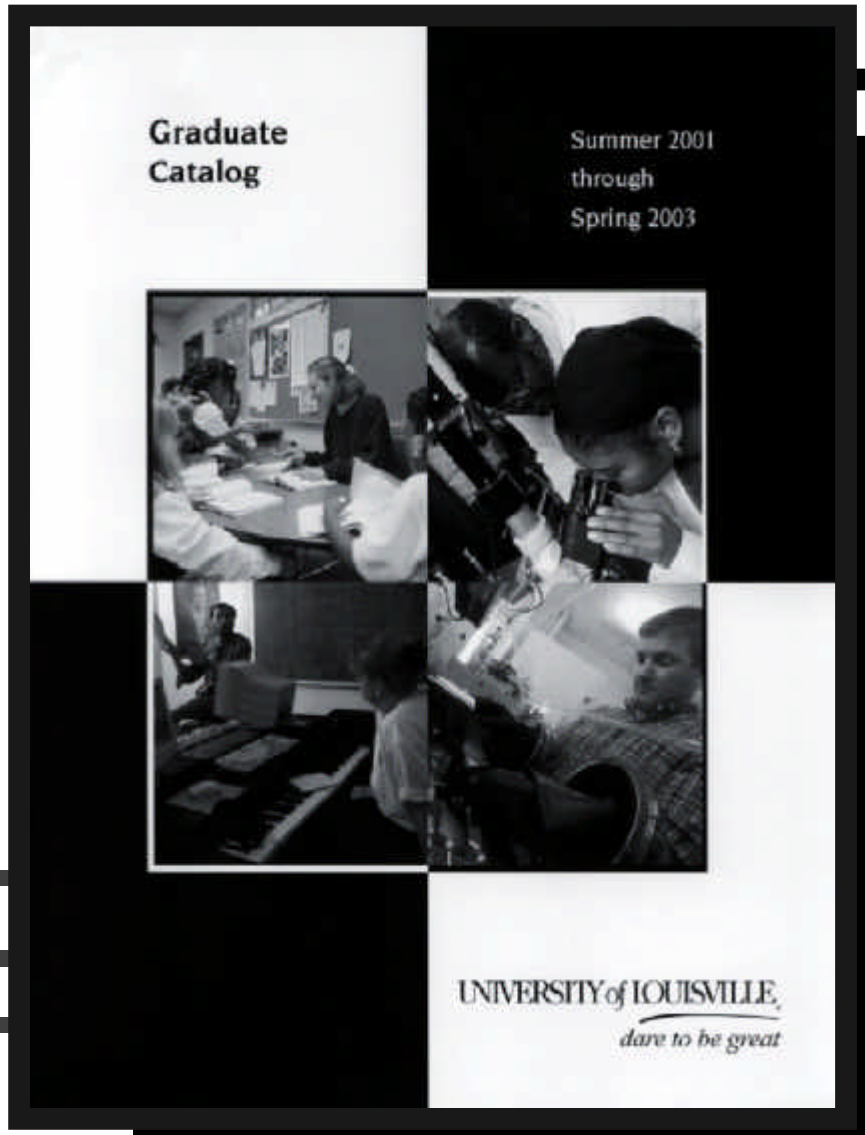

University of Louisville

2001-2003 Graduate Catalog

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UNIVERSITY of LOUISVILLE®

dare to be great

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

Summer 2001—Spring 2003 Graduate Catalog

Revised April 2001

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 2001–2002

Fall 2001 Semester

Classes start	August 20	Monday
Last day of registration	August 20	Monday
Weekend classes start	August 24, 25, or 26	
Labor Day holiday	September 3	Monday
Last day to apply for degree	September 7	Friday
Mid-term break	October 8–9	Monday-Tuesday
Last day to withdraw	October 11	Thursday
Thanksgiving vacation	November 21–25	
End of weekend classes	November 30 or December 1, 2	
End of classes	December 3	Monday
Final examinations	December 5–11	Wednesday-Tuesday
Degree date	December 11	Tuesday
Fall Commencement	December 16	Sunday

Spring 2002 Semester

Classes start	January 7	Monday
Last day of registration	January 7	Monday
Weekend classes start	January 11, 12, or 13	
Martin Luther King Jr. Day holiday	January 21	Monday
Last day to apply for degree	January 25	Friday
Last day to withdraw	February 25	Monday
Spring vacation	March 11–17	
Final Exams:		
for Weekend classes	April 26, 27, or 28	
for other classes	April 24–30	
End of classes	April 22	Monday
Reading day	April 23	Tuesday
Spring Commencement	May 11	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

Computer Science Accreditation Commission (CSAC) of the Computing Sciences Accreditation Board (CSAB)

Council on Collegiate Nursing Education

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

Engineering Accreditation Board Commission of the Accreditation Board for Engineering and Technology

Foundation for Interior Design Education Research

Institute of International Education

International Association of Management Education (IAMB)

Interuniversity Communications Council (EDUCOM)

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 Schools of Public Affairs and Administration

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

Sport Management Program Review Council of the National Association for Sport and Physical Education and the North American Society for Sport Management

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

General Information

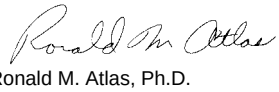
General Information

Welcome

Experience the excitement of discovery. Create new knowledge in your field of study. Learn the practical applications of theory from world-class faculty. At the University of Louisville, we believe a graduate program should change your work...and your life.

U of L is a metropolitan research university with an attractive main campus in Kentucky's largest city and a Health Sciences Center in the downtown medical complex. Enrollment is more than 20,000, with more than 4,000 students pursuing graduate degrees.

Louisville is an exciting, vibrant city, centrally located within the United States. With lots of charm and much to see and do, from the cultural arts to sports, it is home to almost one million people from across the U.S. and around the world.



Ronald M. Atlas, Ph.D.
Dean of the Graduate School

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, College of Business and Public Administration, College of Education and Human Development, Graduate School, Kent School of Social Work. School of Dentistry, School of Law, School of Medicine, School of Music, School of Nursing, and Speed Scientific School.

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 Kentucky Postsecondary Educational Improvement Act of 1997 establishes as a goal for the University of Louisville to become a premier, nationally-recognized metropolitan research university. Achieving this goal will likely require revision of the currently approved mission statement for the University as the Improvement Act is implemented. The current mission statement appears below and was approved by Council on Postsecondary Education, July 1, 1994.

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
Joseph S. Beyel, M.S.

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

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

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

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

Deans

Laura Schweitzer, Ph.D.
School of Allied Health Sciences, Acting Dean

James F. Brennan, Ph.D.
College of Arts and Sciences

Robert L. Taylor, D.B.A.
College of Business and Public Administration

John N. Williams, Jr., D.M.D.
School of Dentistry

Douglas J. Simpson, Ph.D.
College of Education and Human Development

Ronald M. Atlas, Ph.D
Graduate School

Terry L. Singer, Ph.D.
Kent School of Social Work

Laura Rothstein, J.D.
School of Law

Joel A. Kaplan, M.D.
School of Medicine

Herbert L. Koerselman, D.M.A.
School of Music

Mary H. Mundt, Ph.D.
School of Nursing

Thomas R. Hanley, Ph.D.
Speed Scientific School

Hannelore Rader, M.L.S.
University Librarian

Degree Programs

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

Doctor of Audiology (Au.D.)

Doctor of Education (Ed.D)

1. Counseling & Personnel Services
2. Educational Administration
3. Education Supervision (includes a concentration in 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 the degree is awarded by the University of Louisville in cooperation with Western Kentucky University.

