of community, critical analysis of the concept, and the development of individual theories.

PHIL 695-696 Thesis Guidance (3-3)

Physics (0376-PHYS)

PHYS 501-502 Independent Study (1-3)

PHYS 520 Vibrations and Sound (3)
Prerequisite: Introductory Mechanics, Heat & Sound (PHYS 298), Introductory Electricity, Magnetism & Light (PHYS 299) and Analytical Geometry & Calculus II (MATH 206).
Vibrating bodies, propagation of sound waves, physical acoustics, and ultrasonics. 3 hrs. lect. Offered as needed.

PHYS 530 Thermodynamics (3)
Prerequisite: Introductory Electricity, Magnetism & Light (PHYS 299) and Analytical Geometry & Calculus III (MATH 301).
The laws of thermodynamics, relations between thermodynamics properties. Behavior of gases, magnetic materials, elastic materials . Low temperature phenomena. 3 hrs. lect. Fall.

PHYS 531 Introductory Statistical Physics (3)
Prerequisite: PHYS 530.
Elementary probability theory applied to the understanding of properties of macroscopic matter in terms of their microscopic constituents. Kinetic theory of gases, transport phenomena. Equations of state derived from ensemble theory. 3 hrs. lect. Offered as needed.

PHYS 541 Electromagnetic Fields (3)
Prerequisite: Introductory Mechanics, Heat & Sound (PHYS 298), Introductory Electricity, Magnetism & Light (PHYS 299) and Introductory Modern Physics (PHYS 300).
Electrostatic and magnetostatic fields in free space and in material media, solutions of Poisson's equation, time dependent fields, Maxwell's equations. 3 hrs. lect. Fall.

PHYS 542 Electromagnetic Radiation (3)
Prerequisite: PHYS 541 and Differential Equations (MATH 405).
Propagation of electromagnet fields with applications to optics and microwave physics. 3 hrs. lect. Spring.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

PHYS 545 Advanced Optics (3)
Prerequisite: Optics (PHYS 355) and PHYS 542; or consent of instructor.
Topics in optical physics including optical system design, lasers, and quantum optics.

PHYS 546 Advanced Optics Lab (1)
Prerequisites: Optics (PHYS 355) or equivalent.
Laboratory experiments illustrating fundamental optical phenomena, the interaction of light and matter, lasers, and quantum optics.

PHYS 555 Elementary Quantum Mechanics (3)
Prerequisite: Mechanics (PHYS 460) and Differential Equations (MATH 405).
Schrodinger equation and solutions; Introduction to perturbation theory; applications. 3 hrs. lect. Fall.

PHYS 556 Quantum Theory of Matter (3)
Prerequisite: PHYS 555.
Application of quantum mechanics and relativity to atomic spectroscopy, molecular physics, quantum statistics, band theory of solids, basic properties of nuclei and particles. 3 hrs. lect. Spring.

PHYS 561-562 Mathematical Physics I and II (3-3)
Prerequisite: Differential Equations (MATH 405).
Selected Mathematical techniques and their applications to various fields of physics. 3 hrs. lect. Fall-spring.

PHYS 565 Computational Physics (3)
Prerequisite: Mechanics (PHYS 460) and familiarity with a programming language.
Pre or corequisite: PHYS 555 or PHYS 561.
Introduction to modern computational methods in physics with applications to problems in different branches of physics.

PHYS 570 Atomic and Molecular Physics (3)
Prerequisite: PHYS 541 and 555; or consent of instructor.
The structure of atoms and diatomic molecules, the production of coherent radiation and its interaction with matter. 3 hrs. lect. Offered as needed.

PHYS 575 Solid State Physics (3)
Prerequisite: PHYS 541, 555, or consent of instructor.
Crystal structure, elastic waves, lattice dynamics, phonons, band theory of solids and conductivity phenomena. 3 hrs. lect. Alternate years.

PHYS 580 Nuclear Physics (3)
Prerequisite: PHYS 541 and 555; or consent of instructor.
Phenomenological study of nuclear properties. Nuclear structure and reactions, radioactive decay, interaction of charged particles with matter. 3 hrs. lect. Alternate years.

PHYS 585 Elementary Particle Physics (3)
Prerequisite: PHYS 541 and 555, or consent of instructor.
Properties of elementary particles. Detectors and accelerators. Weak and electromagnetic interactions. Quark model of hadrons, strong interactions.

PHYS 589 General Relativity (3)
Prerequisite: Calculus III (MATH 301) and Mechanics (PHYS 460).
Review of classical gravitation and special relativity, Riemannian geometry, Einstein field equations, exact solutions, tests of the theory, gravitational collapse and black holes, gravitational waves, cosmology.

PHYS 595 Special Topics (1-3)
Introduction to an advanced topic or elaboration of an intermediate topic not treated comprehensively in a regular course.

PHYS 605 Theoretical Mechanics (3)
Prerequisite: Mechanics (PHYS 460), PHYS 561 and 562 and consent of instructor.
Analytical dynamics of systems of particles and rigid bodies. Hamiltonian and Lagrangian formulations, special relativity, canonical transformations, Hamilton-Jacobi theory and action-angle variables. 3 hrs. lect.

PHYS 611-612 Electromagnetic Theory I and II (3-3)
Prerequisite: PHYS 542 and 561 and consent of instructor.
Microscopic and macroscopic Maxwell's equations; The energy-momentum tensor; multipole radiation; radiation from accelerated charges; scattering and dispersion; and covariant formulation. 3 hrs. lect. Fall and Spring.

PHYS 621-622 Quantum Mechanics I and II (3-3)
Prerequisite: PHYS 556 and 605 and consent of instructor.
Nonrelativistic quantum mechanics. Hilbert space formalism, Schrodinger and Heisenberg representations, angular momentum theory, perturbation theory, scattering theory. Systems of identical particles and symmetries. Applications. 3 hrs. lect. Fall and Spring.

PHYS 623 Relativistic Quantum Mechanics (3)
Prerequisite: PHYS 622 and consent of instructor.
Relativistic wave equations. Dirac theory of the electron. Neutrino theory. Applications. 3 hrs. lect. Offered as needed.

PHYS 625 Statistical Mechanics (3)
Prerequisite: PHYS 531 and 555 and consent of instructor.
Application of ensemble or information theory to derivation of the laws of thermodynamics for classical or quantum systems. Properties of perfect and imperfect gases, magnetic phenomena, fluctuation phenomena, and the Onsager equations. 3 hrs. lect. Offered as needed.

PHYS 640-641 Solid State Physics I and II (3-3)
Prerequisite: PHYS 575 and concurrent registration in Quantum Mechanics and consent of instructor.
Quantum mechanical foundation of the theory of solids, the many-body problem, the band approximation, and other approximate methods. Electron-photon interaction, theory of superconductivity, electronic transport processes. 3 hrs. lect. Offered as needed.

PHYS 670 Special Topics (1-12)
Prerequisite: Concurrent or previous registration in PHYS 605, 611, or 621 and consent of instructor.
One or more advanced topics not treated comprehensively in the regular courses.

PHYS 690 Independent Study (1-12)
Prerequisite: Consent of instructor.
Advanced study conducted under the direction of a faculty member.

PHYS 695 Research Seminar (1-12)
Prerequisite: Consent of instructor.
Regular but informal meetings of faculty members and graduate students active in an area of research to discuss problems of mutual interest, and to review the current literature.

PHYS 699 Research (1-12)
Prerequisite: Consent of instructor.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Physiology and Biophysics (5285-PHY)

PHY 601 Mammalian Physiology (9)
Prerequisite: Permission of departmental chair.
Consideration of the fundamental principles of general physiology combined with systematic discussion of mammalian and especially human physiology. Some applications of these principles are made to interpretation of disease. Classes meet according to Medical School schedule. Spring.

PHY 605 Systemic Physiology (6)
Prerequisite: Consent of instructor.
Provides a presentation of the basic concepts and integrated control mechanisms of human physiology. Classes meet according to Dental School Schedule. Spring.

PHY 607 Principles of Oral Presentations (3)
Prerequisite: Consent of instructor.
A discussion of methods of seminar and scientific research meeting presentations. Students will practice the skills which are discussed. Fall, every odd-numbered year.

PHY 608 Principles of Written Presentations I (3)
Prerequisite: Consent of instructor.
A discussion of methods for manuscript and grant proposal preparation. Students will practice the skills which are discussed. Fall.

PHY 609 Integrated Systemic Physiology (3)
Prerequisite: PHY 601 and consent of instructor.
Designed to provide reinforcement, expansion and integration of basic physiologic concepts of human organ systems.

PHY 610 Principles of Written Presentation II (3)
Prerequisite: Consent of instructor.
Discussion of methods for grant proposal preparation. Students will practice the skills which are discussed. Spring.

PHY 616 Selected Topics in Physiology and Biophysics (1-12)
Detailed discussion of physiological and biophysical problems of particular interest to students and staff. Topics will be announced in the schedule.

PHY 617 Seminar in Physiology and Biophysics (1)

PHY 619 Research (1-20)

PHY 620 Thesis (1-6)

PHY 625 Experimental Physiology Laboratory I (3)
Prerequisite: Consent of instructor.
Practical experience with techniques common to physiological research, including instrumentation, surgical procedures and experimental design. Fall.

PHY 626 Experimental Physiology Laboratory II (3)
Prerequisite: Consent of instructor.
Continuation of 625. Spring.

PHY 652 Renal Mechanisms in Pathological Conditions (3)
Prerequisite: PHY 601 and consent of instructor.
Pathological mechanisms causing alterations in renal function. Primary emphasis will be placed on shock and hypertension mechanisms. Lectures, seminars, and student presentations. Spring, every odd-numbered year.

PHY 667 Cardiopulmonary Physiology: Mechanisms and Control (3)
Prerequisite: PHY 601 and consent of instructor.
This advanced physiology course reinforces and expands upon the basic physiological mechanisms which regulate and integrate cardiac and pulmonary function.

PHY 673 Physiology of Reproduction (3)
Prerequisite: PHY 601 or consent of instructor.
The mammalian reproductive system in relation to neuroendocrine control mechanisms physiological effects or reproductive hormones and hormonal interactions. Male and female physiology from fetal through postmenopausal stages of the reproductive life cycle. Spring/3-year cycle, from Spring 1994.

PHY 680 Physiology of Inflammation (3)
Prerequisite: PHY 601 and consent of instructor.
The influence of microcirculation; macromolecular permeability, tissue water balance, and tissue blood flow on the process of inflammation. Fall, odd-numbered years.

PHY 683 Vascular Smooth Muscle Function (3)
Prerequisite: PHY 601 and consent of instructor.
Review of current concepts of vascular smooth muscle function including vascular smooth muscle ultrastructure, biochemistry and factors influencing vascular reactivity. Spring, even-numbered years.

PHY 686 History of Physiology and Medicine (2)
Review of the historical background which binds Physiology and Medicine. Readings and discussion of history from Aristotle to the present. Fall.

PHY 687 Seminar in Molecular Basis of Cardiovascular Physiology (3)
Explores the use of current molecular biology techniques in the discovery of cardiovascular regulatory mechanisms. Emphasis will be placed on hormonal systems involved in blood pressure control and their relation to the development of hypertension. Fall.

PHY 799 Dissertation (1-12)
Prerequisite: Permission of departmental chair.
The terminal research course for the Ph.D. degree to finalize data analyses and manuscript preparation for the Ph.D. Dissertation.

Political Science (0378-POLS)

POLS 501 Topics in American Politics (3)
An advanced examination of one or more selected contemporary problems in American government, such as national-state relationships, civil rights, foreign policy, labor relations, and taxation policy. Topics to be varied from year to year. Individual research projects and reports will be required.

POLS 502 Topics in Comparative Politics (3)
A comparative study of governments of selected countries, stressing one or more subjects such as party systems, policy-making processes, administration, regulation of economics, and others to be determined each time course is offered.

POLS 504 Topics in Political Philosophy (3)
Prerequisite: Consent of instructor.
An examination of one or more selected topics in the study of political philosophy. Individual research projects and reports will be required.

POLS 505 Topics in Urban and Public Policy (3)
An interdisciplinary study of metropolitan problems, providing an opportunity to probe into basic long-range trends and human factors.

POLS 506 Topics in International Relations (3)
Prerequisite: Consent of instructor.
An advanced focus on one or more selected topics in world politics. Research projects, reports and simulations will likely be required.

POLS 510-511 Practicum (1-3 each)
Prerequisite: Consent of instructor.
Practical internship in government. Application must be made before enrollment. Placement opportunities are limited.

POLS 519 Urban Poverty and Policy (3)
An examination of the causes of the poverty problem in American cities and the public policy responses to that problem.

POLS 530 International Negotiation (3)
An examination of the politics of interstate bargaining. Various theoretical perspectives are examined as well as several real world examples. Students will participate in role-playing exercises.

POLS 535 Problems in American Foreign Policy (3)
Prerequisite: Consent of instructor.
A study of the changing international roles of the United States and the problems it faces in making adjustments to external pressures.

POLS 552 Politics through Film (2-3)
An examination of authority patterns, political change, using cinematic portrayals as the primary literature base for investigation.

POLS 554 Democratization and Regime Change (3)
Prerequisite: Comparative Political Systems (POLS 202) or Honors Introduction to Political Science (POLS 299), and consent of instructor.
An analysis of regime types including authoritarian, totalitarian, and types of regime transformations: war, revolution, coup d'etat, and reform. Special attention given to the process of democratization.

POLS 555 Middle East Political Thought and Institutions (3)
Prerequisite: Introduction to Middle East Politics (355).
The sociopolitical and religiocultural development of the Middle East peoples and states in their Moslem, Judaic, and Christian setting, with special attention to the interplay of domestic and foreign policy.

POLS 563 Women and Leadership in Developing Countries (3)
Note: Cross-listed with WMST 558
Follows the progress of the international women's movement by focusing on the emergence of women leaders and their work in developing countries since the First World Conference on Women 1975 to the present.

POLS 568 Feminist Theory (3)
Note: Cross-listed with WMST 556.
Survey of the history and scope of the feminist tradition with emphasis upon liberal, radical, Marxist, socialist, psychoanalytic, and postmodern approaches to feminist theory.

POLS 602 Urban Political Economy (3)
Examines the role of public/private sectors in shaping policy in community and consequences for urban growth and quality of life.

POLS 609 Seminar in Urban Problems (3)
Exploration of field of urban politics/government with focus on urban institutions, governance and selected urban problems and policies.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

POLS 615 Administrative Law and Process (3)
Note: Cross-listed with PADM 610/ UPA 662.
Study of processes of law-making and application by governmental executive departments. Encompasses substantive issues facing agencies in designing and implementing effective regulation and court efforts to interpret and control agencies' activities.

POLS 619 Seminar in Public Policy (3)
Formulation, implementation, qualitative evaluation, ethical aspects of public policy including political, legal, and administrative aspects.

POLS 620 Topics in Public Policy (3)
An examination of one or more selected topics in the study of public policy.

POLS 625 Seminar in Public Administration (3)
Note: Cross-listed with UPA 661.
Basic principles of public administration, with analysis of problems of bureaucracy, organization, financial management, and public control.

POLS 626 Public Personnel Policy (3)
An examination of functions and processes of public personnel administration, such as staffing, classification, training, evaluation, and labor relations. Development of theoretical frameworks for personnel field.

POLS 629 Seminar in American Politics (3)
Current approaches, issues in American politics, evaluation of state of knowledge in various subfields of American government, politics.

POLS 630 Topics in American Politics (3)
Investigation of selected problems in American politics.

POLS 638 Seminar in American Foreign Policy (3)
Issues and perspectives in American foreign policy topics include theories of American foreign policy, historical epochs in the Cold War era, alternative strategies in nuclear deterrence, America's responses to the post-Cold War environment.