Doctor of Philosophy (Ph.D.)

with programs in:

1. Anatomical Sciences & Neurobiology
2. Applied and Industrial Mathematics (pending approval)
3. Art History
4. Biochemistry and Molecular Biology
5. Biostatistics: Decision Science
6. Chemical Engineering
7. Chemistry
8. Civil Engineering
9. Clinical Psychology
10. Computer Science and Engineering
11. Electrical Engineering
12. English Rhetoric and Composition
13. Environmental Biology
14. Epidemiology - Clinical Investigation Sciences
15. Experimental Psychology
16. Industrial Engineering
17. Mechanical Engineering
18. Microbiology and Immunology
19. Musicology (cooperative degree awarded by the University of Kentucky)
20. Pharmacology and Toxicology
21. Physics (cooperative degree awarded by the University of Kentucky)
22. Physiology and Biophysics
23. Social Work (joint degree awarded by the University of Louisville and University of Kentucky)
24. Urban and Public Affairs

Joint Degrees

Combined Juris Doctor and Master of Arts in Humanities (JD/MA)

Combined Master of Business Administration and Juris Doctor (MBA/JD)

Combined Master of Business Administration and Mechanical Engineering (MBA/MENG)

Combined Master of Science and Doctor of Dental Medicine (MS/DMD)

Combined Master of Science and Doctor of Medicine (MS/MD)

Combined Master of Science in Social Work and Juris Doctor (MSSW/JD)

Combined Doctor of Medicine and Master of Business Administration (MD/MBA)

Combined Doctor of Philosophy and Doctor of Medicine (MD/PhD)

Master of Accountancy (M.Ac.)

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

1. Art Therapy (Expressive Therapies)
2. English
3. Fine Arts with concentrations in: Art History, Critical and Curatorial Studies, and Studio Art (pending approval)
4. Foreign Language Education
5. French (Language and Literature)
6. Higher Education (includes a concentration in Sport Administration)
7. History
8. Humanities includes concentrations in Civic Leadership, Linguistics and Philosophy
9. Mathematics
10. Political Science
11. Psychology
12. Sociology includes concentration in Pan-African Studies; minors in Communication and Urban Geography
13. Spanish

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

1. Art Education
2. Early Elementary Education
3. Middle School Education
4. Music Education
5. Physical Education
6. Secondary Education

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

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

1. Counseling & Personnel Services with concentrations in:
   a. Community Counseling
   b. Counseling Psychology
   c. Elementary School Counseling
   d. Secondary School Counseling
   e. Student Personnel Services
2. Early Childhood Education
3. Early Elementary Education
4. Educatonal Administration
5. Human Resource Education
6. Instructional Technology
7. Middle School Education
8. Physical Education
9. Reading Education with endorsement in Reading and Writing
10. Secondary Education with concentrations in MAT in Biology, Busness Education, English, French, German, Mathematics, Physical Science, Russian, Social Studies and Spanish.
11. Special Education or Special Education with concentrations in:
    a. Learning & Behavior Disorders
    b. Learning Disabilities
    c. Mental Retaradation
    d. Moderate and Severe Disabilities
    e. Severe Behavior Disabilities
    f. Visual Impairment

Master of Engineering with specialization in:

Chemical Engineering
Civil Engineering
Computer Engineering and Computer Science
Electrical Engineering
Industrial Engineering

Master of Fine Arts (M.F.A.) with a major in Theatre Arts (includes a concentration in African-American Theatre)

Master of Music (M.M.):

1. Performance: concentrations in:
   Instrumental Conducting
   Choral Conducting
   Jazz
   Piano Pedagogy
2. Music History and Literature OR Theory and Composition

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

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

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

1. Anatomical Sciences and Neurobiology
2. Biochemistry
3. Biology
4. Chemical Engineering
5. Chemistry
6. Civil Engineering
7. Communicative Disorders
8. Computer Science
9. Electrical Engineering
10. Exercise Physiology
11. Industrial Engineering
12. Justice Administration
13. Mechanical Engineering
14. Microbiology and Immunology
15. Oral Biology
16. Pharmacology and Toxicology
17. Physics
18. Physiology and Biophysics
19. Sport Administration (pending approval)

Master of Science in Public Health (MSPH)

Biostatistics- Decision Science
Epidemiology -Clinical Investigation Sciences

Master of Science in Nursing (MS)

Master of Science in Social Work (MSSW)

Family Therapy (MSSW-MFT)

Master of Urban Planning (MUP)

Specialist in Education (Ed.S.)
Educational Administration with concentrations in:

a. Principalship
b. Superintendent
c. Supervision

Graduate Certificates

1. Clinical Investigative Sciences
2. Environmental Engineering
3. Pan-African Studies
4. Women's Studies

Interdisciplinary Degrees
It is possible to establish interdisciplinary programs for individual students in the areas not represented by the traditional disciplines at the PhD, EdD, and Masters level.

For the New Graduate Student

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 are sent through postal or e-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.

Students who take these courses as post-baccalaureate 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 a year-round schedule (Summer, Fall and Spring). Students must first contact their department advisor to discuss course selections.

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 day of classes. One may also drop or withdraw from courses by touch-tone (see Schedule of Courses for appropriate dates).

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 bulletin.

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.

Application for admission

Application forms may be obtained from the Graduate School or the Office of Admissions or on-line at www.graduate.louisville.edu. The application must be accompanied by a $25.00 non-refundable application fee. Applications are not processed until the application fee is received.

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.

Examination scores

Except as noted below each applicant is required to take the General Test Section of the Graduate Record Examination (GRE) www.gre.org 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 bulletin.

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. Kent School students in the MSSW program are not required to take the GRE.

Students may substitute the Medical College Admissions Test for the Graduate Record Examination with the approval of the department chair or graduate program advisor.

Information about the times and places for taking these examinations may be obtained from the University Testing Service, University of Louisville at www.louisville.edu/students/services/testing, or from the Educational Testing Service, Princeton, New Jersey, 08540 and the Sylvan Learning Center by appointment located at 7400 LaGrange Road, Louisville, KY (502) 423-0478.

International Students

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 210 or higher on the computer-based 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.

TOEFL Examination

This examination is required of all foreign 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 (www.TOEFL.org). Graduate programs may require higher TOEFL scores than the Graduate School minimum.

Applicants who have not scored 210 or more on the computer-based 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. www.louisville.edu/a-s/iesl/.

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 Educational Testing Service, TSE, Princeton, N.J. 08540. The teaching competency demonstration is administered by the Intensive English as a Second Language Program.

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. 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 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 (3.0 GPA) 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 be permitted to enroll under non-degree status. Application credentials must include the application form and an undergraduate transcript showing the award of a 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 College of Education and Human Development, the Nurse Practitioner program in the School of Nursing and the post-master's certificate 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 adviser 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 graduate.

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 at the University of Louisville.

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.

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.

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). This GPA is not reflected on grade reports or transcripts.

Overall Graduate GPA
The overall graduate GPA is the grade point average for all graduate-level courses taken while a graduate student.

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, peculiar to that degree, which are detailed in the following descriptions. Also, individual departments may have requirements peculiar 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 are sent through postal or e-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. Six hours may be applied toward two Masters degrees.

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 College of Education and Human Development, 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 6 hours during the summer term or in candidacy status. For the purposes of billing, financial aid awards, and/or loan deferments, students must enroll in 9 or more credit hours in the Fall, Spring and Summer semesters. 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 and Graduate Assistants must be enrolled as full time students during the period that they are receiving financial support.

Degree 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 for the degree 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 equivalent to tuition fee for one semester credit hour for all students. In addition, all relevant student fees are charged to students who register in candidacy.

Once a student registers for candidacy he/she may register for additional courses, at the students expense.

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 the Graduate Dean. For each of the semesters during which his/her candidacy was void, the student will be required to pay the Candidacy Fee 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. 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 specialist's degrees.

Application for Degree

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 degree 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 adviser. 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 or professional 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.

Graduate 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-	1.7
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 adviser 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

Alice Eaves Barns Award

Named in honor of Mrs. Alice Eaves Barns for her many years of outstanding service as a staff member of the Graduate School at the University of Louisville. Mrs. Barns' extraordinary dedication, unwavering eagerness to serve as advocate for the needs of all graduate students and willingness to overcome all obstacles necessary to achieve desired goals, embodies the Spirit of the Graduate School. Given in recognition of outstanding achievement in a Master's Program. Nominations may be sumbitted to the Graduate Dean for the May and December convocations.

Graduate Dean's Citation

Graduate Dean's Citations are awarded at each commencement 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 Stevenson Award

The Guy Stevenson 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 doctoral dissertations are submitted for 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 Stevenson and Binford awards are submitted to the Graduate 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

Requirements for the Master's Degree

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 Dean of the Graduate School.

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 (guidelines may be found at www. graduate.louisville.edu).

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 procedures 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 school (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, College of Education and Human Development, School of Music, or College of Business and Public Administration and designated pre-teacher education courses in the College of Education and Human Development. Students then apply to the Master of Arts in Teaching (MAT) degree program which is completed at the graduate level.

Successful completion of the graduate program 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 College of Education and Human Development Advising Center.

Certification programs for school principalship (grades P-12), school superintendent, and supervision are offered through programs in 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.D. program requirements if the candidate is admitted to such a program.

Requirements for Master's Programs in Education

The College of Education and Human Development offers, through the Graduate School, the degrees of Master of Education, Master of Arts in Higher Education, Master of Science in Exercise Physiology, Master of Science in Sport Administration (pending approval) and Master of Arts in Teaching.

Students desiring to acquire a teacher's certificate through the M.A.T. program should consult the College of Education and Human Development Advising Center 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 College of Education and Human Development are described in this 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 College of Education and Human Development. 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 College of Education and Human Development 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

Masters' programs in education prepare the student for leadership and specialized roles in both school and non-school settings. Many 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, sport administration 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 College of Education and Human Development.

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. The GRE must be taken prior to admission to the Master of Arts in Teaching degree program. A combined score of 800 or above on the Verbal and Quantitative sections of the GRE is expected for all programs in the College of Education and Human Development 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 College of Education and Human Development'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 College of Education and Human Development 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 College of Education and Human Development 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 College of Education and Human Development 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 Advising Center, or the appropriate department chair within the College of Education and Human Development. After admission, the student will be assigned a permanent faculty adviser 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 minimum grade point average of a 2.50 is required for admission to a Rank II Equivalency Program. A grade point average of 2.5 or above 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 Advising Center, or from appropriate faculty advisors in the College of Education and Human Development.

The Master of Arts in Teaching Program

Based on a conceptual framework, "teaching for knowledge, leadership and change: enabling success for all learners" 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 cousres 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 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 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), physical education (grades P-12), and foreign language 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 course(s) in understanding children and families, their sociocultural background, and the structure and function of schools.

Applicants have to option of attending on a full or part- time basis. 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, 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 in Education Administration. 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

For many educators, the decision to pursue a doctorate is a professional turning point.

Some want to earn an Ed.D. in order to assume new levels of responsibility in their organizations. Others seek a doctorate as part of a long term plan to change the course of their lives and careers.

The common thread for most candidates-weather they work in education administration or a coporate training center, a university, a human services agency, or a classroom-is the desire to increase knowledge in their field and develop leadership ability in a critical enterprise of learning and human development.

With the adoption of the Kentucky Education Reform Act in 1990, Kentucky moved to the forefront of national school reform. The Univesity of Louisville College of Education and Human Development has been at the leading edge of that movement. Throughout the nation, doctoral recipients from our programs are:

- Leading change in educational policies and practices
- Participating in groundbreaking research on learning, particularly in urban settings
- Finding creative solutions to the challenges in dynamic business environments
- Making a difference

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.

The curriculum in counseling psychology has four broad areas of study:

1) science of psychology;
2) research and statistics;
3) counseling psychology;
4) electives in counseling and psychotherapy

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 College of Education and Human Development 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. Each exam may be repeated only once. 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 College of Education and Human Development 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 five 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 College of Education and Human Development. However, all members must be approved by the Dean of the Graduate School (forms may be found at www.graduate.louisville.edu).

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 College of Education and Human Development. 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 on-line 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 College of Education and Human Development) 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 College of Education and Human Development 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, College of Education and Human Development, University of Louisville, Louisville, Kentucky 40292; (502) 852-5597 www.louisville.edu/edu.

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 (guidelines may be found at www.graduate.louisville.edu).

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 (forms may be found at www.graduate.louisville.edu).

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 (14) 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 Services

University Libraries

The University offers an extensive library system designed to support graduate research in a variety of fields. The University Libraries consist of the Ekstrom Library, the Bridwell Art Library, and four libraries serving the students and faculty in the areas of Music, Law, Health Sciences, Engineering, Physical Sciences and Technology, and the University Archives and Records Center. Total University of Louisville Library holdings number approximately 1,700,846 volumes.

The libraries subscribe to 14,749 journals and to over 250 electronic journal citation databases, with electronic access to more than 15,000 journals. In addition, the libraries hold over 1.7 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 Kentucky Commonwealth Virtual Library (KYVL), 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 accessed through the Minerva 2000 online catalog. http://minerva.louisville.edu/

Ekstrom Library

The William F. Ekstrom Library on Belknap Campus contains over 958,000 books and subscribes to 4,641 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-workstation . 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.

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 1, and the history of theater and film. A regular exhibition schedule draws special attention to these and other collections.

The University Writing Center is located on the third floor of the Ekstrom Library. Consultants are available in the Center to work with students who want help with writing assignments and writing projects.

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

University Archives and Records Center

The University Archives, located in the Ekstrom Library, 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/ .

Margaret M. Bridwell Art Library

The Margaret M. Bridwell Art Library, located on the main floor of Schneider Hall, contains the University's research collection in art, design and architectural history. The Art Library has more than 71,000 volumes, subscribes to 300 journals and museum bulletins, collects videos and CD-ROMs, and provides access to the major electronic and print indexes. The library collections support the programs of the Fine Arts Department, covering the areas of painting, drawing, sculpture, printmaking, photography, architectural history, interior design, graphic design, art education, pottery, fiber arts and decorative arts. The Art Library also has a rare book room for rare and scarce materials.

Art Library services include a group study room for watching videos or viewing slides, a scanner for making color copies, and a public-use computer for word processing.

Art Library books circulate only to faculty and to graduate students in the Fine Arts Department and the Expressive Therapies program.

More information about the Art Library can be found at 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 92,000 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 and DVD players. The sound recording collection now exceeds 15,000 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 130,565 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 1,317 periodicals and holds theses which have resulted 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), Beilstein's Current Facts in Chemistry and Web of Science. Many jounals and course reserve items are available electronically.On-line searching and reference assistance are available by appointment. A 24-hour workstation computer lab proveds access to various software prgrams and the WWW. For more information check the World Wide Web page at: http://www.louisville.edu/library/kersey

Kornhauser Health Sciences Library

The Kornhauser Health Sciences Library located in downtown medical center, meets the Information needs of the Schools of 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 213,500 volumes and 3,108 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

Information Technology Services

U of L's Information Technology unit (IT) is responsible for planning, implementation, deployment, and management of information technology services in support of the instructional, research, administrative, and service programs of the University. These IT services include:

- Computing,
- Communications,
- Printing, publications, and copying,
- Imaging and television services,
- Instructional technology/instructional support.

Computing Services

The centralized computing systems at U of L are undergoing constant expansion. The University supports office automation, administrative applications, library catalog, statistical analysis and database applications on large centralized systems. The majority of the University's administrative systems operate using PeopleSoft applications running on large IBM AIX (Unix) systems. Legacy administrative systems are supported on an IBM OS/390 system.

Academic computing, statistical analysis, database, and other computing functions are also supported using IBM Unix-based systems. The University's library catalog and circulation systems is supported by an IBM Unix server using the Endeavor/Voyager system.

These centralized computing systems, located in the Miller Information Technology Center, are accessed across the University by almost 10,000 workstations in offices, user centers and departments, and via dial-up remote access service.