POLS 639 Seminar in International Relations (3)
Study of world politics, focusing on central theoretical, perspectives and substantive issues affecting interstate conflict and cooperation.

POLS 640 Topics in International Relations (3)
Study of selected substantive or theoretical issues involving world politics. Topics will vary from semester to semester.

POLS 647 Seminar in Latin America (3)
The political and social-economic developmental processes of Latin American nations. Testing of hypotheses concerning political parties, electoral processes, elites, and development.

POLS 649 Seminar in Comparative Politics (3)
Survey of major theories, concepts, approaches of comparative politics, development of the field and methodology of comparative political analysis.

POLS 650 Topics in Comparative Politics (3)
Study of politics and government in selected countries/regions, or study of processes, institutions or policies from a cross-national perspective.

POLS 652 Presidents and Prime Ministers (3)
A comparative study of the chief of state and heads of government roles in presidential and parliamentary systems of government examining the American and other selected systems.

POLS 670 Scope of Political Science (3)
An examination of the substantive areas of inquiry in political science, and the diverse bases for explanation of political phenomena undertaken within the field of political science. (Required of all graduate students.) Fall.

POLS 671 Methods of Political Research (3)
A survey of research techniques in the field of government.

POLS 691 Independent Study I (1-12)
Credit according to achievement.

POLS 692 Independent Study II (1-12)
Credit according to achievement.

POLS 695 Directed Research (3)
Prerequisite: Student must be in last semester of his/her course work. An intensive independent research project directed by a department faculty member. Intended for students completing the nonthesis degree option.

POLS 699 Thesis Guidance (1-6)

Psychology (0381-PSYC)

PSYC 501 History of Psychology (3)
Prerequisite: 15 hours of psychology standing.
Emergence of experimental and clinical psychology from its philosophical and physiological origins. Fall.

PSYC 514 Advanced Statistics I (3)
Prerequisite: Quantitative Methods in Psychology (PSYC 312).
Review of elementary statistics from a theoretical point of view; probability theory including sample spaces, density and distribution functions, expectations, and moments; estimates and properties of estimators; hypothesis testing, t-test, nonparametric statistics; contingency. Fall.

PSYC 516 Introductory Mathematical Psychology (3)
Prerequisite: PSYC 514 or consent of instructor.
Survey of basic applications of probability and mathematics to theories in learning, perception, and social psychology. Major topics will include stochastic learning models, theory of signal detectability, choice behavior, and models of social interaction.

PSYC 524 Psycholinguistics (3)
Prerequisite: Cognitive Processes (PSYC 322) or Foundations of Language (LING 518).
Note: Cross-listed with LING 524.
Psychological aspects of language and their significance for analysis and understanding of cognitive and social processes.

PSYC 531 Sensation and Perception (3)
Prerequisite: Consent of instructor.
A survey of phenomena in sensation and perception, including the study of methods and mechanisms.

PSYC 543 Sensory Processes (3)
Prerequisite: Perception (PSYC 331) or consent of instructor.
Survey of physiological, neurological, and psychological bases of vision, audition, somesthesis, and other senses. Offered as needed.

PSYC 544 Animal Behavior and Behavioral Ecology (3)
Prerequisite: Consent of instructor.
Survey of sensory and behavioral characteristics of animal species, with stress upon ecological variables. Offered as needed.

PSYC 556 Human Engineering (3)
Prerequisite: Experimental Psychology (PSYC 311), Quantitative Methods in Psychology (PSYC 312), and Psychological Research & Statistical Analysis (PSYC 316-317), or consent of instructor.
Application of experimental methods and data to problems of engineering and production. Offered as needed.

PSYC 561 Evolutionary Psychology (3)
Evolution of epigenetic processes and reproductive and parental strategies. Emphasis is upon primate and human psychosocial development. Spring.

PSYC 566 Race and Gender in Psychological Research (3)
Note: Cross-listed with PAS 566.
Critical review of psychology with respect to issues of race and gender. Examines theory and research paradigms, modern, postmodern and Afrocentric methodologies.

PSYC 571 Special Topics in Psychology (3-4)
Prerequisite: Permission of the Instruction
Survey and analysis of current theory, research and application in a specialized topic of current interest. Undergraduate, Psychology Honors, or Graduate credit available with consent of instructor.

PSYC 575 Personality (3)
A review of major personality theories in terms of experimental and clinical findings.

PSYC 581 Introduction to Behavioral Medicine (3)
Prerequisite: Introduction to Psychology (PSYC 201).
Survey of theory and research on psychological factors which contribute to the occurrence, severity, and remediation of illness and disease.

PSYC 585 Abnormal Psychology (3)
Prerequisite: 6 hours of psychology.
An introduction to nature and causes of maladjusted behavior; emphasis on factors which may affect personality development.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

PSYC 600 Research in Cognition (1-3)
Prerequisite: Consent of Area Coordinator.
Supervised research on topics in cognition. May be repeated.

PSYC 601 Research in Social Psychology (1-3)
Prerequisite: Consent of area coordinator.
Supervised research on topics in social psychology. May be repeated.

PSYC 602 Research in Perception and Sensory Physiology (1-3)
Supervised research on topics in perception and sensory physiology. May be repeated.

PSYC 603 Thesis Guidance (1-6)
Prerequisite: Consent of instructor.
Research leading to master's degree, to be planned and carried out under the guidance and direction of a committee of faculty members.

PSYC 604 Independent Study (Reading) (1-6)
Prerequisite: Consent of instructor.
Pass/Fail grading.

PSYC 605 Independent Study (Research) (1-6)
Prerequisite: Consent of instructor.
Pass/Fail grading.

PSYC 606 Professional Development Lab (1-3)
Prerequisite: Clinical psychology program
An orientation course for newly enrolled graduate students in clinical psychology. Covers tools needed to succeed in graduate school (e.g., computer technology and library skills), introduces faculty research areas, provides discussion of issues related to clinical supervision and ethical behavior, and provides students with assistance in developing and implementing research ideas for their thesis projects.

PSYC 607 Computer Applications in Psychology I (1-3)
Prerequisite: PSYC 514 and 611 (may be taken concurrently) or consent of instructor.
An introduction to computer systems, program languages, and existing analysis packages as used in psychological research and applications.

PSYC 608 Computer Applications in Psychology II (3)
Prerequisite: PSYC 607 or consent of instructor.
A survey course of advanced uses of computers as research tools. Simulation techniques, including data structures, Monte Carlo techniques, and random-number generation; artificial intelligence; laboratory control; numerical methods.

PSYC 609 Topical Seminar in Psychology (3)
Prerequisite: Major in psychology or related area and consent of instructor.
Seminars dealing with interdisciplinary issues of modern psychology. Subject matter to be indicated in semester schedules. 3 hrs. lect., 3 hrs. lab.

PSYC 611 Advanced Statistics II (3)
Prerequisite: PSYC 514.
A second course for graduate students in experimental design and statistical analysis.

PSYC 612 Advanced Statistics III (3)
Prerequisite: PSYC 514 and 611.
Develops a facility on the part of the student in the application of the techniques of multivariate analysis of variance, regression analysis, multidimensional scaling.

PSYC 613 Research Design and Methods (3)
Prerequisite: PSYC 514, 606, and 611, or consent of instructor.
Intensive analysis of designs and methods for laboratory and field research. Topics include experimental, quasi-experimental, and correlational research. Fall.

PSYC 614 Advanced Multivariate Modeling (3)
Prerequisite: SOC 610 or PSYC 612 or equivalent.
Note: Cross-listed with SOC 616.
Multivariate statistical techniques in both theoretical and applied sociological research settings.

PSYC 620 Human Learning (3)
Prerequisite: Consent of instructor.
Analysis of basic concepts and techniques of conditioning and discussion of major theoretical issues.

PSYC 621 Cognitive Processes (3)
Prerequisite: Consent of instructor.
Discussion of attention, memory, thinking, and concept learning; language; and problem solving.

PSYC 622 Proseminar in Cognition (1-3)
Prerequisite: Consent of Area Coordinator.
Critical study of theory and research in cognitive psychology. May be repeated.

PSYC 624 Language and Cognition
Prerequisite: PSYC/LING 524
Note: Cross-listed with LING 624
Examination of theory and research on the relationship between fundamental processes of cognition and linguistic processes, e.g., organization of thought, memory, discourse, and text. Fall-spring, alternate years.

PSYC 626 Training and Skill (3)
Prerequisite: PSYC 620, 621, or consent of instructor.
Survey of research and theory in the analysis of human skilled performance and in the applied psychology of skill acquisition.

PSYC 632 Principles of Visual Science (3)
Prerequisite: PSYC 543 and 631 or consent of instructor.
Note: Cross-listed with VISC 602
An introduction of the structure and functioning of the visual system including normal and disrupted visual performance.
Surveys and integrates findings from neuroanatomical, electrophysiological, psychophysical and clinical research.

PSYC 633 Visual Processes (3)
A consideration of the low-level processes and mechanisms of seeing, including: (1) the sampling and filtering of the image in the eye, (2) the neural representation of the image, and (3) the interpretation of this representation. Emphasis is on form, color and motion abilities.

PSYC 634 Intermediate - Level Vision (3)
Intermediate Vision is a multidisciplinary subject. The following topics covered in this course will emphasis the integration of the various approaches such as psychophysics, cognition, neuroscience, computational theory, etc: Stereopsis and 3-D Space Perception; Texture Segregation and Visual Search; Visual Surface Perception; Structure from Motion.

PSYC 636 Human Memory (3)
Prerequisite: Two semesters of cognitive psychology.
Survey of major theories and research pertaining to memory, including memory disorders, memory development, and related cognitive processes.

PSYC 637 Thinking and Problem Solving (3)
Prerequisite: Consent of instructor.
Analysis of major research and theory pertaining to concept learning, deductive reasoning, and problem solving. Twice yearly.

PSYC 638 Decision Making, Judgment, and Choice (3)
Prerequisite: Consent of instructor.
Study of information processing and cognitive theories of decision making, judgment, and choice in both risky and nonrisky environments. Fall, spring, alternate years.

PSYC 641 Psychopharmacology (3)
Prerequisite: PSYC 542 and consent of instructor.
The effects of various classes of chemical compounds on experience and behavior.

PSYC 642 Behavioral Neuroscience (3)
Prerequisite: Consent of instructor or program director.
Survey of the neural and physiological factors which influence behavior.

PSYC 643 Principles of Neuroscience (3)
Prerequisite: PSYC 542 and 631 or consent of instructor.
A survey of the processes underlying the functioning of neurons and neural systems.

PSYC 644 Hearing (3)
Prerequisite: PSYC 543 and 631 or consent of instructor.
Survey of contemporary theory and research in audition, including psychophysical and physiological studies of auditory phenomena.

PSYC 648 Methods of Psychopharmacology (3)
Prerequisite: Consent of instructor.
Survey of behavioral techniques for assessing the effects of various classes of chemical compounds on behavior, with emphasis on experimental design, hypothesis testing, data collection, and statistical analysis.

PSYC 652 The Educational Applications of Psychology of Learning (3)
Prerequisite: Graduate standing in education or consent of instructor.
Survey of theory and experimental results emerging from the study of learning, especially operant conditioning, with discussion of applications to class and individual student control.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

PSYC 655 Law and Psychology (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with LAW 399.
The course emphasis is on seminar discussions of the mutual concerns of law and psychology (insanity defense, involuntary civil commitment, etc.).

PSYC 656 Legal, Professional, and Ethical Issues in Clinical Psychology (3)
Prerequisite: Clinical Psychology program or consent of instructor.
An examination of the ethical principles and professional issues in the field of clinical psychology, including aspects related to clinical research. Particular attention is paid to legal problems related to these issues.

PSYC 657 Environment and Behavior (3)
Prerequisite: PSYC 556, or three previous psychology courses and consent of instructor.
Effect of mechanical and physical stressors, such as heat, noise, and vibration, and the built and natural environment on work, performance, and life quality.

PSYC 661 Advanced Developmental Psychology (3)
Prerequisite: Consent of instructor.
Survey of the major areas of developmental psychology and of special problems encountered in research with infants and children.

PSYC 663 Human Growth and Development (3)
Prerequisite: Graduate standing in education or consent of instructor.
Central core of the course is the interest in heredity and environment in the course of development. Stress is placed upon the roles of early and continued cognition stimulation.

PSYC 670 Advanced Social Psychology (3)
Prerequisite: Social Psychology (PSYC 372) or consent of instructor.
Advanced study of major areas in social psychology: social learning, person perception, attitudes and attitude change, group dynamics, social structure, and change. Offered as needed.

PSYC 671 Social Psychology Proseminar (1-3)
Prerequisite: Consent of Area Coordinator.
Critical study of theory and research in major areas of Social Psychology. May be repeated.

PSYC 672 Social Psychology: Group Dynamics (3)
Prerequisite: Consent of instructor.
A lecture-demonstration course designed to instruct the student in theories, methodology, and content concerning behavior in small groups. Major topics are leadership, performance in groups, structural properties of groups, pressures to uniformity, power relations and influence, and membership variables.

PSYC 673 Advanced Personality Theory (3)
Prerequisite: PSYC 575 and consent of instructor.
A selective and critical examination of current theory and research in the area of personality.

PSYC 674 Organizational Psychology (3)
Prerequisite: Consent of instructor.
Structure and process in organizational development, internal communications, intraorganizational conflicts. Organization theory, consideration of various types of organizational setting: educational, military, institutional, business, and industrial.

PSYC 675 Social Psychology Methods (1-3)
Presentation and use of current methods in the field of social psychology. Emphasis on developing professional skills. May be repeated.

PSYC 676 Psychology of Sex Differences (3)
Prerequisite: Consent of instructor.
An analysis of the interaction of psychosocial and biogenetic factors in the determination of differences in the behavior of the sexes.

PSYC 679 Introduction to Assessment and Clinical Skills (1-3)
Prerequisite: Enrollment in Psychology Doctoral Program or permission of Director of Training.
A general introduction to psychological assessment, test development, psychometric theory, basic interviewing, legal considerations, theories of prediction and clinical judgment.

PSYC 680 Intellectual and Cognitive Assessment (3)
Prerequisite: PSYC 679 and clinical psychology program, or consent of Director of Training.
Administration, scoring, and interpretation of intelligence, aptitude, and academic achievement tests. Psychometric properties and applications are considered.

PSYC 681 Behavioral and Personality Assessment (3)
Prerequisite: Clinical psychology program or consent of Director of Training.
Covers administration, scoring, and interpretation of the MMPI/Rorschach (Exner system), and principles of cognitive and behavioral assessment techniques.

PSYC 683 Psychological Interventions I (3)
Prerequisite: Enrollment in Clinical Doctoral Program or permission of Director of Training.
Presents theory and techniques in one or more major therapeutic intervention orientations, along with considerations in applying these interventions such as special populations and varying modalities. Integrated laboratory allows students to apply techniques. Emphasis is on empirically validated techniques.

PSYC 684 Psychological Interventions II (3)
Prerequisite: PSYC 683 or consent of Director of Training.
Presents theory and techniques in one or more major therapeutic intervention orientations, along with considerations in applying these interventions such as special populations and varying modalities. Integrated laboratory allows students to apply techniques. Emphasis on empirically validated techniques. Continuation of PSYC 683.

PSYC 685 Clinical Psychology Practicum (1-3)
Prerequisite: PSYC 680 and clinical psychology program.
Supervised experience in psychological assessments and interventions utilizing various evaluation techniques and treatment approaches.

PSYC 686 Supervised Clinical Psychology Practicum (1-6)
Prerequisite: PSYC 685 and clinical psychology program.
Supervised experience for specialized problems or in particular techniques, typically for the most advanced students. May be repeated.

PSYC 687 Topical Seminar in Clinical Psychology (3)
Prerequisite: Consent of instructor.
Survey in depth of current theories, practice, and research in selected areas relevant to clinical psychology.