Computer accounts for Unix systems, E-mail, and GroupWise are available to students, faculty, and staff for university-related educational and administrative purposes.

The university supports Novell NetWare as the standard for print and file services in local area networks. Office automation functions (integrating E-mail and calendars) are supported by Novell GroupWise, and basic E-mail services are available through a Unix E-mail system.

Two large computing user centers on the Belknap campus and one on the Health Sciences campus (along with numerous smaller facilities) are available for access to University networks and computing resources. Public computing laboratories are located in the Miller Information Technology Center and the College of Business and Public Administration on the Belknap Campus, in the Instructional Building B on the Health Sciences campus, and in Burhans Hall on the Shelby Campus. Together, these centers provide over 200 public workstations for access to U of L information resources and the Internet. Additional public workstations in high-traffic locations provide access to E-mail.

IT Information Systems

The IT Information Systems unit is responsible for acquisition, development, implementation, maintenance, and enhancements to the University's administrative support applications.

IT Operations Center and Data Center Services

The IT Operations Center operates and maintains the University's centralized host and server systems, and manages the University's public computing user centers, while IT Data Center Services provides security and account management services, and provides technical support for the University's centralized host and server systems, including the centralized web servers.

Consulting Services

IT Consulting Services provides support for users of the University's systems, focusing on technology planning, research computing, workstation consulting, software site licenses and resale, and provides coordination for two-tier (departmental computing).

Communications Services

The University's wide area network provides access to the Internet and campus computing resources. IT Communications Services is responsible for the installation, operation, and maintenance of the high-speed campus network, and the University's telephone systems.

The University's communications networks provide voice, data, and video services to campus locations. The University metropolitan area data network includes 44 miles of fiber optic cable that interconnects the three campuses (Belknap, Health Sciences, and Shelby) and incorporates high-speed fiber optic network between buildings.

Video service is currently provided over broadband cable on campus.

Microwave links can be used between campuses. A satellite uplink is used for uplink to Kentucky Educational Television (KET) Star Channels system. The University is licensed for Instructional Television Fixed Service (ITFS) and is member of KET.

Campus telephone service is implemented as a Centrex (central office-based) single line strategy. Future plans call for support of IP video and voice-over-IP services.

The University is host to a high-speed Internet access point used to support the Internet needs of Postsecondary education across the state. By Fall 2001, this access point will be upgraded to use an OC-3 (155Mbps) connection from a major national Internet service provider. The University is also a member of Internet2 and plans to have connectivity through the Internet2 Project Abilene network at 155Mbps (OC-3) by Fall 2001.

The University operates a low-cost dial-up Internet service (called UofL.net Remote) for the University's faculty, staff, and students. This service has over 300 ports supporting up to 56Kbps service.

The University participates as a node of the KTLN (Kentucky Tele-Linking Network) which provided interactive teleconferencing facilities across the state of Kentucky.

Printing, Publications, and Copy Services
UofL.Print offers a full range of printing and publications services, including layout, graphical design, press operations and binding services. Six copy center (CopyIT) locations provide photocopying, high-speed duplicating, and document preparation services with a wide variety of finishing options. The CopyIT centers support preparation and distribution of instructional packets, and provide copyright clearance services.

Imaging and Television
The IT Imaging and Television unit provides visualization technology and expertise to support instruction, research and service at all University of Louisville campuses.

Photographic service includes medical, clinical and scientific documentation; studio and location photography; digital photography, scanning, imaging and printing, complete film processing and darkroom services.

Graphics services include web site design and maintenance; 3D modeling and animation; medical and scientific illustration; multimedia design; scientific exhibit and research poster design/preparation; image scanning, manipulation and imaging; slide imaging; manuscript illustration, and graphics application consulting and support.

Television services include distance education production and support; digital video encoding, video streaming and DVD authoring; television studio and field production; video recording and editing; video tape duplication; satellite TV and compressed video teleconferencing support including uplink and downlink coordination; instructional design, script writing and media development.

Instructional Technology/Instructional Support
Instructional Technology/Instructional Support (IT/IS) provides instructional media services and consultation on the applications of technology to instruction and research programs. Support services are available through IT/IS offices at the Belknap and Health Sciences campuses, and through the University Center for Continuing and Professional Education (UCCPE) on Shelby campus.

Contact IT/IS for: classroom support media equipment scheduling and distribution; projection services for conventions and special programs; technical assistance and classroom design; Medical School and Dental School microscope rental; teleconference and tele-course coordination; planetarium programs; and software training through short courses.

Additional information concerning Information Technology services can be found on the UofL web pages at http://www.louisville.edu/it/

University Services

International Center

The International Center is the university-wide clearing house of information and resources for UofL faculty, students, and researchers involved in academic exchanges, overseas "live and learn" opportunities, and academic research. The International Center promotes energetically the internationalization efforts of the University. It provides advice and counsel to UofL faculty, students, and researchers traveling abroad and assistance to international students, faculty, and researchers coming to UofL for study or work.

In fulfillment of this Mission, the International Center:

- Recruits and support faculty and administrators who participate in international teaching, research, or service opportunities through academic exchange, consortia programming, or grants for overseas travel.
- Promotes and assists students participating in education abroad activities, including consortia programs, educational exchanges, internships, service learning programs, and scholarships.
- Serves as the University's designated School Official for INS and as Responsible Officer for the U.S. Department of State's Exchange Visitor Program; coordinates and provides programs and services for internationals students and scholars, including immigration advice; assistance in academic and cross-cultural adaptation; recruitment and retention strategies; and advocacy.
- Works cooperatively with UofL's Institute for International Development by providing services to the University's student studying in its overseas-based programs as appropriate.
- Seeks external funding to promote international programs and activities within the University and the community at large.
- Assists academic units in the development of educational exchange agreements with foreign institutions and serves as the primary recipient for such documents.
- Cooperates actively with the City and Commonwealth's initiatives to foster internationalization. Represents UofL with national and international organizations in matters pertaining to international education.

E-mail: intcent@gwise.louisville.edu

Website:
http://www.louisville.edu/student/services/intcent

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 600 students from over 60 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 University of Louisville 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 for physicians visits at the Student Health Service offices on Belknap Campus and Health Sciences Center Campus. 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. *GTAs, GTSs and GRAs receiving a stipend check from the University receive the Broad Plan coverage as a benefit of their employment. If you believe you are eligible for this benefit please check with your department to verify your coverage.* Dependent coverage is available. Please call Student Health at (502) 852-6479.

2. **The Health Service Plan** is not an insurance plan and does not cover hospital services or physician's visits outside of the University Health 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. The Student Health Service Clinics are located on Belknap Campus, in the Student Health & Counseling Building, between the Student Activities Center and the Houchens Building and on the Health Sciences Campus on the first floor of the Ambulatory Care Building .

For more Information and appointments, please call Student Health at (502) 852-6479, Belknap and 852-6446, HSC.

Student Affairs

The mission of the division of Student Affiars is to provide students with effective services and developmental opportunities that augment their academic experience and enhance the quality of their lives while enrolled at the University of Louisville. When coupled with a challenging academic experience, these services and opportunities facilitate the students' total development so that they attain their educational goals ls as individuals prepared to funtion successfully as leaders within a diverse, multicultural and international world. In support of this mission, the Division provides essential services to the faculty and to the academic units.

The Vice President for Student Affairs, 203 Grawmeyer Hall, administers and oversees non-acadmic services and programming for students. The Division of Student Affairs is responsible for:

Student Services: Admissions, Orientation, and Testing Services; Financial Aid; Registrar; Commencement; and Residency.

Student Life: Housing and Residence Life, Intramural and Recreational Sports, Student Activities, Greek Life and Recognized Student Organizations, Student Government Association, ACCESS, Service Learning, and Student Discipline.

Other Programs and Services: Disability Resource Center, Counseling Center, University Career Center, International Service Learning Program, and Multicultural Center.