PSYC 689 Clinical Psychopathology (3)
Prerequisite: Consent of instructor.
A review of the causes and manifestations of psychopathology, with particular emphasis on the relevance of the research literature to the analysis and treatment of clinical cases. (Non-psychology majors must receive permission of instructor to enroll.)

PSYC 690 Practicum in College Teaching (1)
Guidance and training in college teaching of undergraduate psychology courses.

PSYC 691 Program Evaluation (2-3)
Review of issues and methods for the assessment of services or treatment efficacy, program effectiveness, and organizational performance in the health and human service areas. Prepares students for conceiving, planning and budgeting, reporting, and implementing program evaluations, need assessments, and client satisfaction studies. Includes preparation for application.

PSYC 692 Program Evaluation Project (1-2)
Prerequisite: PSYC 691.
Continues review of issues and methods covered in PSYC 691. Focus is on using the evaluation methods and organizational approaches reviewed in PSYC 691 for students to carry out actual program evaluation projects. Includes writing proposals, collecting and analyzing data, preparing reports, and working with organizations to help in the utilization of findings for organizational decisions and policies.

PSYC 693 Interviewing Skills Practicum (1)
Prerequisite: Acceptance into doctoral clinical program or consent of instructor.
For first-year clinical doctoral students to receive training in basic interviewing skills, on which all future assessment and psychotherapy skills build. Involves a series of skills modules and videotaped role-play interviews, culminating in a live client interview in the Psychological Services Center. Supervision and training in this course is provided by advanced doctoral students under the supervision of a faculty member.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

PSYC 694 Supervision Practicum (1)
Prerequisite: Enrollment in doctoral clinical program.
A companion course to PSYC 693. Students registered for this course will be fourth-year doctoral students (in exceptional cases, third-year student) who wish to develop their supervisory skills. Under the supervision of a faculty member, students registered for these courses will train first-year students acquiring interviewing skills in PSYC 693.

PSYC 696 Clinical Aspects of Child Psychopathology (3)
A review of current diagnostic and therapeutic techniques used by clinical psychologists in treating children. Spring.

PSYC 697 Psychotherapy Research (3)
Prerequisite: PSYC 683 or PSYC 684, or consent of instructor.
An examination of psychotherapy research designed to evaluate the current status of psychotherapy and to develop psychotherapy research techniques.

PSYC 701 Dissertation Research (1-12)
Prerequisite: Satisfactory completion of preliminary examination and permission of dissertation director.

PSYC 702 Advanced Topics in Psychology (3)
Prerequisite: Consent of instructor.
Survey and analysis of current theory and research in a specialized area of psychology.

PSYC 785 Clinical Psychology Practicum in Professional Settings (1-10)
Prerequisite: Clinical psychology program.
Experience in clinical psychology in professional settings under the supervision of professional clinical psychologists.

Public Administration (0590-PADM)

PADM 501 Managerial Statistics (3)
Prerequisite: Intermediate algebra.
Note: Cross-listed with MGMT 501.
A survey study of statistics, regression, ANOVA, and forecasting.

PADM 600 Public Administration and Organizational Behavior (3)
Note: Cross-listed with POLS 625.
An introduction to concepts and practices in public administration including: the constitutional context, the institutional environment, human resource development, individual and group dynamics, budgeting and finance, ethics, decision-making, and public-private interactions.

PADM 602 Analytic Methods for Public Professionals (3)
Provides students with the basic analytic tools commonly used by professional planners and public administrators in their daily practices. Instructs students in the tools, their underlying assumptions, strengths and weaknesses, and appropriate use. Students will also learn how to apply these tools to actual planning and public administration problems. The use of computers in applying these tools will be emphasized.

PADM 603 Policy Analysis and Evaluation (3)
Prerequisite: MGMT 501 or PADM 501.
The application of basic qualitative and quantitative methods for analyzing policy issues in the public and nonprofit sectors including: cost-benefit analysis, policy and program evaluation, decision-making tools, and ethical issues in policy research.

PADM 604 Public Budgeting & Finance (3)
Examines public budgeting and finance from economic, political, and institutional perspectives. Topics include: budget process, approaches and techniques of budgeting, ethics, intergovernmental fiscal relations, revenue-raising, capital budgeting, debt administration and risk management.

PADM 605 Strategic Management and Planning (3)
Note: Cross-listed with UPA 672.
Administration of the organization from the point of view of top level management. Formulation and administration of policies and practices. Development of long-range strategic plans as well as the diagnosis, analysis, and evaluation of specific organizational problems.

PADM 606 Public Policy (3)
Introduction to public policy, providing an overview of the formulation, implementation, qualitative evaluation, and ethical aspects of public policy. Political, legal and administrative institutions will be examined for their effect on the policy process, as well as, evaluated as to their capabilities to effectively implement and monitor policy.

PADM 607 Introduction to Urban Planning (3)
Provides students with an introduction to the field of urban planning through an overview of planning history, theory, process, and practice.

PADM 610 Administrative Law and Process (3)
Note: Cross-listed with POLS 615/UPA 662
Study of processes of law-making and application by governmental executive departments. Encompasses substantive issues facing agencies in designing and implementing effective regulation and court efforts to interpret and control agencies' activities.

PADM 611 Accounting for Public Administrators (3)
Focuses on users of state and local financial statements. Coverage includes: accounting and financial reporting for governmental units; budgetary accounting for general and special revenue funds, capital project funds, debt service funds, account groups, proprietary funds, and fiduciary funds; philosophy of auditing, the Single Audit Act, and the Yellow Book; and cost and managerial accounting.

PADM 620 Intergovernmental Relations (3)
An overview of the ways in which governmental policy, especially fiscal activities, may be used to shape the nature and form of activities at the local, state and federal levels.

PADM 622 Principles of Urban Design (3)
Note: Cross-listed with UPA 682.
Examines principles and techniques of designing large-scale spatial environments, and the relationship of urban images and physical form to human and natural environments. Introduces physical design processes.

PADM 623 Comparative Administration (3)
Formulation, implementation, management, and goals of public administration policies in different national settings.

PADM 624 Ethics in Public Administration (3)
Analyzes and explains the role of ethics for the practice of public administration. The development of ethical codes is traced from moral and constitutional roots. Course will include case studies and legal precedents.

PADM 626 Community Housing Policies (3)
Housing problems; housing policy and programs; and analytical procedures used in housing development planning.

PADM 627 Environmental Policy (3)
Basic factors in the physical ecology of communities; the impact of physical ecology on the quality of life; the ways whereby development policies can influence physical ecology.

PADM 628 Historic Preservation (3)
Problems of and procedures for identifying buildings and other physical entities with social, historical, and/or architectural value and the development and implementation of preservation policies.

PADM 629 Transportation Systems (3)
Analytical methods used by transportation planners; development of transportation plans, policies, and programs.

PADM 632 Special Topics in Urban and Regional Planning and Development (3)
Selected issues within the area of urban and regional planning and development. Specific subject will be indicated in the Schedule of Courses each term.

PADM 640 Studies in Urban Economics (3)
Note: Cross-listed with ECON 605/UPA 603.
The community as an economic system, the interrelationship of the local economy with the national and global economy, and the impact of economic change on local community life.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

PADM 642 Human Resources Management in Public and Nonprofit Organizations (3)
Note: Cross-listed with UPA 667.
Basic theories, public policies, laws, regulations, problems, and prospects of human resource development and management within the context of the public sector.

PADM 644 Collective Bargaining (3)
Current issues facing unions and employers in their relations with others, with emphasis on the substantive matters involved in negotiating contracts in both the public and the private sectors.

PADM 645 Planning and Implementing Urban Development (3)
Techniques and procedures involved in developing and effectuating a community urban development program, and the problems encountered in achieving a community consensus on goals and strategies.

PADM 646 Comparative Studies in Worker-Management Relations (3)
Forms of worker-management relations in various nations, with special attention given to the ways whereby workers and managers have developed forms of cooperation and consensus not commonly found in the United States.

PADM 647 Arbitration (3)
Role and function of arbitration in labor-management relations; analysis of the principles and practices of arbitration; laws governing arbitration processes; preparation of materials for arbitration cases; conduct of an arbitration hearing; preparation of arbitration findings.

PADM 648 Mediation and Dispute Resolution (3)
Designed principally for incipient practitioners of the mediation process. Class participation, serving as a mediator in cases presented to the class, and a short paper depicting mediating in process in operation are the course requirements.

PADM 649 Legal Aspects of Labor Relations (3)
Survey and analysis of labor relations laws that provide the framework for collective bargaining. Problems in administering and enforcing labor legislation.

PADM 651 Trade Unions (3)
Role of trade unions in the American economy; the organizational structure and operation of trade unions ranging from national to local units. Special problems facing contemporary unions.

PADM 652 Equal Opportunity and the Workplace (3)
Special problems women, the disabled, and minorities face in labor markets and on the job. The effects of various compensatory employment programs and policies in dealing with these problems.

PADM 653 The Public and Private Sectors in Urban Development (3)
The ways in which the behavior of the public and private sectors have influenced the levels and forms of urban development in communities and sub-communities; successful examples of private-public sector cooperation in the arena of integrated development.

PADM 654 Special Topics in Worker-Management Relations (3)
Prerequisite: Consent of instructor.
Selected issues within the general area of worker-management relations.

PADM 671 Special Topics in Public Policy Analysis (3)
Selected issue(s) in the general area of public policy analysis.

PADM 680 Independent Research in Public Administration (1-3)
Prerequisite: Permission of coordinator.

PADM 681 Independent Readings in Public Administration (1-3)
Prerequisite: Permission of coordinator.
A faculty-designed program of specific directed readings relating to understanding of community relations and community development. Written papers required.

PADM 682 Practicum/Internship (1-6)
Prerequisite: Permission of internship-practicum coordinator.

PADM 683 Topical Seminar in Public Administration (1-3)
Prerequisite: Permission of instructor.
Exploration of a specific topic or problem area in administration.

PADM 684 Advanced Research Methods (3)
Prerequisite: Permission of instructor.
Research designs, instrumentation and measurement, data collection strategies, analytic techniques, and the writing and evaluation of research reports.

PADM 686 Program Analysis and Evaluation (3)
Prerequisite: Permission of instructor.
Design and analytic strategies and tools for assessing and for projecting the impact of policies and programs.

PADM 688 Land Use and Planning Law (3)
Examination of pertinent legal issues, including ordinances, state and federal legislation, and court rulings impinging on planning and land use activities.

PADM 695 Thesis (1-6)
Prerequisite: Permission of internship-practicum coordinator.

Secondary Education (0771-EDSD)

EDSD 506 Exploring Teaching (6)
Focuses on human development and learning; sociological, political and cultural influences; educational theories, and curriculum and instruction issues. Twenty hours of classroom field work and twenty hours of community service field work required.

EDSD 511 Reading and Writing in Content Areas (3)
Prerequisite: 12 hours in education or psychology or consent of instructor.
Note: Cross-listed with EDEM 511.
A comparison of the developmental and the remedial reader at the middle and secondary levels, with emphasis on developmental instructional strategies, materials, and programs in middle and secondary content areas.

EDSD 540 Teaching Adolescent Readers (3)
Note: Cross-listed with EDEM 540.
Examines active reading processes, instructional strategies, and appropriate adolescent literature for teaching both the developmental and the remedial reader in secondary language arts.

EDSD 558 Methods of Teaching the Secretarial Subjects (3)
Prerequisite: Admission to Teacher Education, Human Development & Learning (ECPY 305), and EDSD 401/601.
Procedures, techniques, and materials used in the teaching of shorthand, typewriting, and related office skills. Must be taken prior to or concurrent with student teaching. Fall semester only.

EDSD 559 Comprehensive Business Methods (1-3)
Prerequisite: Admission to Teacher Education, Introduction to Studies in Education. (EDSD 201), Methods of Teaching in Secondary Education (EDSD 401), or Materials and Methods in Secondary Education (EDSD 601), Human Development and Learning (ECPY 305), and Teaching in the Middle Grades (EDSD 550).
For students in business education.
Note: Must be taken prior to or concurrent with student teaching.
Principles, methods, and materials used in teaching skill and non-skill business classes in middle grades and high school. Must be taken prior to or concurrent with student teaching.

EDSD 572 Microcomputer Uses in Education (3)
Note: Cross-listed with EDEM/EDTD 572.
Study of applications of computers in instruction: CAI, CMI, tutorials, simulations. Evaluation of preprogrammed materials. Fundamentals of BASIC programming. Current issues involving computer usage in schools.

EDSD 573 Computer Tools for Educators (3)
Prerequisite: EDEM/EDTD 572.
Note: Cross-listed with EDEM/EDTD 573.
Focuses on developing skills in using word processors, data base managers, and spreadsheets, and on applying these computer tools in educational settings.

EDSD 590 Teacher Institute on African-American Issues (3)
Note: Cross-listed with EDEM 590 and PAS 529.
An introduction to Pan-African Studies focusing on multicultural educational strategies for public school educators.

EDSD 591 Survey of African History and Culture for Teachers (3)
Note: Cross-listed with EDEM 591 and PAS 530.
An intensive survey of the history and culture of Africa (to 1600) for teachers.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDSD 592 Survey of African-American History and Culture for Teachers (3)
Note: Cross-listed with EDEM 592 and PAS 531.
An intensive survey of the history and culture of African-Americans for teachers.

EDSD 596 Special Topics in Secondary Education (1-4)
The investigation of special problems in education.

EDSD 601 Materials and Methods in Secondary Education (3)
Prerequisite: Admission to the M.A.T. program; admission to Teacher Education; Introduction to Studies in Education (EDSD 201) and Human Development & Learning (ECPY 305).
Surveys principles and practices of teaching in middle schools and junior and senior high schools.

EDSD 603 Foxfire Approach to Teaching (3)
Note: Cross-listed with EDEM 603.
Provides a thorough working knowledge of the philosophy and pedagogy found in the Foxfire approach, a learner-centered approach to classrooms. Prepares teachers at all levels to articulate, accept as valuable, and begin to develop the skills necessary to implement the core practices of the Foxfire approach. Designed for teachers of children, grades K-12.

EDSD 605 Pre-Student Teaching (6)
Prerequisite: Admission to the MAT and Grades 9-12 Professional Year Teacher Education Program; within six hours of completion of teaching major and/or minor or area of concentration.
Curriculum, instruction, assessment, media/technology and other current trends within and across content areas. Thirty hours of teaching, and fifteen hours of volunteer service required in addition to class time.

EDSD 606 Special Methods in Secondary School Teaching (3)
Prerequisite: Admission to the MAT and 9-12 Professional Year Teacher Education Program.
An application of methods and materials to teaching appropriately in specific content areas of certification.

EDSD 607 Student Teaching in the Secondary School I (4)
Prerequisite: Admission to MAT and Grades 9-12 Professional Year Teacher Education Program; EDSD 605 and EDSD 606.
Corequisite: EDSD 609 and EDSD 610.
Provides supervised observation, participation and teaching.

EDSD 608 Student Teaching in the Secondary School II (4)
Prerequisite: Admission to MAT and Grades 9-12 Professional Year Teacher Education Program; EDSD 605 and EDSD 606.
Corequisite: EDSD 609 and EDSD 610.
Provides supervised observation, participation and teaching.

EDSD 609 Student Teaching Seminar (3)
Prerequisite: Admission to MAT and Grades 9-12 Professional Year Teacher Education Program.
Corequisite: EDSD 607 and EDSD 608.
Develops students as teachers in the context of the student teaching semester. Students will reflect on their student teaching experiences and prepare for their employment as first-year teachers.

EDSD 610 Capstone Seminar (1)
Prerequisite: Successful student teaching and all education courses in MAT in Secondary Education.
Present professional portfolios, investigate current issues impacting the lives of students with and without disabilities, and assemble resources to further career goals. Fulfills exit requirement for Master of Arts in Teaching Secondary School Education degree.