Residency Policy and Fees

13 KAR 2:045. Determination of Residency Status for Admission and Tuition Assessment Purposes

Council on Postsecondary Education Administrative Regulation

RELATES TO: KRS Chapter 13B, 164.020, 164.030, 164A.330(9)

STATUTORY AUTHORITY: KRS 164.020(8)

NECESSITY, FUNCTION, AND CONFORMITY: KRS 164.020(8) requires the Council on Postsecondary Education to determine tuition and approve the minimum qualifications for admission to a state-supported postsecondary education institution and authorizes the Council to set different tuition amounts for residents of Kentucky and for nonresidents. This administrative regulation establishes the procedure and guidelines for determining the residency status of a student who is seeking admission to, or who is enrolled at, a state-supported postsecondary education institution.

Section 1. Definitions. (1) "Academic term" means a division of the school year during which a course of studies is offered, and includes a semester, quarter, or single consolidated summer term as defined by the institution.

(2) "Continuous enrollment" means enrollment in a state-supported postsecondary education institution at the same degree level for consecutive terms, excluding summer term, since the beginning of the period for which continuous enrollment is claimed unless a sequence of continuous enrollment is broken due to extenuating circumstances beyond the student's control, including serious personal illness or injury, or illness or death of a parent.

(3) "Degree level" means enrollment in a course or program which could result in the award of a:

(a) Certificate, diploma or other program award at an institution;

(b) Baccalaureate degree or lower including enrollment in a course by a nondegree-seeking postbaccalaureate student;

(c) Graduate degree or graduate certification other than a first-professional degree in law, medicine, dentistry or "Pharm. D"; or

(d) Professional degree in law, medicine, dentistry, or "Pharm. D".

(4) "Demonstration of Kentucky domicile and residency" means the presentation of documented information and evidence sufficient to prove by a preponderance of the evidence that a person is domiciled in Kentucky and is a resident of Kentucky.

(5) "Dependent person" means a person who cannot demonstrate financial independence from parents or persons other than a spouse and who does not meet the criteria established in Section 5 of this administrative regulation.

(6) "Determination of residency status" means the decision of a postsecondary education institution that may include a formal hearing that results in the classification of a person as a Kentucky resident or as a nonresident for admission and tuition assessment purposes.

(7) "Domicile" means a person's true, fixed, and permanent home and is the place where the person intends to remain, and to which the person expects to return if absent without intending to establish a new domicile elsewhere.

(8) "Full-time employment" means continuous employment for at least forty-eight (48) weeks at an average of at least thirty (30) hours per week.

(9) "Independent person" means a person who demonstrates financial independence from parents or persons other than a spouse and who can meet the criteria established in Section 5 of this administrative regulation.

(10) "Institution means an entity defined in KRS 164.001(10) if the type of institution is not expressly stated and includes the Kentucky Commonwealth Virtual University.

(11) "Kentucky residency" or "Kentucky resident" means the result of a determination by an institution that a person is a resident of Kentucky as determined by this administrative regulation.

(12) "Nonresident" means a person who is domiciled outside of Kentucky or who currently maintains legal residence outside Kentucky or who has not met the criteria for Kentucky residency established in this administrative regulation.

(13) "Preponderance of the evidence" means the greater weight of evidence, or evidence which is more credible and convincing to the mind.

(14) "Parent" means one (1) of the following:

(a) A person's father or mother; or

(b) A court-appointed legal guardian if:

1. The guardianship is recognized by an appropriate court within the United States;

2. There was a relinquishment of the rights of the parents; and

3. The guardianship was not established primarily to confer Kentucky residency on the person.

(15) "Residence" or "residency" means the place of abode of a person and the place where the person is physically present most of the time for a noneducational purpose in accordance with Section 3 of this administrative regulation.

(16) "Student financial aid" means all forms of payments to a student if one (1) condition of receiving the payment is the enrollment of the student at the institution.

(17) "Sustenance" means living expenses including room, board, maintenance, transportation, and also may include educational expenses including tuition, fees, books, and supplies.

Section 2. Scope. (1) State-supported postsecondary education institutions 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 postsecondary 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 postsecondary education shall be provided so far as feasible at reasonable cost to an individual who is domiciled in Kentucky and who is a resident of Kentucky.

(2) The Council on Postsecondary Education requires a student who is neither domiciled in nor a resident of Kentucky to meet higher admission standards and to pay a higher level of tuition than resident students.

(3) This administrative regulation applies to all student residency determinations regardless of circumstances, including the Southern Regional Education Board contract spaces; reciprocity agreements, where appropriate; the Kentucky Commonwealth Virtual University and academic common market programs.

Section 3. Determination of Residency Status; General Rules. (1) A determination of residency shall include:

(a) An initial determination of residency status by an institution during the admission process or upon enrollment in an institution for a specific academic term or for admission into a specific academic program;

(b) A reconsideration of a determination of residency status by an institution based upon a changed circumstance; and

(c) A formal hearing conducted by an institution upon request of a student after other administrative procedures have been completed.

(2) An initial determination of residency status shall be based upon:

(a) The facts in existence when the credentials established by an institution for admission for a specific academic term have been received and during the period of review by the institution;

(b) Information derived from admissions materials;

(c) Other materials required by an institution and which are consistent with this administrative regulation; or

(d) Other information available to the institution from any source.

(3) An individual seeking a determination of Kentucky residency status shall demonstrate that status by a preponderance of the evidence.

(4) A determination of residency status shall be based upon verifiable circumstances or actions.

(5) Evidence and information cited as the basis for Kentucky domicile and residency shall accompany the application for a determination of residency status.

(6) A student classified as a nonresident shall retain that status until the student is officially reclassified by an institution.

(7) A student may apply for a review of a determination of residency status once for each academic term.

(8) If an institution has information that a student's residency status may be incorrect, the institution shall review and determine the student's correct residency status.

(9) If the Council on Postsecondary Education has information that an institution's determination of residency status for a student may be incorrect, it may require the institution to review the circumstances and report the results of that review.

(10) An institution shall impose a penalty or sanction against a student who gives incorrect or misleading information to an institutional official, including payment of nonresident tuition for each academic term for which resident tuition was assessed based on an improper determination of residency status. The penalty may also include:

(a) Student discipline by the institution through a policy written and disseminated to students; or

(b) Criminal prosecution.

Section 4. Presumptions Regarding Residency Status. (1) In making a determination of residency status, it shall be presumed that a person is a nonresident if:

(a) A person is, or seeks to be, an undergraduate student and admissions records show the student to be a graduate of an out-of-state high school;

(b) A person's admissions records indicate the student's residence to be outside of Kentucky at the time of application for admission;

(c) A person moves to Kentucky primarily for the purpose of enrollment in an institution;

(d) A person moves to Kentucky and within twelve (12) months enrolls at an institution more than half time; or

(e) A person has a continuous absence of one (1) year from Kentucky.

(2) A presumption arising from subsection (1) of this section shall be overcome by a demonstration of Kentucky domicile and residency.

Section 5. Determination of Whether a Student is Dependent or Independent. (1) In a determination of residency status, an institution shall first determine whether a student is dependent or independent. This provision is predicated on the assumption that a dependent person lacks the financial ability to live independently of the person upon whom the student is dependent and therefore lacks the ability to form the requisite intent to establish domicile.

(2) In determining the dependent or independent status of a person, the following information shall be considered as well as other relevant information available at the time the determination is made:

(a)1. That the person has not been claimed as a dependent on the federal or state tax returns of a parent or other person for the year preceding the date of application for a determination of residency status; or

2. That the person is no longer claimed by a parent or other person as a dependent or as an exemption for federal and state tax purposes; and

(b) That the person has financial earnings and resources independent of a person other than an independent spouse necessary to provide for the person's own sustenance.

(3) An individual who enrolls at an institution immediately following graduation from high school and remains enrolled shall be presumed to be a dependent person unless the contrary is evident from the information submitted.

(4) Domicile may be inferred from the student's permanent address, parent's mailing address, or location of high school of graduation.

(5) Marriage to an independent person domiciled in and who is a resident of Kentucky shall be a factor considered by an institution in determining whether a student is dependent or independent.

(6) Financial assistance from or a loan made by a parent or family member other than an independent spouse, if used for sustenance of the student:

(a) Shall not be considered in establishing a student as independent; and

(b) Shall be a factor in establishing that a student is dependent.

Section 6. Effect of a Determination of Dependent or Independent Status on a Determination of Residency Status. (1) The effect of a determination that a person is dependent shall be as follows:

(a) The domicile and residency of a dependent person shall be the same as either parent. The domicile and residency of the parent shall be determined in the same manner as the domicile and residency of an independent person.

(b) The domicile and residency of a dependent person whose parents are divorced, separated, or otherwise living apart shall be Kentucky if either parent is domiciled in and is a resident of Kentucky regardless of which parent has legal custody or is entitled to claim that person as a dependent pursuant to Kentucky income tax provisions.

(c)1. If the parent or parents of a dependent person are Kentucky residents and are domiciled in Kentucky but subsequently move from the state, the dependent person shall be considered a resident of Kentucky while in continuous enrollment at the degree level in which currently enrolled.

2. If continuous enrollment is broken or the current degree level is completed, the dependent person's residency status shall be reassessed when the circumstances detailed in subparagraph 1 of this paragraph are present.

(2) If the sole parent or both parents of a dependent person moves out of state, Kentucky domicile and residency, having been previously established, shall be retained until steps are taken to establish domicile and residency elsewhere.

Section 7. Member of Armed Forces of the United States, Spouse and Dependents; Effect on a Determination of Residency Status. (1) A member, spouse, or dependent of a member whose domicile and residency was Kentucky at the time of induction into the Armed Forces of the United States, and who maintains Kentucky as home of record and permanent address, shall be entitled to Kentucky residency status:

(a) During the time of active service; or

(b) If the member, spouse, or dependent returns to this state within six (6) months of the date of the member's discharge from active duty.

(2)(a) A member, spouse or dependent of a member of the Armed Forces of the United States stationed in Kentucky on active military orders shall be considered a Kentucky resident while the member is on active duty in this state pursuant to those orders if the member is not:

1. Stationed in Kentucky for the purpose of enrollment at an institution; or

2. On temporary assignment of less than one (1) year.

(b) A member, spouse or dependent of a member, shall not lose Kentucky residency status if the member is thereafter transferred on military orders while the member, spouse or dependent requesting the status is in continuous enrollment at the degree level in which currently enrolled.

(3) Membership in the National Guard or civilian employment at a military base alone shall not qualify a person for Kentucky residency status under the provisions of subsections (1) and (2) of this section.

(4) A person's residency status established pursuant to this section shall be reassessed if the qualifying condition is terminated.

Section 8. Status of Nonresident Aliens; Visas and Immigration. (1)(a) A person holding a permanent residency visa or classified as a political refugee shall establish domicile and residency in the same manner as another person.

(b) Time spent in Kentucky and progress made in fulfilling the conditions of domicile and residency prior to obtaining permanent residency status shall be considered in establishing Kentucky domicile and residency.

(2) A person holding a nonimmigrant visa with designation A, E, G, H, I, L, N, O, P, R, S, TD or TN shall establish domicile and residency the same as another person.

(3)(a) An independent person holding a nonimmigrant visa with designation B, C, D, F, J, K, M, or Q shall not be classified as a Kentucky resident, because that person does not have the capacity to remain in Kentucky indefinitely and therefore cannot form the requisite intent necessary to establish domicile within the meaning of this administrative regulation.

(b) A dependent person holding a visa as described in paragraph (a) of this subsection, but who is a dependent of a parent holding a visa as described in subsection (2) of this section, shall be considered as holding the visa of the parent.

(c) A dependent person holding a visa described in subsection (2) of this section or paragraph (a) of this subsection, if a parent is a citizen of the United States and is a resident of and domiciled in Kentucky, shall be a resident of Kentucky for the purposes of this administrative regulation.

Section 9. Beneficiaries of a Kentucky Educational Savings Plan Trust. A beneficiary of a Kentucky Educational Savings Plan Trust shall be granted residency status if the beneficiary meets the requirements of KRS 164A.330(9).

Section 10. Criteria Used in a Determination of Residency Status. (1) A determination of Kentucky domicile and residency shall be based upon verifiable circumstances or actions. A single fact shall not be paramount, and each situation shall be evaluated to identify those facts essential to the determination of domicile and residency.

(2) The following facts, although not conclusive, shall have probative value in their entirety and shall be individually weighted, appropriate to the facts and circumstances in each determination of residency:

(a) Acceptance of an offer of full-time employment or transfer to an employer in Kentucky or contiguous area while maintaining residence and domicile in Kentucky;

(b) Continuous physical presence in Kentucky while in a nonstudent status for the twelve (12) months immediately preceding the start of the academic term for which a classification of Kentucky residency is sought;

(c)1. Filing of Kentucky resident income tax return for the calendar year preceding the date of application for a change in residency status; or

2. Payment of Kentucky withholding taxes while employed during the calendar year for which a change in classification is sought;

(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 based on a determination by that school that the person is a resident of Kentucky;

(f) Abandonment of a former domicile or residence and establishing domicile and residency in Kentucky with application to or attendance at an institution following and incidental to the change in domicile and residency;

(g) Obtaining licensing or certification for a professional and occupational purpose in Kentucky;

(h) Payment of real property taxes in Kentucky;

(i) Ownership of real property in Kentucky, if the property was used by the student as a residence preceding the date of application for a determination of residency status;

(j) Long-term lease of at least twelve (12) consecutive months of noncollegiate housing;

(k) Marriage of an independent student to a Kentucky resident;

(l) Continued presence in Kentucky during academic breaks; and

(m) The extent to which a student is dependent on student financial aid in order to provide basic sustenance.

(3) Except as provided in subsection (4) of this section, the following facts, because of the ease and convenience in completing them, shall have limited probative value in a determination that a person is domiciled in and is a resident of Kentucky:

(a) Kentucky automobile registration;

(b) Kentucky driver's license; and

(c) Registration as a Kentucky voter.

(4) The absence of a fact contained in subsection (3) of this section shall have significant probative value in determining that a student is not domiciled in or is not a resident of Kentucky.

(5) Kentucky residency status shall not be conferred by the performance of an act which is incidental to fulfilling an educational purpose or by an act which is performed as a matter of convenience. Mere physical presence in Kentucky, including living with a relative or friend, shall not be sufficient evidence of domicile and residency.

Section 11. Effect of a Change in Circumstances on Residency Status. (1) If a person becomes independent or if the residency status of a parent or parents of a dependent person changes, an institution shall reassess residency either upon a request by the student or a review initiated by an institution.

(2) Upon transfer to a Kentucky institution, a student's residency status shall be reassessed by the receiving institution.

(3) A reconsideration of a determination of residency status for a dependent person shall be subject to the provisions for continuous enrollment, if applicable.

Section 12. Student Responsibilities. (1) A student shall register under the proper residency classification which includes the following actions:

(a) Raising a question in a timely manner concerning residency classification;

(b) Making application for change of residency classification in a timely manner with the designated office or person at the institution; and

(c) Notifying the designated office or person at the institution immediately upon a change in residency.

(2) If a student fails to notify an institutional official of a change in residency, an institutional official may investigate and evaluate the student's current residency status.

(3)(a) If a student fails to provide, by the date specified by the institution, information required by an institution in a determination of residency status, the student shall be notified by the institution that the review has been canceled and that a determination has been made.

(b) Notification shall be made by registered mail, return receipt requested.

(c) Notification shall be made within ten (10) calendar days after the deadline for receipt of materials has passed.