EDSD 613 Remedial Reading in Grades 6-12 (3)
Prerequisite: EDEM/EDSD 511 or Teaching Reading in Elementary School (EDEM 406) or consent of instructor.
Note: Cross-listed with EDEM 613.
A study of diagnostic techniques, materials, and strategies for classroom remediation of reading problems at the secondary level.

EDSD 617 Louisville Writing Project (6)
LWP is aimed at the improvement of writing instruction at all levels. It includes an intensive summer program and follow-up activities during the academic year. The project also sponsors Advanced Institutes each summer.

EDSD 618 Introduction to Environmental Education (3)
Examines philosophical, historical, curricular and instructional issues pertaining to the environment and the concept of sustainable development and relates these to outcome-based education.

EDSD 619 Environmental Education Institute: The Study of Rural and Urban Watersheds (3)
Note: Cross-listed with EDEM 619.
Using a watershed as the focus, this course will examine the impact people have on the environment. Through field trips, community speakers, individual and group research, the students will document the aesthetic, cultural and ecological aspects of a watershed. Participants in the course will be able to use the approach modeled in the course with their students on any watershed.

EDSD 627 Teaching Structured Computer Programming (3)
Prerequisite: Experience teaching secondary math or science, or consent of instructor.
Methods for teaching structured computer programming in the secondary school. Emphasis on program design in a high level language. Each semester, language to be studied will be indicated in term schedule.

EDSD 629 Mathematics Curriculum in the Secondary School (3)
Prerequisite: A course in methods of teaching secondary school mathematics, experience teaching mathematics in middle or senior high school, or consent of instructor.
Factors in developing secondary school mathematics curricula are examined and applied, curriculum materials are investigated, and past and current trends in curriculum reform are analyzed.

EDSD 633 Human Interaction/Professional Growth (4)
Prerequisite: Introduction to Studies in Education (EDSD/EDEM 201), Human Development & Learning (ECPY 305), Methods of Teaching in Secondary Education (EDSD 601) and (EDSD 675), and admission to Teacher Education and the MAT.
Theory and field experience in communication skills useful in the teaching profession.

EDSD 634-636 Student Teaching in the Secondary School (4-4)
Prerequisite: Introduction to Studies in Education (EDSD/EDEM 201), Human Development & Learning (ECPY 305), EDSD 601, EDSD 675, and admission to the MAT and to Teacher Education; 2.50 overall grade-point average, 2.50 grade-point average in major teaching field and in professional education courses. Completion of 24 hours of teaching major is required; completion of entire teaching minor is required if student teaching is also to be done in the minor.
Provides supervised observation, participation, and teaching. To be taken concurrently with EDSD 633, EDSD 655 may be taken previously or concurrently.

EDSD 635 Action Research for Classroom Teachers (3)
Note: Cross-listed with EDEM 605.
Involves teachers in identifying questions about their own teaching & classroom situations, developing research methods appropriate for addressing those questions, and conducting a classroom-based study. PASS/FAIL ONLY.

EDSD 642 Secondary Instruction (3)
An exploration of current instructional strategies and practices in the secondary classroom, and an examination of the theories and learning principles which underlie them.

EDSD 644 Special Problems or Field Experience in Curriculum Development (1-6)
Intensive study of a current problem in an area of curriculum development or curriculum construction.

EDSD 645 Workshop in Secondary Education (4)
Deals with special topics in secondary education.

EDSD 646 Literature in the Secondary Language Arts Curriculum (3)
Prerequisite: Experience teaching English or language arts in the middle or senior high school, a course in methods of teaching English in the secondary school, or permission of instructor.
Note: Cross-listed with EDEM 646/ ENGL 646.
Examines theories behind the teaching of literature, research in teaching literature, and current trends in teaching literature in the secondary language arts or English class.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDSD 647 Teaching Writing and Language in the Secondary School (3)
Prerequisite: Experience teaching English or language arts in the middle or senior high school, a course in methods of teaching English in the secondary school, or permission of instructor.
Note: Cross-listed with ENGL 647/ EDEM 647.
Examines research, rationales, and methodology involved in teaching writing and language study (grammar, usage, vocabulary, spelling) in the secondary language arts or English Class.

EDSD 650 Science Education in the Schools (3)
Note: Cross-listed with EDEM 650. Examines socioeconomic, political, cultural, and other forces that have impact on the teaching of science in U.S. schools.

EDSD 652 Workshop in Science Education (1-6)
Note: Cross-listed with EDEM 652. A workshop dealing with materials and techniques in teaching science; includes development and evaluation of innovative and practical service projects using teaching strategies.

EDSD 654 Secondary Curriculum (3)
A study of foundation factors relevant to secondary curricula. Roles and responsibilities. Development of policies and practices for evaluating and improving the secondary program.

EDSD 655 Special Methods in Secondary Teaching (3)
Prerequisite: Admission to Teacher Education and MAT, Introduction to Studies in Education (EDSD/EDEM 201), Human Development & Learning (ECPY 305), and Methods of Teaching in Secondary Education (EDSD 601). A study of methods and materials in teaching appropriate to the major teaching field of the prospective secondary teacher. Fall semester only for all content areas except mathematics; spring semester only for mathematics content area.

EDSD 656 Science Education for Middle Schools (3)
Prerequisite: Teaching Science in the Elementary School (EDEM 404), or Teaching Science K-4 (EDEM 324), or Teaching Science in the Middle Grades (EDEM 419) or EDSD 556 or consent of instructor.
Note: Cross-listed with EDEM 656. Planning and designing individualized programs of teaching science; demonstration of teaching techniques; analysis of research related to science curriculum.

EDSD 657 Instructional Procedures in Science (3)
Note: Cross-listed with EDEM 657. Concentrates on newer methods and techniques for presenting materials (e.g., team teaching, learning stations, packets, contracting) as they apply to the science classroom.

EDSD 658 Science Curriculum in the Schools (3)
Prerequisite: EDEM/EDSD 650 or consent of instructor.
Note: Cross-listed with EDEM 658. Examines curriculum programs, the settings in which they are intended to function, and other considerations for building a school program in science.

EDSD 659 Current Issues in Science Education (3)
Prerequisite: EDEM/EDSD 650.
Note: Cross-listed with EDEM 659. Analyzes systems and forces that currently influence science education. Emphasizes creative solutions to the problems these forces create.

EDSD 662 Workshop in Social Studies Education (3)
Note: Cross-listed with EDEM 662. Experiences with content, techniques, and materials for teaching social studies in elementary and secondary schools. Offered each summer.

EDSD 664 Trends in Social Studies Education (3)
Note: Cross-listed with EDEM 664. A study of recent trends in social studies, recent developments and new methodologies in teaching social studies, examination of materials and projects especially prepared for social studies teachers.

EDSD 666 Consumer Economics in the Classroom (3)
Note: Cross-listed with EDEM 666. Includes consumer topics, behavior and problems. Teaching strategies and materials appropriate for teaching consumer education will be emphasized.

EDSD 667 The Media & Consumer Education (3)
Note: Cross-listed with EDEM 667. Examines mass media with special attention to marketing and advertising principles and practices. Directly applies these principles and practices to the elementary and secondary curriculum.

EDSD 668 Workshop in Economic Education (3)
Note: Cross-listed with EDEM 668. Basic economic content, techniques and materials for integrating economics into elementary and secondary subjects.

EDSD 669 Economic Education Curriculum and Teaching (3)
Note: Cross-listed with EDEM 669. Examines economic content, materials and strategies. Economic education teaching units are developed, taught and evaluated.

EDSD 675 Instructional Media (3)
Demonstration and utilization of instructional media (hardware and software), including films, film strips, slides, transparencies, audio and video recordings, and computers.

EDSD 677 Development of Television Instruction (3)
Analysis and use of techniques of televised presentation in development of prototype instructional programs.

EDSD 696 Independent Study in Secondary Education (1-3)
By arrangement with dean and advisor.

EDSD 698 Supervised Readings in Educational Literature (1-3)
By arrangement with dean and advisor.

EDSD 699 Thesis or Professional Paper (2-5)
Prerequisite: EDFD 600 or equivalent; consent of dean and advisor.

EDSD 712 Seminar in Teaching and Learning (3)
Prerequisite: 6 graduate hours in curriculum and instruction; and consent of instructor.
An advanced study of classroom practices and the social and psychological theories behind such practices.

EDSD 730 Internship in Teaching and Learning (3)
Required of every doctoral student in the Teaching and Learning Option of the Supervision program. Student submits a prospectus to the major advisor outlining a minimum of one semester's work in an internship related to the student's area of concentration.

EDSD 740 Seminar in Curriculum Theory and Design (3)
Prerequisite: An introductory course in curriculum or consent of instructor.
Note: Cross-listed with EDEM 740. An advanced study of theories of curriculum structure and content; recent research and implications for curriculum design.

EDSD 750 Language, Learning and Teaching (3)
Provides a review of theories of language acquisition, philosophies of language and grammar, and theories of learning. These theories will be examined in the light of their relationship to teaching, curriculum and the learner.

EDSD 751 Language, Learning and Culture II (3)
Prerequisite: EDSD 750.
Continuation of the review of theories of language acquisition, philosophical and grammatical theories, and theories of learning. These theories will be examined in the light of their relationship to teaching, curriculum, culture, the learner, and education reform, KERA specifically.

EDSD 770 Seminar in Teaching and Learning (3)
Prerequisite: Near the end of the doctoral program and by permission of instructor (for students in supervision subspecialty).
Provides an information base in the field of interest, opportunities to explore recent innovations in Supervision, and practice in evaluating selected supervision strategies.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Social Sciences (0388-SOCS)

SOCS 542 Historic Louisville (3)
A course in the history of Louisville, including political, economic, and social development. Offered as needed.

Social Work (4750-SW)

Master of Science in Social Work
SW 603 Human Diversity (3)
Foundation course designed to provide students with the knowledge and skills for social work practice with people who are subject to various forms of oppression such as racism, sexism, heterosexism, classism, ageism, and ableism operating at the individual, community and institutional levels of society. Cultural diversity and strengths are emphasized. Developing greater professional and personal awareness about the impacts of various forms of oppression are addressed.

SW 604 Social Work Practice I (3)
Prerequisites: Concurrent registration in SW 670
Introduction to knowledge, principles, values, and skills for social work practice. Introduction to generalist practice.

SW 605 Social Work Practice II (3)
Prerequisites: Successful completion of SW 604 and concurrent registration in SW 671
Introduction to knowledge, principles, values, and skills for social work practice. Continuation of conceptualization of general practice.

SW 619 Human Transactions in the Social Environment (3)
Prerequisites: Successful completion of SW 601
Analysis of the social, culture, and economic systems that exert influence on human transactions.

SW 622 Issues in Policy and Service Delivery (3)
Prerequisites: Successful completion of SW 602
Analysis of the interrelationship between problem conceptualization, policy options, and the impact on social work practice.

SW 623 Social Work Research Methods (3)
Provides students the foundation knowledge for scientific inquiry. Covers all aspects of the research process from problem formulation to writing the research report. Introduces students to qualitative, quantitative, and single-subject methods of conducting research. Ethical issues associated with conducting research are addressed. The uses of research to inform practice, policy, and to promote social justice are considered.

SW 624 Social Work Research Applications (3)
Focuses on preparing students to evaluate their practice with individuals, families, groups, and communities by applying specific qualitative and quantitative research methods.

SW 625 Children and Families
Focuses on practice with children and families within an ecological framework. The complexity of practice with children and families within various human service delivery systems is examined.

SW 626 Research Methodology and Design (3)
Prerequisites: Successful completion of SW 601-604 and SW 670
Provides students with an understanding and appreciation of a scientific, analytic approach to building knowledge for practice and for evaluating service delivery in all areas of practice. Presents content on ethical standards of scientific inquiry and introduces students to qualitative and quantative research methodologies, analysis of data, including statistical procedures and systematic evaluation of practice.

SW 640 Advanced Direct Practice I (3)
Prerequisites: Successful completion of SW 605 and concurrent registration in SW 672
Prepares students to understand and develop skill in a specially crafted social work practice centering on the metaphor of narrative. Consistent with the Structural Approach and strengths-oriented concepts that characterize the Kent School foundation generalist practice, which eschews deficit-based and victim-blaming orientations, Kent School narrative practice is a strength-based, emancipator, social justice-oriented approach to helping people with their personal and interpersonal struggles. Students will also examine the cultural practices other than narrative in the second term.

SW 641 Advanced Direct Practice II (3)
Prerequisite: Successful completion of SW 640 and concurrent registration in SW 673
Builds on its antecedent concepts and skills. Students learn to think about and approach metawork--the work about the work--from a narrative perspective. Using a framework of analytic dimensions, students learn to analyze and deconstruct current practices including their own, and they learn to supervise and teach other practitioners to develop basic understanding and skills in helping people.

SW 642 Psychopathology (3)
Focuses on clinical use of diagnostic classification of psychopathology while preparing students for clinical work. Course is taught with a social work perspective that incorporates associated concepts of labeling theory and strengths perspective.

SW 668 Advanced Research Practice I (3)
Prerequisite: Successful completion of SW 626.
Prepares students to examine and evaluate their practice using multiple methodologies. A critical examination of the methods and tools for evaluation of practice with individuals, families, groups, and communities is undertaken. Strategies for developing and implementing proposals for evaluating practice are considered.

SW 669 Advanced Research Practice II
Prerequisite: Successful completion of SW 688
Prepares students to conduct and implement their own research projects focused on evaluating practice. Students will analyze, interpret, and present research findings. The implications of findings in informing and shaping practice are considered.

SW 691 Advanced Macro Practice I: Supervision, Training and Program Design/Evaluation (3)
Prerequisites: Successful completion of SW 605 and concurrent registration in SW 672
Oriented to concepts of learning, competence, motivation and growth. Examines verbal and experiential methods through which persons develop on the job and professionally. Aspects of supervising and instructing one-on-one or through groups are examined and learned through a transactional emphasis that will apply to either career role: supervise/trainee or supervisor/trainer. Aspects of program/project design, implementation and evaluation also will be covered. Equips the student to carry a training, supervising, and programming role effectively whether the context is work with clients, staff and/or volunteers in various organizational community situations.

SW 692 Advanced Macro Practice II: Management and Advanced Policy Analysis (3)
Prerequisite: Successful completion of SW 691 and concurrent registration in SW 673
Examines theoretical and empirical literature on complex organizations and administrative practices in order to increase participants' understanding of contemporary problems, issues, and practices in the administration of human service delivery systems. Emphasis is placed on basic skills in analyzing organization variables, identifying organizational/administrative problems affecting social work practice and service delivery, strategic planning and management, and basic techniques in goal setting, decision making, conflict management, program and policy development and budgeting. Analysis of demographic, political, economic and other influences upon policy development and evaluation is also covered. Emphasis is given to developing analytical models for studying policy development, formulation, implementation, and the evaluation of its effectiveness.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Doctoral Program

SW 751 Social Work Research I: An Overview (3)
Helps students understand the basics of research and statistical procedures so they are prepared to move through the additional research and statistical procedures in the doctoral program. Course will be approached from a dual perspective of client outcomes and program evaluation.

SW 752 Statistics and Analysis Methods for Social Work I (3)
Helps students understand and apply basic statistical techniques and analysis methods to the types of data generated in social work research. Focuses on both introductory quantitative and qualitative analyses of social work research data. Examines basic methods for quantitative and qualitative analysis including parametric and nonparametric techniques. Qualitative analyses, including methods for analyzing documents, unstructured interviews, written texts, and laws and court opinions are addressed, drawing upon a broad range of social work applications.

SW 753 Social Work Research II: Advanced Research (3)
Prerequisite: Social Work Research I
Focuses on the critical issues and value judgments involved in evaluating social service interventions and programs. Examines qualitative and quantitative methodologies as ways of conducting formative and summative evaluations.