(4) A student shall not be entitled to appeal a determination of residency status if the determination made by an institution is because a student has failed to meet published deadlines for the submission of information as set forth in subsection (3) of this section. A student may request a review of a determination of residency status in a subsequent academic term.

Section 13. Institutional Responsibilities. Each institution shall:

(1) Provide for an administrative appeals process that includes a residency appeals officer to consider student appeals of an initial residency determination and which shall include a provision of fourteen (14) days for the student to appeal the residency appeals officer's determination.

(2) Establish a residency review committee to consider appeals of residency determinations by the residency appeals officer. The residency review committee shall make a determination of student residency status and notify the student in writing within forty-five (45) days after receipt of the student appeal.

(3) Establish a formal hearing process as described in Section 14 of this administrative regulation.

(4) Establish written policies and procedures for administering the responsibilities established in subsections (1), (2), and (3) of this section and that are:

(a) Approved by the institution's governing board;

(b) Made available to all students; and

(c) Filed with the council.

Section 14. Formal Institutional Hearing. (1) A student who appeals a determination of residency by a residency review committee shall be granted a formal hearing by an institution if the request is made by a student in writing within fourteen (14) calendar days after notification of a determination by a residency review committee.

(2) If a request for a formal hearing is received, an institution shall appoint a hearing officer to conduct a formal hearing. The hearing officer:

(a) Shall be a person not involved in determinations of residency at an institution except for formal hearings; and

(b) Shall not be an employee in the same organizational unit as the residency appeals officer.

(3) An institution shall have written procedures for the conduct of a formal hearing that have been adopted by the board of trustees or regents, as appropriate, and that provide for:

(a) A hearing officer to make a recommendation on a residency appeal;

(b) Guarantees of due process to a student that include:

1. The right of a student to be represented by legal counsel; and

2. The right of a student to present information and to present testimony and information in support of a claim of Kentucky residency.

(c) A recommendation to be issued by the hearing officer.

(4) An institution's formal hearing procedures shall be filed with the Council on Postsecondary Education and shall be available to a student requesting a formal hearing.

Section 15. Cost of Formal Hearings. (1) An institution shall pay the cost for all residency determinations including the cost of a formal hearing.

(2) A student shall pay for the cost of all legal representation in support of the student's claim of residency. (17 Ky.R. 2557; eff. 4-5-91; Am. 22 Ky.R. 1656; 1988; eff. 5-16-96; 23 Ky.R. 3380; 3797; 4099; eff. 6-16-97; 24 Ky.R. 2136; 2705; 25 Ky.R. 51; eff. 7-13-98; 25 Ky.R. 2177; 2577; 2827; eff. 6-7-99.)

Tuition

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

2001-2002 Tuition

Graduate Resident		Graduate Non-Resident	
Hours	Total Tuition and Fees	Hours	Total Tuition and Fees
1.00	$235	1.00	$642
2.00	$470	2.00	$1,284
3.00	$705	3.00	$1,926
4.00	$940	4.00	$2,568
5.00	$1,175	5.00	$3,210
6.00	$1,410	6.00	$3,852
7.00	$1,645	7.00	$4,494
8.00	$1,880	8.00	$5,136
9.00 and above	$2,067	9.00 and above	$5,743

Additional course fees are listed under courses where applicable. These fees may be added or changed without prior notice.

NOTE: University tuition and refunds are subject to approval of the Board of Trustees and may be changed without prior notice.

You may check the most current information on the web at: **http://www.louisville.edu,** CURRENT STUDENTS, BURSAR'S OFFICE, STUDENT INFORMATION, and TUITION.

Degree Application Fees

Each master's degree applicant will be 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 $235.00
Master's Candidacy Status Fee.....$235.00

Privilege Fees

International Student Fee:
-Fall/Spring $50.00
-Summer $25.00
Replacement diploma $20.00
Transcript*.....$5.00

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

E-Mail Notification

THE REGISTRAR'S OFFICE WILL USE THE E-MAIL SYSTEM TO REMIND STUDENTS OF SOME ACADEMIC AND FINANCIAL DEADLINES AS WELL AS NOTIFICATION OF CANCELLED COURSES. PLEASE PLAN TO CHECK YOUR CAMPUS E-MAIL ACCOUNT REGULARLY, ESPECIALLY THE WEEK PRIOR TO THE BEGINNING OF CLASSES AND THE FIRST SEVERAL WEEKS OF EACH SEMESTER.

Registration and Financial Settlement

CONTINUING REGISTRATION - Tuition and fees are due on, or before, the designated due date for the semester. Payment may be made by cash, check, money order, charge card (MasterCard, Visa), or financial aid credit. 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.

Failure to receive a Statement of Account will not relieve the student of the responsibility for making financial settlement by the designated due date. Continuing registrations which are not financially settled by the designated due date will be placed on financial hold and affected students will be notified that they are not permitted to add or swap classes until their student account is financially settled; accounts not settled by the specified date in the notice will have their course registration cancelled. The Continuing Registration designated due dates are listed in the current Schedule of Courses.

REGULAR REGISTRATION - Students who register after Continuing Registration should be prepared to fully settle financial obligations by the last day to drop/add for the semester . (See FINANCIAL SETTLEMENT OPTIONS section below.) Failure to fully settle financial obligations may result in financial penalties and/or course cancellation.

FINANCIAL PENALTIES - Students whose accounts are not paid by established semester deadlines may be subject to course cancellation. Students with unpaid account balances will be placed on Financial Hold by the Bursar's Office. Students placed on Financial Hold become ineligible for further registration and transcripts will not be released until the student account is paid in full. A late payment fee of $50.00 may be assessed when student accounts are not paid by the last day to drop/add.

A student whose payment is not honored by the bank on which it was drawn may be assessed a return payment fee. If restitution is not made within 10 days of notification, the student may be subject to course cancellation and/or legal action.

Debtors who do not make satisfactory payment arrangements on their past due accounts may have their accounts placed with a collection agency. It is the policy of the University that unpaid accounts will be assessed the costs and expenses of collection, including attorney fees.

WITHDRAWAL POLICY - The effective withdrawal date is the date on which the withdrawal is processed in the Student Records System. This date is used in calculating any applicable tuition reduction.

TUITION REDUCTIONS - When a student officially withdraws from the University or from any course, or courses, for which hourly tuition rates apply, tuition and student activity fee charges will be adjusted according to the TUITION REDUCTION SCHEDULE printed in the Schedule of Courses (see Table of Contents). The full amount of tuition/fee charges for the semester will be due unless the withdrawal occurs during the TUITION REDUCTION period.

Special course fees are refundable only with 100% adjustment

FINANCIAL AID RECIPIENTS - Determinations regarding refunds of resulting credit balances will be based on regulations governing the financial aid awarded to the student.

Federal regulations mandate that students have the right to cancel all or a portion of an EFT loan disbursement and have the loan proceeds returned to the lender. To request cancellation of all or a portion of your loan, contact the Financial Aid Office in writing. (Financial Aid Office, University of Louisville, Louisville KY 40292)

Financial Settlement Options

FINANCIAL SETTLEMENT OPTIONS FOR CONTINUING REGISTRATION - Tuition and fees are due on, or before, the due date. CONTINUING REGISTRATIONS that are not financially settled by the due date will be placed on financial hold and affected students will be notified that they are not permitted to add or swap classes until their student account is financially settled; accounts not settled by the specified date in the notice will have their course registration cancelled.

CONTINUING REGISTRATION students will be allowed to validate their course registration by having anticipated financial aid for the current enrolled semester or by making a $50.00 payment toward current enrolled semester registration charges. Financial settlement for all students is due by the end of the first week of classes.

For those students with anticipated financial aid and a previous semester balance, the anticipated financial aid for the current semester must be large enough to cover both current and previous semester charges. The $50.00 payment does not apply to previous semester charges; for CONTINUING REGISTRATION to be valid students must pay all previous semester charges plus $50.00.