SW 754 Statistics for Social Work II (3)
Prerequisite: Statistics for Social Work I
Introduction to advanced multivariate analytic techniques. Topics include regression analysis, factor analysis, multiple comparisons, canonical correlation, event history analysis and meta analysis as applied to social work research data.

SW 755 Theory Development in the Social Work Profession (3)
Explores the nature of knowledge and how it is generated and acquired. Examines explanatory and practice theory, current models related to practice, and the relationship of theory and data to social work. Strategies for building knowledge will be discussed. Students will analyze theories into their components, construct minitheories, and propose how they can be tested in social work practice.

SW 756 Professional Seminar I (1)
Introduces doctoral students to social welfare policy and research interests of the faculty, particularly research in its early stages of conceptual development. Explores practical issues in the conceptual development and conduct of research providing students with a possible research agenda.

SW 757 Advanced Analysis of Social Welfare Problems (3)
Provides students with a theoretical and conceptual framework for understanding social problems and their implications for macro social work practice. Critical perspectives related to social science theory will be identified, assumptions assessed, values examined, and empirical evidence analyzed. Covers theories from sociological, socio-cultural, political, economic, historical, and other perspectives. Helps students to develop their abilities to analyze and critique social problems and macro social work practice.

SW 758 Professional Seminar II (1)
Prerequisite: Professional Seminar I
Continuation of Professional Seminar I.

SW 759 Human Behavior and Change Theories in Social Work Practice (3)
Provides a critical analysis of theories which seeks to explain human behavior and serves as a foundation for current clinical change interventions. Examines empirical support for and efficacy of major treatment modalities.

SW 760 Ethics, Social Work and Society (3)
Identifies and articulates the philosophical formulations of relevant ethical traditions and their implications for social work. Examines approaches to ethical analysis and major ethical problems facing contemporary social work. Emphasizes the development of advanced ethical reasoning and decision-making skills.

SW 761 Research in Social Work Seminar (3)
Prerequisite: Successful completion of the qualifying examination.
Facilitates the student's completion of the dissertation prospectus and the dissertation itself. Students make formal presentations on their research plans addressing available literature, measurement and methodological issues, analysis of data, limitations, and the importance of investigation.

SW 762 Research Practicum (3)
Prerequisite: Consent of instructor.
Hands-on experience in the conception and implementation of a project, and/or data collection and analysis by working directly with faculty who are engaged in research.

SW 763 Teaching Practicum (3)
Prerequisite: Consent of instructor.
Experience in planning and teaching a social work course including classroom teaching and evaluation of students' work.

SW 764 Teaching in Social Work (3)
Engages students in the philosophy of education with emphasis on professional education, curriculum theory and social work curriculum standards, and instructional theory, methods and technology. Each student will create a social work course from initial surveying of a body of relevant literature, choosing content and conceptualizing it, developing lectures, and inventing educational tasks and assignments.

SW 797 Independent Study (3-12)
Independent studies for doctoral students.

SW 798 Special Topics in Social Work (3-12)
Special or emerging topics that may not be appropriate for a permanent course, i.e., implications of changes in curricula required by the Council on Social Work Education (CSWE).

SW 799 Dissertation (1-18)
Prerequisite: Satisfactory completion of the qualifying examination and permission of dissertation director.
Research on dissertation project.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

Sociology 0392-SOC)

SOC 500 Special Topics (3)
Prerequisite: Nine hours of core courses or consent of instructor.
Exploration of well-defined topics in sociology not treated in regular courses. Topic will be announced in Schedule of Courses.

SOC 501 Special Topics in Urban Analysis (3)
Prerequisite: Consent of instructor.
A study of selected issue(s) within the general area of urban sociology.

SOC 502 Special Topics in Demography (3)
An introduction and application of demographic theories, concepts, data, and measures to multiple disciplines.

SOC 503 Political Sociology (3)
Focuses on the theoretical and empirical issues pertaining to the relationship between political processes, political structures, the state, and society.

SOC 504 Special Topics in Penology and Criminology (3)
Prerequisite: Consent of instructor.
Focus on one or more issues in the general field of corrections and/or criminology. Offered as needed.

SOC 505 Special Topics in Sociology of the Family (3)
Prerequisite: Consent of instructor.
Analysis of contemporary issues of familial behavior and the empirical study of such behavior. Offered as needed.

SOC 508 Social Networks: Concepts, Techniques, and Applications (3)
Prerequisites: Consent of instructor.
Network concepts, measurement, and analysis. Wide usefulness illustrated by examination of acquaintance networks, patterns of communication, business transactions, kinship ties, influence and authority relationships, etc.

SOC 510 Computerized Data Analysis (3)
Prerequisite: Principles and Concepts of Sociology (SOC 209), Introduction to Sociology Statistics (SOC 301), and Introduction to Research Methods (SOC 303), or consent of instructor.
Multivariate statistical analyses, focusing on multiple regression using standard computer packages (e.g., SPSS-X, SAS) operating in the VM/SP environment.

SOC 511 Marxist Social Theory (3)
Prerequisite: Consent of instructor.
Introduction to Marxist social theory. Attention will be paid to both "classical" and recent approaches within this tradition.

SOC 521 Social Transformation in Eastern and Central Europe (3)
Prerequisite: Nine hours in sociology or consent of instructor.
Using classical and contemporary theories of social change, this course explores the causes, nature, and extent of transition taking place in the social, political, and economic sectors of states in Eastern and Central Europe.

SOC 550 Voluntarism (3)
Prerequisite: Principles and Concepts of Sociology (SOC 209), Social Theory (SOC 320), and Diversity and Inequality (SOC 323); or consent of instructor.
Investigation of issues and topics related to voluntary activity. May also include contact with voluntary organizations in the local community.

SOC 600 Thesis or Internship Report (1-6)

SOC 601 Topical Seminar in Sociology (3)
An exploration of a specific topic or problem area of importance in contemporary sociology.

SOC 602 Independent Study (Readings) (1-5)

SOC 603 Independent Study (Small-Scale Research Problem) (1-5)

SOC 604 Proseminar in Sociology (1)
Designed to provide new graduate students with an introduction to sociology as a profession and to the Department of Sociology.

SOC 610 Seminar in Statistics (3)
Prerequisite: SOC 510.
Review of multivariate analytic techniques and a brief introduction to modeling procedures in the social sciences. Students will be instructed in the use of SPSS procedures and are expected to employ these in their seminar work. A laboratory period will be required.

SOC 615 Seminar in Research Methodology (3)
Intensive review of research design, instrumentation, survey procedures, data collection and processing techniques, analysis, and report writing.

SOC 616 Advanced Multivariate Modeling (3)
Prerequisite: SOC 610 and 615.
Note: Cross-listed with PSYC 614
Multivariate statistical techniques in both theoretical and applied sociological research settings.

SOC 617 Program Evaluation and Impact Analysis (3)
Prerequisite: SOC 610 and 615.
Note: Cross-listed with UPA 621.
Evaluation of social programs through experimental and quasi-experimental design, multi-variate models, instrumentation, and impact analysis.

SOC 618 Qualitative Field Research Methods (3)
Prerequisite: SOC 615 or Ed.D. student, or consent of instructor.
Note: Cross-listed with EDFD 704.
Provides opportunities to design and critique field studies in educational and social settings and to practice techniques used to collect and analyze qualitative. Additional time required outside class for observations and interviews.

SOC 619 Fundamental Assumptions of Sociology (3)
Implicit and explicit assumptions including the character of science, paradigms, evolution, humans, and groups that are common to all areas of sociology.

SOC 620 Seminar in Sociological Theory (3)
Note: Crosslisted with EDFD 704.
Analysis and integration of the important writings of the major theorists in contemporary sociology.

SOC 630 Seminar in the Sociology of Education (3)
Prerequisite: Consent of instructor.
Nature and function of mass education in modern society. Issues of politics of skill, dissemination of knowledge and values, and socialization. Focus on the school in urban society and as an instrument of social control, policy, and change.

SOC 631 Sociology of Work and Occupations (3)
The use of sociological theory in the study of industrial society. The social organization of work, alienation, labor relations, personnel policy, the impact of industrialization on social life and culture.

SOC 635 Seminar in Social Movements (3)
Advanced study of the major theoretical perspectives and debates in the examination of groups working to effect social change.

SOC 636 Seminar in the Sociology of Human Sexuality (3)
Advanced study of the historical, cultural, structural, and social-psychological factors affecting human sexual expression.

SOC 640 Seminar in Urban Sociology (3)
Systematic critical examination of the history and application of social theory to the urban place. Specific attention is given to the utility of classical and contemporary theory in predicting and explaining human behavior in the urban environment.

SOC 650 Seminar in Sociology of the Family (3)
Study of the institution of the family, including intensive analysis of selected aspects of family group processes. Students are expected to carry out a small scale research study of family behavior.

SOC 660 Seminar in Crime and Correction (3)
An intensive theoretical analysis and/or field investigation of selected aspects of criminal behavior, juvenile delinquency, penal philosophy, correctional institutions, and/or probation and parole.

SOC 661 Comparative Criminology (3)
A cross-cultural study of criminal behavior with special emphasis on crime causation.

SOC 670 Seminar in Advanced Demography (3)
Prerequisite: Population Studies (SOC 462) or SOC 502. Advanced study in topics related to population structure, composition, distribution, size, change, and growth.

SOC 680 Seminar in Social Stratification (3)
Critical analysis of sociological theories of and research in social inequality and social stratification. Discussion of classical and modern works. Focus on the concept and reality of social class.

SOC 685 Seminar in Race and Ethnicity (3)
Current and historical issues in race, racism, and ethnicity. Focus on U.S. with reference to other societies.

Spanish (0395-SPAN)

At least two courses on the 500 or 600 level will be offered for graduate students every semester. Course offerings are contingent upon sufficient enrollments. Regularly scheduled 500-level courses may be replaced by seminars, or studies of particular authors or specific topics.

SPAN 500 Spanish Study Abroad (1-15)
Prerequisite: Membership in a University of Louisville Language Study Abroad Program or a program approved by the department.
Credit awarded upon demonstration of successful completion of program undertaken with prior approval of the department, including a paper or project and an oral or written examination in the language and culture, administered under the supervision of a faculty member.

SPAN 503 Main Currents in Spanish Literature I (3)
Prerequisite: Writers of the Hispanic World (SPAN 335), or other training in reading literary texts.
A study of major authors and movements in Spanish from the Middle Ages to the 17th century.

SPAN 504 Main Currents in Spanish Literature II (3)
Prerequisite: Writers of the Hispanic World (SPAN 355), or consent of instructor.
Major authors and movements in Spanish literature from the 18th century to the present.

SPAN 505 Main Currents in Spanish-American Literature I (3)
Prerequisite: Writers of the Hispanic World (SPAN 355), or other training in reading literary texts.
Survey of major literary trends and authors of Spanish America from the Cronicas to early Modernism (1492-1880).

SPAN 506 Main Currents in Spanish-American Literature II (3)
Prerequisite: Writers of the Hispanic World (SPAN 355), or other training in reading literary texts.
Survey of major literary trends and authors of Spanish America from Modernism to the present (1880-present).

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

SPAN 511 Studies in Spanish Medieval Literature (3)
Prerequisite: Consent of instructor.
Special studies in the original language of selected works from the medieval period.

SPAN 513 Studies in Spanish Golden Age Literature (3)
Prerequisite: Consent of instructor.
Intensive study of significant works of the Spanish Golden Age.

SPAN 516 Literary Influences in Nineteenth-Century Spanish (3)
Prerequisite: Consent of instructor.
Study of significant writers of the Spanish Romantic, Realistic, and Naturalistic periods.

SPAN 517 The Introspective Generation (3)
Prerequisite: Consent of instructor.
Study of significant works from the Generation of 98 to Pre-Civil War Spain.

SPAN 518 Studies in Twentieth-Century Literature of Spain (3)
Prerequisite: Consent of instructor.
Study in depth of significant works of the Post-Civil War period.

SPAN 519 Studies in Latin American Contemporary Literature (3)
Prerequisite: Consent of instructor.
Intensive study of significant works from contemporary Latin America.

SPAN 522 Spanish Phonetics and Diction (3)
Prerequisite: 6 hours of Spanish at senior-college level or consent of instructor.
Pronunciation, diction, and intonation in theory and practice. Corrective exercises, recordings for the analysis of individual pronunciation problems. Poetry and prose studied in phonetic transcription, using the International Phonetic Alphabet, extemporaneous speaking and prepared readings.

SPAN 523 Advanced Composition and Conversation (3)
Prerequisite: Spanish Conversation (SPAN 321) and Spanish Composition (SPAN 322) or consent of instructor.
An upper-division and graduate-level course in oral and written expression in Spanish. Emphasis on oral and written reports, stylistic training, intensification of vocabulary.

SPAN 525 Spanish for the Classroom Teacher (3)
Prerequisite: Admission to graduate education program.
Note: Does not apply to M.A. in Spanish.
Elements of Spanish language and culture for prospective and in-service elementary and secondary teachers for the purpose of enrichment in the regular classroom.

SPAN 528 Contemporary Spanish-American Theatre (3)
Prerequisite: Writers of the Hispanic World (SPAN 355), or other training in reading literary texts.
Major trends and authors in Spanish-American theatre since c. 1950. Critical methodology for theatre.

SPAN 529 Spanish American Poetry (3)
Prerequisite: Writers of the Hispanic World (SPAN 355).
Selected Spanish American poets, movements and national traditions. Critical methodological theory.

SPAN 530 Spanish American Narrative (3)
Selected Spanish American novelist and short story writers, movements and national traditions. Critical methodological theory.

SPAN 561 Independent Study (1-3)
Prerequisite: Consent of department.
Independent study in areas not covered in the regular curriculum.

SPAN 599 Special Topics (3)
Prerequisite: Consent of instructor.
Topics of a unique or specialized nature in Spanish language, literature or culture.

SPAN 621 History of the Spanish Language (3)
Prerequisite: Consent of instructor.
Evolution of the Spanish language from earliest times to present. Linguistic analysis of representative literary and non-literary texts.

SPAN 622 Comparative Romance Philology (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with FREN 622.
Comparative phonological and morphological study of the Romance languages from earliest times to the present, with special attention to the formative years.

SPAN 624 Spanish Applied Linguistics (3)
Prerequisite: Consent of instructor.
A course designed especially for Spanish teachers; will deal with the phonology, morphology, syntax, and semantics of contemporary Spanish. The pedagogical implications of linguistic analysis will be discussed in depth.

SPAN 670 Special Topics (3)
Prerequisite: Consent of instructor.
Selected topics in Spanish language, literature, or culture. Topics chosen will reflect the needs of the students and the background of the instructor. May be repeated under different subtitles.

SPAN 690 Thesis (3-6)

Special Education (0785-EDSP)

EDSP 528 Assessment Procedures for the Visually Impaired (3)
Prerequisite: Introduction to Special Education (EDSP 180), EDSP 509, EDSP 510 and EDSP 525.
Analysis and evaluation of the assessment process for children with visual impairments in academic and social behavior areas.

EDSP 529 Student Teaching of the Visually Impaired (4)
Prerequisite: Consent of instructor.
Observation, participation, and teaching under supervision in a school for the blind, resource room, or regular classroom having legally blind students.

EDSP 536 Language Development and Language Disorders (3)
Study of language development from infancy through adolescence. Relates language to adaptive and personal-social growth.

EDSP 537 Language Learning for Exceptional Children (3)
Prerequisite: EDSP 536 or consent of instructor.
Delineates and describes language learning patterns commonly found in relation to specific impairing conditions. Emphasizes specific language learning methods and materials appropriate for these problems.

EDSP 540 Introduction to Exceptional Children (3)
Prerequisite: Human Development & Learning (ECPY 305) or Developmental Psychology (PSYC 361).
A survey course designed to acquaint students with all types of exceptional children--physically and mentally handicapped, socially and emotionally disturbed, and the gifted; methods of adapting education to meet the needs of these children.

EDSP 541 Introduction to Learning and Behavior Disorders (3)
An integration of theoretical, conceptual, and applied educational systems for children with learning and behavior disorders.

EDSP 545 Exceptional Children in the Regular Classroom (3)
Prerequisite: EDSP 540.
Educational programming for exceptional children in regular classrooms; curricular approaches in mainstreaming.

EDSP 578 Practicum in Teaching the Trainable Mentally Retarded (4)
Prerequisite: EDSP 540, 570 and 586.
Supervised student teaching of trainable mentally retarded children.

EDSP 586 Diagnostic and Prescriptive Teaching of Moderately Retarded Individuals (3)
Prerequisite: EDSP 570.
Analyzes assessment techniques and explores prescriptive programming for moderately retarded persons from infancy to adulthood. Diagnostic and prescriptive programming experience provided in field-based practicum.

EDSP 594 Problems and Methods of Teaching the Physically Handicapped and Sensory Impaired (3)
Prerequisite: EDSP 540 or faculty consent.
Surveys the causes and educational implications of physical handicaps (cerebral palsy, spina bifida, etc.) and sensory impairments (vision and hearing).

EDSP 596-597 Seminar in Special Education (1-4)
The investigation of special problems in education.

EDSP 610 Administration and Supervision in Special Education (3)
The development, coordination, administration, and supervision of special services for exceptional children.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDSP 612 Curriculum Methods and Assessment I (3)
Prerequisite: EDSP 537 and 541.
Introduces basic concepts in special education assessment; provides an overview of instructional methodology used in teaching students with disabilities.

EDSP 613 Curriculum Methods and Assessment: Field Component I (3)
Prerequisite: EDSP 537, 541, 612, 675; EDEM 610, 620
A variety of standardized and criterion referenced tests will be examined. Their role in assessing intellectual ability, academic performance, social, and emotional skills will be presented. Functional assessment will also be explored. In addition, curriculum and teaching strategies for students with learning and behavior disorders will be addressed.

EDSP 614 Transition Programs and Services for Children and Youth With Disabilities (3)
Prerequisite: EDEM 610; EDSP 537, 541, 612, 613, 616, 617, 675.
Addresses the needs of personnel working with secondary special education students making the transition from school to adulthood. Provides information on the basic adult needs of persons with developmental disabilities, an interdisciplinary service model to meet those needs, and systematic planning and coordination of services that are required for persons with disabilities to achieve maximum quality of life.

EDSP 615 The Normalization Principle in Human Service Systems (3)
Analyzes normalization principle in relation to education and other human service systems. Emphasizes evaluation of educational, residential, and community services for mentally retarded and other exceptional individuals.

EDSP 616 Curriculum Methods and Assessment II (3)
Prerequisite: EDSP 541, 612, 613; EDEM 610.
Focuses on instructional methods, materials, and assessment in the areas of literacy, math, social skills, and content areas for students with learning and behavior disorders.

EDSP 617 Curriculum Methods and Assessment: Field Component II-Student Teaching (3)
Prerequisite: EDSP 537, 541, 612, 613, 616, 617, 618, 675, 693.
Instructional methods, techniques, and materials will be examined. Students work directly with children and adolescents with learning and behavior disorders in order to gain an understanding of these youngsters, and evaluate their own qualifications for working with them.

EDSP 618 Instructional Technology for Students With Special Needs (3)
Prerequisite: EDSP 537, 541, 612, 613, 616, 617, 675, 693.
Designed to provide information about the use of instructional technology for students with learning disabilities.
Lectures, video presentations, and required readings will be combined to provide a basic foundation of skills.

EDSP 624 Educational, Physical, Psychological and Social Aspects of Visual Impairment and Blindness (3)
Prerequisite: ECPY 521.
Introductory course which considers the educational, conceptual, social psychological, and physical problems of visual impairment.

EDSP 625 Standard English and Nemeth Braille Codes (3)
Prerequisite: ECPY 511 and ECPY 521.
A programmed approach to standard English and the Nemeth Braille Code for Mathematics and Scientific Notation. Includes textbook format for mathematics and science.

EDSP 626 Educational Procedures for Low Vision Children (3)
Study common eye disorders, and their educational implications. Study of special methods, materials, and adaptations for visually impaired children with emphasis on those with low vision who use print as their learning/reading medium.

EDSP 627 Practicum in Blindness/Visual Impairment and Applications of Technology (3)
Provides active classroom involvement prior to student teaching with children and youth who have visual impairments. Opportunity to work interactively with technological applications in an educational setting.

EDSP 628 Seminar: Assessment of the Visually Impaired Students (3)
Discussion of special topics of educating visually impaired persons.

EDSP 629 Student Teaching with Visually Impaired Students (3)
Prerequisite: Consent of instructor.
Observation, participation, and supervised teaching in a school for the blind, resource room, itinerant program, or regular classroom having legally blind students.

EDSP 633 Curriculum and Methods for Early Childhood Special Education (3)
Prerequisite: EDEM 627.
Note: Cross-listed with EDEM 633.
Exploration of early childhood models, strategies, and materials appropriate for use with special needs children.

EDSP 634 Introduction to Mental Retardation (3)
Psychological, sociological and educational aspects of mentally retarded persons, emphasis on the diagnostic and prescriptive process related to alternative methods of educational programming; involvement in simulation modules and observation and participation in cooperating facilities.

EDSP 635 Moderate and Severe Disabilities Practicum (4)
Prerequisite: All other special education certification courses.
Provides supervised teaching experiences with trainable mentally handicapped students.

EDSP 636 Diagnostic/Prescriptive Teaching of Individuals with Moderate Mental Retardation (3)
Analyzes assessment techniques and explores prescriptive programming for moderately retarded persons from infancy to adulthood. Diagnostic and prescriptive programming experience provided in field-based practicum.

EDSP 637 Collaborative Consultation (3)
Prerequisite: All special education courses.
Focuses on the indirect delivery of special education services through collaborative consultation among regular and special educators.

EDSP 638 Educational Management of Physical and Multiple Disabilities (3)
Presents information related to the educational management of students with physical (orthopedic and chronic health) and other (sensory, cognitive, and behavioral) coexisting disabilities.

EDSP 639 Research Analysis in Special Education (3)
Prerequisite: EDFD 600.
Analysis of research in special education relative to methodology and current research efforts in the field. Consideration given to understanding research design and the reading of research studies.

EDSP 640 Introduction to Learning Disorders (3)
Surveys historical, theoretical, research, and philosophical bases of learning disorders related to the academic and social behavior phases.

EDSP 641 Curriculum Methods in Special Education (3)
Prerequisite: Consent of instructor.
Analyzes the subject areas, approaches, techniques, materials, and learning principles used in teaching children in special education.

EDSP 642 Assessment Procedures for Learning and Behavior Disorders (3)
Prerequisite: Must be taken in the last 10 hrs. of program.
Analyzes and evaluates the assessment procedures for children with learning disorders in the academic and social behavior areas.

EDSP 643 Instructional Procedures for Learning and Behavior Disorders (3)
Prerequisite: Must be taken in the last 7 hrs. of program.
Applies assessment, planning, instructional, and evaluation techniques to cases of specific learning disorders.

EDSP 645 Student Teaching: Learning and Behavior Disorders (4)
Prerequisite: Must be taken after all other special education certification courses have been completed.
Provides supervised teaching experiences with children who have specific learning disorders.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDSP 648 Psychological Assessment I (3)
Prerequisite: ECPY 540.
Note: Cross-listed with ECPY 648.
The first of a two-course sequence, ECPY 648-649, that explores theory and applications of individual psychological assessment.
Explores the theory of intelligence, neuropsychological assessment, abilities measures, the ethical, professional, and legal issues of testing in different settings.

EDSP 649 Psychological Assessment II (3)
Prerequisite: ECPY/EDSP 648.
Note: Cross-listed with ECPY 649.
The second of a course sequence that explores theory and applications of individual psychological assessment.
Explores theory and application of tests and social-emotional functioning, development, personality assessment, the ethical, professional, and legal issues of testing in different settings.

EDSP 650 Educational Assessment and Planning for Children and Adolescents with Learning and Behavior Disorders (12)
Prerequisite: Elementary, middle, or high school teacher certification as well as demonstration of proficiency on various special education valued outcomes utilized to effectively serve students with learning and behavior disorders.
Examines specific observation and assessment procedures/strategies used to identify strengths and weaknesses commonly associated with learning and behavior disorders throughout the lifespan. Also provides preparation in the design of academic and behavioral/social programs.

EDSP 651 Instructional Procedures and Collaborative Services for Students with Learning and Behavior Disorders (9)
Prerequisite: EDSP 650.
Examines instructional management procedures relevant to meeting the educational needs of preschool through adult students with learning and behavior disorders in both traditional and nontraditional settings, including collaborative options involving school personnel, parents, representatives of community agencies and related therapies.

EDSP 652 Research Based Programs and Advocacy for Children and Adolescents with Learning and Behavior Disorders (9)
Prerequisite: EDSP 650 and EDSP 651.
Examines collaborative program implementation procedures and research associated with meeting the assessment and program needs of persons of all ages with learning and behavior disorders through readings and extensive field-based experience in schools and related agencies. Includes treatment of advocacy issues and a capstone experience.

EDSP 673 Educational Procedures for Exceptional Children: Diagnostic and Prescriptive Education (3)
Application of educational procedures designed to develop skills in diagnosing and prescribing educational strategies for children with learning and behavior disorders.

EDSP 674 Theories of Behavior Disorders (3)
Psychological, sociological, and physiological theories of behavior disorders. Emphasis on resulting educational problems. Observation and participation in cooperating facilities.

EDSP 675 Management of the Behavior Disorder Child in the Classroom (3)
Study and application of principles appropriate for the education and management of behavior disorder children in the regular classroom.

EDSP 676 Educational Planning for the Behavior Disorder Child (3)
Study and application of principles appropriate for the education and management of behavior disorder children in resource room or special classes.

EDSP 677 Practicum: Education of the Behavior Disorder Child (3-4)
Prerequisite: EDSP 676.
Supervised practicum during which the individual is responsible for the management and instruction of behavior disorder children.

EDSP 681 Early Childhood Education of Exceptional Children (3)
Surveys current education and care of exceptional infants and preschool children; including assessment, methods of treatment, and mainstreaming.

EDSP 682 Workshop on Career Education for the Mildly Handicapped (3)
Methods and materials for infusing Career Education into the curriculum for the mildly handicapped K-12. Emphasizes techniques for fostering motivation to acquire basic academic and social/personal skills as well as meeting the long range goals of career education in the special education program.

EDSP 683 Early Childhood/Special Education Screening (3)
Identification and assessment of children with special needs, ages birth to five.

EDSP 684 Early Family Intervention for Preschool Disabilities (3)
Focuses on relevant issues in the provision of services to preschool children with disabilities through family intervention strategies and methods.

EDSP 686 Programs and Services for Preschool Children With Disabilities (3)
Provides an overview of the types of delivery systems addressed in working with preschool children with disabilities and their families.

EDSP 687 Practicum/Action Research (6)
Preparation of teachers in the development, implementation and evaluation of preschool programs for children with disabilities.

EDSP 690 Human Sexuality of the Developmentally Disabled (3)
Prerequisite: Consent of instructor.
Explores issues, basic concepts, and personal values relating to the human sexuality of mentally retarded and other developmentally disabled children and adults. Limited enrollment.

EDSP 693 Consulting with Parents and Teachers of Exceptional Children (3)
Course designed to provide a background in theories and techniques of consulting and advising and to provide experiential opportunities for observing and participating in consulting and advising sessions.

EDSP 694 Child Abuse and Neglect (3)
Overview of the problems of child abuse and neglect; the educator's role in identifying, reporting, coping with, and ameliorating these problems.

EDSP 695 Teleteaching and Distance Education (3)
Prerequisite: Basic computer proficiency.
Note: Cross-listed with EDTD 695.
Provides hands-on experiences developing and using technology to teach distant learners. Principles and applications of design, development and delivery of instruction using video, audio and computer communications for two-way interactive video.

EDSP 696 Independent Study in Special Education (1-3)
By arrangement with advisor.

EDSP 697 Topical Seminar (1-4)
Intensive study of topics indicated.

EDSP 698 Supervised Readings (1-3)
By arrangement with advisor.

EDSP 699 Thesis or Professional Paper (2-5)
Prerequisite: Consent of advisor.

EDSP 710 Professional Seminar in Special Education (3)
Prerequisite: Admission to doctoral program.
Considers contemporary issues and research in special education. Students are expected to analyze and synthesize information relevant to the field of special education and present it in a series of topical written essays and class presentations.

EDSP 712 Practicum in Special Education Consultation (3-6)
Supervised practicum during which the learner has responsibility for consulting with teachers of exceptional learners regarding special educational problems.

EDSP 720 Historical and Philosophical Bases of Special Education (3)
Prerequisite: Education major and consent of instructor.
The content of this course will include the history and philosophical background of the development of special education. It will include a comparative review of special education in various countries and general direction of current international trends and developments in the field by educators of international prominence.

EDSP 795 Doctoral Research (1-15)
Prerequisite: Passing Ed.D. Comprehensive Examination and admission to candidacy for the Doctoral Degree.
Note: Cross-listed with EDAD, EDFD, ECPY, EDUC 795.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

EDSP 796 Research Literature in Special Education (1-6)
For Ed.S. and Ed.D. candidates only.

EDSP 798 Internship/Field Experience in Special Education (3)
For Ed.D. candidates only.

EDSP 799 Professional Paper (1-6)
For Ed.S. and Ed.D. candidates only.

Sport Administration (0790) SPAD

SPAD 505 Sport Facility Management (3)
Prerequisite: Admission to the School of Education or School of Business or officially accepted as a sport administration minor.
Investigates the design and development of various athletic facilities in diverse settings. Examines corporate, community, and commercial facilities for strengths and weaknesses in design and management procedures.

SPAD 509 History of American Sport (3)
Prerequisite: American History 1 and II (HIST 211 or 212) or consent of instructor.
Sport in American culture and society, with a view toward understanding sport and American society during particular historical periods.

SPAD 521 Independent Study in Sport Administration (1-3)
Prerequisite: Consent of instructor.

SPAD 529 The American Woman in Sport (3)
An effort to understand the role of the American woman in sport. Studies concepts about women, sport, and society in contemporary and historical perspectives.

SPAD 561 Special Topics in Sport Administration (1-3)
Prerequisite: Consent of instructor.
Selected projects of interest to sport administration faculty.

SPAD 604 Financial Principles of Sport (3)
Examines basic financial and managerial accounting concepts necessary to be financially literate in the business of sport. Special emphasis will be placed on understanding annual reports using financial analysis ratios and examining methods for increasing revenue and controlling costs in the sport industry.

SPAD 618 Rise of the Sport System in America (3)
Analysis of the changing form of American sport, emphasizing the influence of urbanization upon the transformation from folk and elite sport to mass sport. The growth of sport as a social institution, the increasing involvement of various social institutions in the promotion and use of sport. Factors in influencing the institutionalization of sport.

SPAD 622 Seminar in Computer Applications in Sport Administration (3)
Prerequisite: BASIC for Business and Social Sciences (ISDP 150) and Introduction to Computer-Based Systems (MGMT 311).

SPAD 624 The Administration of Professional Team Sports (3)
A theoretical analysis of the American team sports industry, with particular emphasis upon management decisions and business objectives.

SPAD 625 Sport Administration (3)
An analysis and overview of nature and scope of various sport and fitness organizations, key managerial concerns, and administrative and management skills fundamental to area.

SPAD 635 Research in Sport Administration (3)
A critical analysis of current research and literature in Sport Administration and the sport business industry for practical application. Students will identify a research question; develop a review of literature; develop a research design; and identify possible implications and applications.

SPAD 661 Special Topics in Sport Administration (1-3)
Prerequisite: Consent of instructor.
Selected projects of interest to sport administration faculty.

SPAD 680 Athletics and Higher Education (3)
Examination of the historical development of athletics within American institutions of higher learning with an emphasis upon concept and ideas that underlie the developments and the major problems affecting contemporary intercollegiate athletics.

SPAD 683 Sport Marketing (3)
Basic principles of promotion, marketing, sponsorship, public relations, television/radio rights, licensing and logos, fund-raising, and more as applied to the sport business industry.

SPAD 684 Current Trends and Issues in Sport Administration (3)
Trends and issues of importance to the practitioner in sport administration.

SPAD 685 Case Studies in Sport Administration (3)
Prerequisite: SPAD 618, SPAD 625, and SPAD 683.
Applications of critical analysis and decision making models to sport industry settings; focus on management and social issues.

SPAD 689 Legal Aspects in the Sport Industry (3)
Prerequisite: SPAD 625 and SPAD 618.
Examines legal issues involving athletes, administrators, athletic trainers, coaches, equipment manufacturers, officials, operators of sport facilities, physicians, and the spectator.

SPAD 692 Internship in Sport Administration (1-3)
Prerequisite: Twenty-one hours completed toward degree, six hours in SPAD and consent of instructor.
Supervised practical work experience in an organization or business related to student's academic field, area of specialization, or career interest.

SPAD 699 Directed Readings in Sport Administration (1-3)
Prerequisite: Fifteen graduate hours and consent of sport administration instructor.
Supervised readings and written project relating to a specific research topic in physical education.

Theatre Arts (0396-TA)

TA 515 Topics in Advanced Speaking English as a Second Language (3)
Prerequisite: Open to students for whom English is a second language, and Speaking English as a Second Language (TA 315).
Training in the speech sound formation, rhythmic stress, intonation, and resonance placement of standard American speech for students who speak English as a second language. Includes practice in effective presentational skills for small group communication. May be repeated up to six hours credit.

TA 520 Acting Workshop (3)
Prerequisite: Advanced Acting II (TA 423) and departmental consent.
Practical problems in the art of acting approached in a laboratory setting. Meets with 530. May be repeated.

TA 521-522 Stage Movement I and II (3-3)
Prerequisite: Consent of instructor.
Development of physical expressiveness and agility for the stage. One section each semester.

TA 523-524 Stage Speech I and II (3-3)
Prerequisite: Consent of instructor.
Development of voice production and articulation for the stage. One section each semester.

TA 525 Advanced Studies in Acting (1-3)
Prerequisite: Consent of instructor.
Group studies in specialized areas of actor training. 2-6 hours of laboratory work, as announced in Schedule of Courses.

TA 529 Actors Theatre of Louisville Workshop (3)
Prerequisite: M.F.A. candidate status.
Focuses on organization of commercial theatre, auditioning techniques, and employment possibilities.

TA 530 Directing Workshop (3)
Prerequisite: Directing Styles (TA 430).
Practical problems in the art of directing approached in a laboratory setting. Meets with 520. May be repeated.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

TA 531 Advanced Directing (3)
Prerequisite: Consent of instructor. The techniques of directing the major play, including artistic, organizational, and budgetary problems.

TA 532 The Director-Designer Relationship (3)
Prerequisite: Consent of instructor. Study of the functions and interactions among members of the theatrical production team.

TA 533 Stage Management (3)
Prerequisite: Consent of instructor. Techniques of production management during audition, rehearsal, and performance. Practical project required. Spring.

TA 540 Problems in Technical Theatre (3)
Prerequisite: Consent of instructor.
a. Stage Properties
b. Sound Engineering
c. Electrical Mechanics
d. Theatrical Physics
e. Special Topics
One section each semester.

TA 541-542 Advanced Scene Design I and II (3-3)
Prerequisite: Consent of instructor. Application of design techniques, emphasizing scenic styles and special design problems. One section each semester.

TA 543 Scenographic Techniques (3)
Prerequisite: Consent of instructor. Graduate students may repeat each section once for credit.
a. Theatrical Drafting
b. Sketching and Rendering
c. Scene Painting
2 hrs. lect., 2 hrs. lab. One section each term.

TA 544-545 Costume Design I and II (3-3)
Prerequisite: Design for the Theatre (TA 241) or faculty consent.
Principles and practices of designing costumes for the stage, including character analysis, color and line, fabrics, and rendering technique. One section each semester.

TA 546 Advanced Stage Makeup (2)
Prerequisite: Consent of instructor. Advanced techniques of design and execution of makeup for the stage. Fall.

TA 547 Period Costume (3)
Prerequisite: Consent of instructor. Historical study of clothing styles from ancient Egyptian period to the twentieth century. Alternate falls.

TA 548-549 Lighting Design I and II (3-3)
Prerequisite: Consent of instructor. Principles and practices of lighting design for the stage, with practical application to student productions. One section each semester.

TA 550 Theatre Practicum (1-3)
Practical work in theatre performance and production. Pass-fail. A maximum of 6 credits in 550 may be counted toward a degree.

TA 555 Special Topics in Theatre (1-3)
Prerequisite: Consent of instructor. Advanced study of specific areas of theatre arts. May be repeated.

TA 560 Directed Study in Theatre History (3)
Prerequisite: Consent of instructor. Survey of theatre history and literature, supplemented with directed reading of secondary sources. Meets with TA 360-361.

TA 567 Asian Theatre (3)
Prerequisite: Consent of instructor. The theatre forms of Japan, China, India, Thailand, and other Asian nations. Alternate springs.

TA 568 Avant-Garde Theatre (3)
Prerequisite: Consent of instructor. Historical study of experimental theatre and drama from Naturalism to the present. Alternate summers.

TA 571 Playscript Interpretation (3)
Prerequisite: Consent of instructor. Advanced techniques of play analysis, emphasizing the theatre artist's response to scripted material. Fall.

TA 581 Drama Techniques for High School Teachers (3)
Provides the student with the opportunity to study theatre not only as an art form but as an instrument of education through the use of drama activities. All activities will be related to their use in relationship with the National Standards for the Arts and the Kentucky Education Reform Act. Emphasis is placed on production skills, scene study, historical periods and improvisation, scene study, historical theatre periods and production skills.

TA 600 Thesis Guidance (1-6)

TA 620 Performance Theory (3)
Prerequisite: Consent of instructor. Historical study of major approaches to the aesthetics of acting and directing. Alternate springs.

TA 622 Graduate Movement I-IV (3)
Prerequisite: Consent of instructor. Specialized movement studies, covering such areas as character movement, stage combat, circus techniques, and mime. One section each semester.

TA 623 Graduate Voice I-IV (3)
Prerequisite: Consent of instructor. Specialized vocal studies, covering such areas as character voice, dialects, expansion of vocal range, and integration of voice and body. One section each semester.

TA 624 Graduate Acting I-IV (3)
Prerequisite: Consent of instructor. Intensive studio training focusing, each semester, on developing specific abilities through exercises and scene work. One section each semester.

TA 625 MFA Performance Project (1-3)
Prerequisite: Consent of instructor. Practical projects in theatre performance (acting, directing, stage management).

TA 640 Design Theory (3)
Prerequisite: Consent of instructor. Historical study of major approaches to the aesthetics of theatrical design. Alternate springs.

TA 641 Color Theory (3)
Study of the physical and psychological properties and effects of color. Alternate springs.

TA 645 MFA Production Project (1-3)
Prerequisite: Consent of instructor. Practical projects in theatre production (design, technical theatre, theatre management).

TA 650 Theatre Internship (1-12)
Prerequisite: Approval of department and host organization. An internship with professional arts organizations.

TA 655 Independent Study (1-3)
Independent study in areas not covered by the regular graduate curriculum.

TA 656 Directed Readings in Theatre (3)
Prerequisite: 24 graduate hours in theatre arts.
Readings in preparation for the M.A. comprehensive examination. Pass/Fail grading.

TA 661 Approaching Period Drama (3)
Prerequisite: Consent of instructor. Methods of preproduction analysis of period plays. Alternate springs.

TA 662 Approaching Realistic Drama (3)
Prerequisite: Consent of instructor. Methods of preproduction analysis of realistic plays. Alternate springs.

TA 663 Approaching Antirealistic Drama (3)
Prerequisite: Consent of instructor. Methods of preproduction analysis of experimental and avant-garde plays. Alternate springs.

TA 670 Dramatic Theory and Criticism (3)
Prerequisite: Consent of instructor. Historical study of major approaches to the aesthetics of theatre and drama. Alternate springs.

Urban and Public Affairs (0595-UPA)

UPA 602 Urban Government and Administration (3)
Examines how government in cities and metropolitan areas resolve, manage and implement decisions. Designed to link theory, practice and analysis of local government.

UPA 603 Studies in Urban Economics (3)
Provides an overview of contemporary theories of urban economic processes, locational competitive advantage, inter-urban economic competition and the new international division of labor.

UPA 605 History of Urban Development (3)
Evolution of the city with special attention to socio-economic development. The role of cities in the Colonial period, on the frontier, and in economic growth; social structure, social mobility, and immigration; the black experience in the city; the development of government, politics, and services; the impact of planning in the 19th and 20th centuries; and the rise of the contemporary metropolis.

UPA 606 Research Methods (3)
Teaches students how to create, use and manage information systems central to policy research in urban and public affairs, and how to reach or recommend policy decisions drawn from these data bases.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

UPA 607 Statistics for Urban and Public Affairs (3)
Students will be required to master analytical techniques including: 1) multivariate crosstabs, 2) analysis of variance and covariance, and manova, 3) correlation and regression, 4) path analysis, 5) multiple classification analysis, and 6) complex causal modeling.

UPA 610 Urban Theory and Public Affairs (3)
How theory and interpretive history illuminate the contemporary nature of the city. Introduces epistemological concerns and the nature of knowledge in describing the city and its urban form.

UPA 620 Analytic Models for the Urban Policy Analysis (3)
Application of multivariate statistical techniques in the formation and assessment of Public Policy. Examines a variety of analytic techniques, particularly those directed toward interactive decision problems.

UPA 621 Program Evaluation and Impact Analysis (3)
The funding of research and its application in public programs; causality and causal modeling. Methodological tools used to assess public enterprise. Other topics include classical and quasi-experimental design, measurement, scale analysis, index construction, and program monitoring.

UPA 622 Urban and Community Needs Assessment (3)
History, concepts, findings and value orientations of community psychology and epidemiology. Need assessment, techniques of data collection and utilization for social policy and program planning.

UPA 625 Macroeconomic Theory (3)
Prerequisite: ECON 500 and elementary calculus.
Note: Cross-listed with ECON 650.
Aggregate income and employment theory. Classical and Keynesian models; monetary and fiscal policy; the theory of growth and cycles.

UPA 626 Econometrics (3)
Economic theory and statistics combined to formulate quantitative models for measurement of relationships among economic, financial, and demographic data. Extension of basic statistics focusing on simple and multiple regression using matrix algebra. Simultaneous equations and techniques also discussed. In-depth analysis of results from applied projects will include evaluation of autocorrelation, heteroscedasticity, and multicollinearity.

UPA 627 Decision Models (3)
Cost-benefit analysis and the design and use of probability models for dealing with complex decision-making in situations involving uncertainty.

UPA 629 Urban Geography and Information Systems (3)
Examines the city as a spatial and environmental entity and couples this analysis to the use of geographic information systems. This includes geographic base managing advanced computer techniques and file manipulation.

UPA 630 Politics of Policy Formation (3)
Local, state, and federal decision-making processes as they affect public policy in urban areas. Emphasis on the impact of urban political systems, centralization and decentralization in the metropolis intergovernmental relations and power structure.

UPA 632 Independent Study (1-6)

UPA 640 Urban and Community Economic Development (3)
The use and application of static and dynamic models for urban and community development. Includes economic base, industry and firm location models, and community growth. Topics include transportation, energy, pollution, income distribution, and employment.

UPA 643 Inequality and Public Policy (3)
Analysis of the conditions and causes of poverty in the U.S. Examination of government attempts to alleviate poverty including past and current policy issues and programs such as job training, income maintenance, educational enhancement, and community organization. The economic, social, and political issues involved in designing and implementing these programs.

UPA 646 Urban and Public Finance (3)
Taxing and spending activities carried out by cities and other localities. Concepts of allocation of public goods, public choice, "externalities," income distribution, transfer payments, benefit-cost analysis, and taxation are applied to a variety of urban services such as mass transit, police and fire protection, zoning and planning and environmental policies.

UPA 647 Urban Finance and Budgeting (3)
Prerequisite: ACCT 500.
Application of financial principles to public budgeting. Time value of money, cash flow analysis, issuing debt, financial institutions and agencies, capital budgeting, and analysis of state and local debt.

UPA 648 Housing (3)
Examination of housing policies, methods of ownership, and public-private partnerships. Consideration of federal housing programs, as well as private market development.

UPA 651 The Politics of Urban Development (3)
The role of political processes in the formulation and implementation of urban development policy; federal regulations and development; community competition and conflict.

UPA 660 Advanced Organizational Behavior (3)
Concepts and theories from the behavioral sciences that explain human behavior within organizations. Individual behavior and group dynamics with special emphasis on techniques and methods to improve individual functioning and interpersonal processes.

UPA 661 Public Administration (3)
Note: Cross-listed with POLS 625.
Basic principles of public administration, with analysis of problems of bureaucracy, organization, financial management, and public control.

UPA 662 Administrative Law and Processes (3)
Note: Cross-listed with PADM 610/POLS 615.
Study of processes of law-making and application by governmental executive departments. Encompasses substantive issues facing agencies in designing and implementing effective regulation and court efforts to interpret and control agencies' activities.

UPA 663 Organizational Theory, Structure and Design (3)
Examination of concepts concerning the structures and processes utilized by organizations in managing internal systems and environmental interactions. Topics include information systems, organizational design, and strategic planning as they impact organizational effectiveness.

UPA 667 Human Resource Management In Public And Nonprofit Organizations (3)
Note: Cross-listed with PADM 642.
Basic theories, public policies, laws, regulations, problems, and prospects of human resource development and management within the context of the public sector.

UPA 668 Labor-Management Relations in Public and Nonprofit Organizations (3)
A study of labor-management issues with emphasis on 1) the organizing stage, 2) problems in the shop, 3) problems at the bargaining table, 4) labor relations and public policy, and 5) an examination of labor relations overseas. These issues are examined through the intensive analysis of factual descriptions. Students are provided with the opportunity to participate in role playing, prepare arguments, and make decisions.

UPA 672 Strategic Planning & Management (3)
Note: Cross-listed with PADM 605.
Administration of the organization from the point of view of top level management. Formulation and administration of policies and practices. Development of long-range strategic plans as well as the diagnosis, analysis, and evaluation of specific organizational problems.

UPA 680 Special Topics in Urban and Public Affairs (1-6)
An advanced study of one or more selected topics or issues related to the study of Urban and Public Affairs.

UPA 682 Principles of Urban Design (3)
Note: Cross-listed with PADM 622.
Examines principles and techniques of designing large-scale spatial environments, and the relationship of urban images and physical form to human and natural environments. Introduces physical design processes.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

UPA 683 Land Use and Environmental Planning (3)
Techniques of land use planning including surveys, analyses of population, activity systems, and land use are evaluated. Examines various concepts of land development within the context of environmental concerns, environmental analysis, and overall planning.

UPA 684 Urban Planning Theory and Process (3)
Practice and theory of planning with special emphasis on the political and technical factors influencing the role of planning.

UPA 685 Urban Architecture (3)
Architectural theory and the ways in which historical works and past and present theoretical constructs may contribute to the process of building design and urban design.

UPA 686 Critical History of Urban Architecture (3)
Social and political history of design in cities; its ideology, instrumentality and interests. Uses historical, literary, artistic and architectural sources to reconstruct the discourses that lay within the production of architectural forms and urban design plans.

UPA 688 Transportation Planning and Urban Development (3)
Note: Cross-listed with CE 660.
Principles of transportation planning in the urban environment, including land use planning, with emphasis on the orderly development of the transportation system.

UPA 689 Traffic Engineering and Operations (3)
Focuses on the analysis of the characteristics of drivers and vehicles, traffic studies, capacity, signal systems, engineering solution of traffic movement problems.

UPA 690 Public Transportation (3)
Analysis of characteristics and costs of existing and innovative mass transit systems. Role of planning methods in estimating transit usage and choosing optimal plans.

UPA 691 Ground-water and Seepage (3)
Occurrence, distribution, and movement of water below the surface of the earth; ground-water resources, and dependable supply rates from wells, artificial recharge, and waste disposal.

UPA 692 Stochastic Processes in Hydrology (3)
Note: Cross-listed with CE 671.
Basic concepts and classification of stochastic processes with emphasis on hydrologic systems; analysis hydrologic time series; models for stationary hydrologic stochastic processes.

UPA 693 Industrial Waste Treatment (3)
Analysis of the methods and techniques of industrial waste disposal with special emphasis on cities and the quality of urban life.

UPA 695 Hazardous Waste Management (3)
Analysis of the technology and managerial strategies to deal with hazardous waste disposal.

UPA 696 Case Studies of Urban Infrastructure (3)
Examination of the technical, social, financial, and political aspects of urban infrastructure; case histories of various cities are examined and analyzed.

UPA 699 Ph.D. Research Seminar (3)
Prerequisite: Completion of core courses and permission of program advisor.
Focuses upon a major research project in urban and public affairs. A capstone for the core curriculum; applies knowledge and techniques from the field toward a research project.

UPA 700 Dissertation Research (1-12)
Prerequisite: Permission of program advisor.

Urban Affairs (0398-URBA)

URBA 527-528 Urban Studies Seminar (3-3)
Prerequisite for 527: Consent of instructor
Prerequisite for 528: URBA 527 or consent of instructor.
A senior-level, team-taught seminar which attempts to integrate various aspects of urban studies. Student projects in 527 will explore problems, solutions, and opportunities within the urban scene, utilizing information gained from earlier courses. Each student in 528 will complete a major research project which will deal with a central theme of the year's seminar. Topic for the year listed in course.

URBA 529 Urban Studies Practicum (4)
Prerequisite: Acceptance of application prior to enrollment; consent of agency.
Individual training and field placement in an urban-studies-related public agency or institution. A weekly seminar to compare experiences. 2 hrs. lect., 8 hrs. field experience per week.

URBA 530 Urban Studies Field Experience Seminar (3)
Prerequisite: URBA 529.
Seminar concerning urban problems from the perspective of an urban-related public agency or institution. Student expected to continue practicum for at least 4 hours per week. A completed project will be required. 2 hrs. lect., 4 hrs. field experience per week.

Visual Sciences (5298-VISC)

VISC 601 Principles of Visual Sciences I (3)
A survey of ocular function and specialization including ocular anatomy, physiology, biochemistry and pharmacology with sections covering cornea, aqueous, lens and vitreous.

VISC 602 Principles of Visual Sciences II (3)
A survey of ocular function and specialization including neuroscience anatomy, physiology, biochemistry and pharmacology with sections covering retina, photoreceptors, and visual processing.

VISC 610 Research (1-12)
Prerequisite: Consent of instructor.
Research in ophthalmology and visual sciences.

VISC 611 Topics in Ophthalmology or Visual Science (1-3)
Prerequisite: Consent of instructor at least two weeks before beginning of course.
Detailed discussion of selected current topics in ophthalmology and visual sciences.

VISC 612 Seminar (1)
Oral presentation of topics in ophthalmology and visual sciences.

VISC 614 Dissertation Research (1-6)
Research related to doctoral dissertation.

VISC 615 Current Topics in Glaucoma Research (3)
Prerequisite: Graduate of medical biochemistry, physiology and pharmacology, or consent of instructor.
Oral presentations relating to glaucoma research.

VISC 616 Mechanisms of Ocular Inflammation (2)
Prerequisite: Consent of instructor.
Factors and mechanisms involved in initiation, sustenance and resolution of inflammation in the eye.

VISC 617 Current Topics in Retinal Cell Biology (3)
Prerequisite: Advanced Cell Biology
Discussion of current research in retinal cell biology.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

VISC 618 Physiology of Avascular Tissues (3)
Prerequisite: Consent of course director.
Physiology of cornea, aqueous humor, lens and vitreous, including pathophysiology and disease.

VISC 619 Pharmacology of Receptors and Transduction Mechanisms (2)
Prerequisite: Consent of course director.
Methods of studying receptors, physiology of paracrine and autocrine hormone receptors and their transduction processes.

VISC 620 Glaucoma (3)
Prerequisite: Basic knowledge and understanding of the eye in health. Basic understanding of glaucoma and the accompanying pathophysiology.
Current concepts in glaucoma ranging from pathophysiology to treatment.

VISC 621 Eicosanoid and Related Compounds: Biological Functions (3)
Prerequisite: Consent of instructor.
Eicosanoid receptors and role of these compounds and receptors in physiology and pathophysiology.

VISC 667 Advanced Cell Biology (3)
Prerequisite: One quarter of graduate level biochemistry or consent of instructor
Note: Cross-listed with ANSB 667, BIOC 667, BIOL 667, MBIO 667.
An advanced treatment of cell structure and function including: membranes, organelles, cytoskeleton, cellular communication, and control of cell growth.

Women's Studies (0399-WMST)

WMST 500 Senior Seminar in Women's Studies (3)
Prerequisite: Consent of instructor.
Investigates a Women's Studies topic from an interdisciplinary perspective and requires students to practice interdisciplinary methodology.

WMST 530 Feminism in Western Civilization, 1790-1920 (3)
Prerequisite: Consent of instructor.
Comparative analysis of feminist movements in the United States, Britain, and Europe, stressing intellectual background, social composition, goals and political strategies. Credit may not be received for this course and HIST 588.

WMST 531 Women in the Twentieth Century in Europe and the U.S. (3)
Prerequisite: Consent of instructor.
Note: Cross-listed with HIST 583.
The history of women in Western society, including Europe and the U.S. in the twentieth century. Includes political, economic, social, and cultural developments.

WMST 532 History of American Sexualities (3)
Prerequisite: Consent of instructor.
Note: Offered in conjunction with HIST 589.
Focuses on sexual behaviors and meanings in America from the Colonial period to the late twentieth century, and how sexual meanings impact on people's identities, choices, and social positions. Also concerns the interaction of gender, race, and class.

WMST 535 Women's Health Issues (3)
Note: Cross-listed with HPES 564
A study of the sociological, psychological and physiological factors that influence women's health.

WMST 556 Feminist Theory (3)
Note: Cross-listed with POLS 568.
Survey of the history and scope of the feminist tradition with emphasis upon liberal, radical, Marxist, socialist, psychoanalytic, and postmodern approaches to feminist theory.

WMST 558 Women and Leadership in Developing Countries (3)
Note: Cross-listed with POLS 563.
Follows the progress of the international women's movement by focusing on the emergence of women leaders and their work in developing countries since the First World Conference on Women 1975 to the present.

WMST 571 Francophone Women Writers and Critics (3)
Note: Cross-listed with ML 506.
Readings in creative and critical work by Francophone women from the Middle Ages to the present. Readings and discussion in English.

WMST 590 Independent Study (3)
Prerequisite: Consent of instructor.
Note: Restricted to Women's Studies minors or majors.
Provides opportunity for a student supervised by a Women's Studies professor to do advanced interdisciplinary work on a Women's Studies topic.

WMST 591 Topics in Women's Studies (3)
Prerequisite: Consent of instructor.
Provides advanced study of a special topic related to women or gender from an interdisciplinary perspective.

WMST 592 Advanced Studies in Women's Studies (3)
Prerequisite: Consent of instructor.
Provides advanced study of a special topic related to women or gender from an interdisciplinary perspective.

Prerequisites
Prerequistes for all courses include graduate status and the consent of the graduate advisor (registration). Specific course prerequisites are indicated in the course listing.

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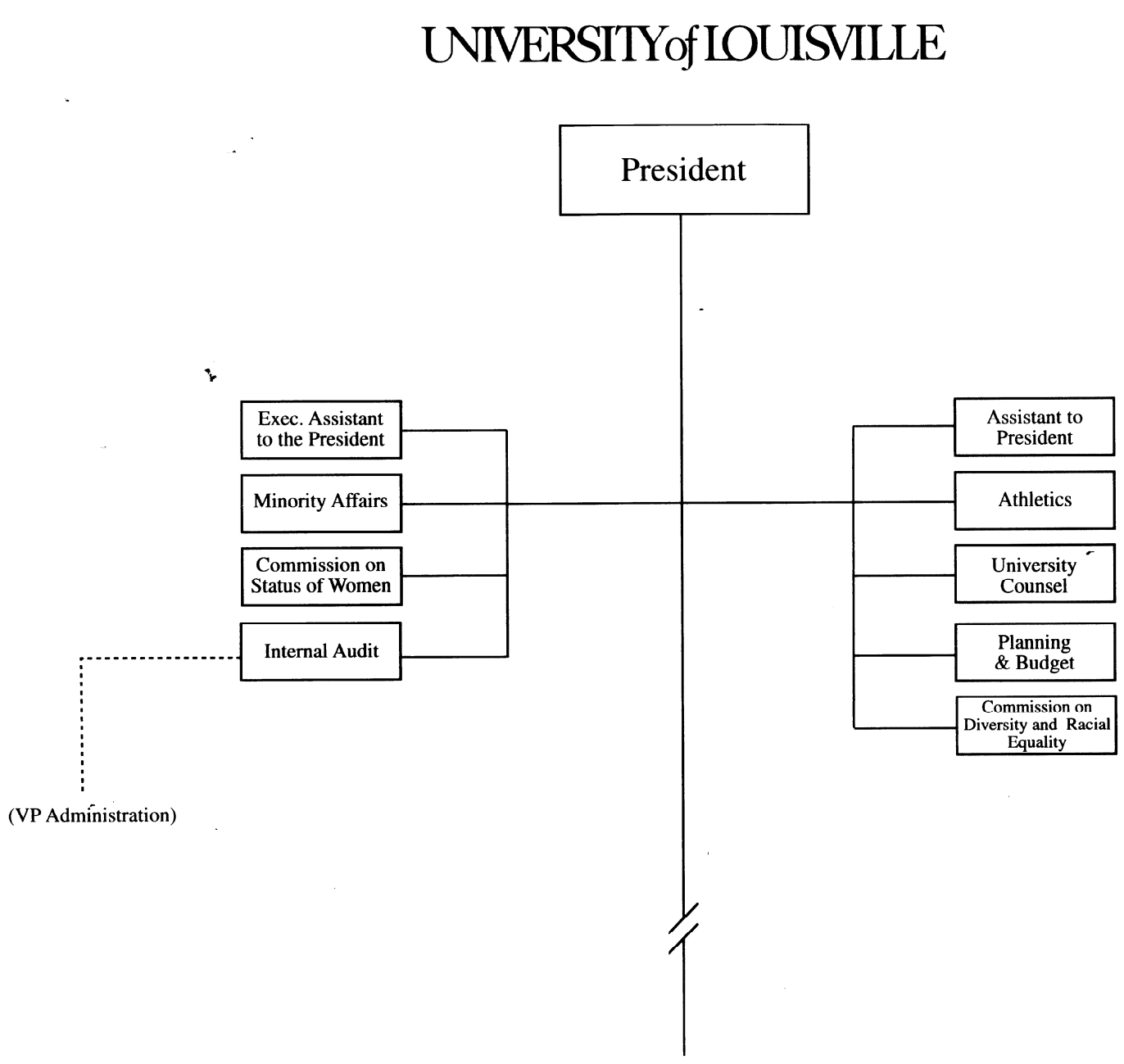
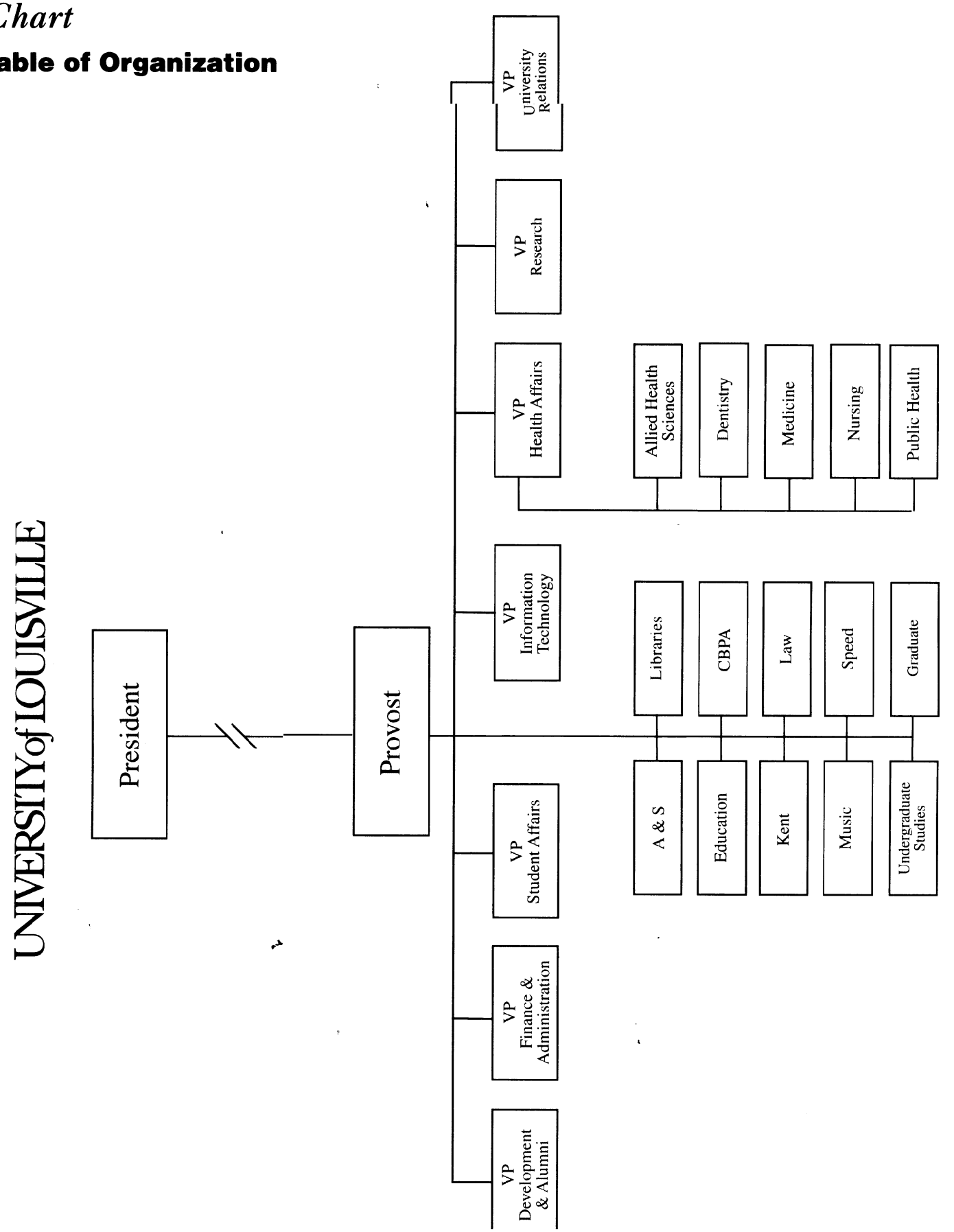
Organizational Chart

Table of Organization



Organizational Chart

Table of Organization



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