CONTINUING REGISTRATION PAYMENT PLAN - You may participate in this program by paying 25% of your anticipated charges for the Fall or Spring semester and a processing fee of $25.00 (Non-Refundable). To activate this option, complete and return the appropriate CRPP form in this Schedule of Courses. The appropriate semester form and the required down payment must be received by the date specified in the Schedule of Courses. Forms that are improperly completed, illegible, unsigned and/or do not contain the required down payment will not be processed. Please read carefully the repayment terms of the Continuing Registration Payment Plan promissory note before signing. Questions regarding the exact down payment required to participate in this program should be directed to the Bursar's office (852-6503).

THE CONTINUING REGISTRATION PAYMENT PLAN IS NOT OFFERED DURING THE SUMMER SEMESTER.

Please see the information below regarding THIRD-PARTY BILLING, TUITION REIMBURSEMENT and SHORT-TERM LOAN.

FINANCIAL SETTLEMENT OPTIONS FOR REGULAR REGISTRATION - Information regarding tuition and fee charges (including housing charges) will be given on the Touch-tone system. Please do not hang up before hearing your student account balance after each Touch-tone Registration session. Students who register by Touch-tone during the REGULAR REGISTRATION period are expected to pay their charges based on the information available from the Touch-tone System. A Statement of Account will not be mailed. Please contact the Bursar's Office (852-6503) for information regarding the tuition/fee charges and other assessments on the student's account. You may also look at your student account on the web at: http://www.louisville.edu, Current Students, Bursar's Office, Summary of Account.

Students who register during REGULAR REGISTRATION will be expected to have their student account financially settled by the last day to drop/add. A late payment fee of $50.00 may be assessed when student accounts are not financially settled by the last day to drop/add. Students with outstanding balances will be notified of their outstanding balance and that they will be cancelled from their classes if they do not complete financial settlement by a specified date. If a student is cancelled from classes, the reinstatement process will require the approval of the student's enrollment unit and payment of a $50.00 reinstatement fee.

If you expect financial aid to cover any portion of your semester charges, and you are not informed at the time of registration that you qualify for financial aid, you should check with the Student Financial Aid Office. If your financial aid is not credited to your account or received for disbursement to you, you must settle your account in full or you may be subject to a late payment fee of $50.00. Please see the anticipated aid information under the STUDENT FINANCIAL AID section.

PAYMENT: Payment may be made by check or money order. Make the check or money order payable to "U of L" or "University of Louisville". Please put the student's ID number on the front of the check. Payments sent by mail may take several days to be processed.

Students may also pay by credit card (MasterCard or Visa) through Touch-tone. If the Touch-tone option is unavailable, use the CREDIT CARD INFORMATION FORM in the Schedule of Courses. Students whose credit card payments are disapproved will be notified by the Bursar's Office.

THIRD-PARTY BILLING: If your tuition and fees are paid in full, or in part, by a third party, you must have an approved authorization form with specific billing instructions from the company or agency responsible for payment. Use the REMITTANCE FORM in the Schedule of Courses for the appropriate semester to forward the authorization and the balance of fees not paid by the third party to the Bursar's Office. Sometimes authorization forms are sent directly to the Bursar's Office. It is the student's responsibility to make sure that the Bursar's Office has the authorization form on file. Any questions should be directed to the Bursar's Office (852-6503).

TUITION REIMBURSEMENT: If your employer will reimburse you for tuition charges upon receipt of your grades for the semester, you may wish to apply for participation in this program. To activate this option, the student must complete and return the form in the Schedule of Courses. Please read carefully the repayment terms of the Tuition Reimbursement Program - Deferred Payment Agreement before signing. Forms that are improperly completed, illegible, unsigned and/or do not contain the required PROCESS FEE will not be processed. Any questions should be directed to the Bursar's Office (852-6503).

SHORT-TERM LOAN: You may participate in this program by paying 33 1/3% (one third) of your anticipated charges for the semester, a PROCESS FEE of $25.00 (Non-Refundable), and any other amounts due. To activate this option, the student must complete and return the appropriate semester form in the Schedule of Courses. Please read carefully the repayment terms of the Short-Term Loan - Deferred Payment Agreement before signing. Forms that are improperly completed, illegible, unsigned and/or do not contain the required down payment will not be processed. Any questions should be directed to the Bursar's Office (852-6503).

If you have been classified as a non-resident student and wish to make a SHORT-TERM LOAN to help pay your semester charges, your down payment must be based on the non-resident semester charges.

SHORT-TERM LOANS ARE NOT OFFERED DURING THE SUMMER SEMESTER.

FAILURE TO PAY UNIVERSITY OBLIGATIONS IN A TIMELY MANNER IN THE PAST MAY PREVENT YOU FROM PARTICIPATING IN THE UNIVERSITY PAYMENT PLAN PROGRAMS.

SENIOR CITIZEN TUITION REMISSION: The University offers tuition remission to individuals who are classified by Admissions as residents of Kentucky and are at least 65 years of age on, or before, the first day of classes for the semester. Special costs, such as course fees and parking, are not covered by this program and are the financial responsibility of the student. Proof of age may be shown by presenting a driver's license or other age verification document at the Bursar's Office.

PAYMENT INFORMATION AND PAYMENT PLAN FORMS ARE AVAILABLE ON THE WEB AT: http://www.louisville.edu, CURRENT STUDENTS, BURSAR'S OFFICE, STUDENT INFORMATION, PAYMENT OPTIONS.

Financial Aid

If financial assistance is required, applications may be obtained from the Student Financial Aid Office. 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 or visit our website www.louisville.edu/student/services/fin-aid.

Financial Aid Recipients

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

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.

Tuition-Fee Reduction

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 Tuition	Charge Credit
Withdrawal through the first week of semester	0%	100%
Withdrawal during second or third week of semester	50%	50%
Withdrawal during fourth week of semester	75%	25%
Withdrawal after fourth week of semester	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.

Special course fees 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, health insurance, 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, health insurance, 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 February 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 Department of Leadership, Foundations and Human Resources Educaton and Higher Education at the College of Education and Human Development.

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 at www.louisville.edu/student/services/fin-aid.
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 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 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.

Complete copies of the Code of Student Conduct are available from the Office of Student Life, Student Activities Center.

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 Assistant 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 and all of its programs. 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.

We at the University of Louisville have begun programs in the past few years to combat the misuse and abuse of alcohol and other chemical substances. We realize; however, that only through a concerted effort by all, can we make any major strides in preventing substance abuse. The following is the University of Louisville's Drug-Free Schools Notice:

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 and Student Health Services provide assessment and referral services to University students, as well as serving as an alcohol and other drug information/education resource. 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.

Department/Program Information

Accountancy (ACCT)

www.louisville.edu/academicprograms/accountancy.htm

Faculty

Director
Julia N. Karcher, 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
Alan Attaway, Associate Dean, College of Business and Public Administration
Archie W. Faircloth
Benjamin P. Foster
Richard M. Walter

Master of Accountancy

Major: ACCY
Degree: MAC
Unit: GB

Mission of the School of Accountancy

To meet the needs of our constituents:

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

Objectives

The objective of the Masters of Accountancy (MAC) Program is to provide candidates with the necessary skills and knowledge to begin successful careers as certified public accountants.

General Information

The degree program is available to qualified individuals possessing a bachelor's 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 MAC program.

The MAC 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 courses is offered during the two summer sessions.

Admission Procedures

Admission into the MAC program is competitive. The procedures for admission into the MAC program are as follows:

1. Submit a completed graduate application to the University of Louisville Admissions Office. There is a $25 application fee (on-line at www.graduate.louisville.edu). 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. If circumstances prevent an applicant from meeting the deadline, the applicant needs to contact the MAC counselor.
2. Official transcripts verifying the receipt of a baccalaureate degree from an accredited institution must be submitted to the Admissions Office.
3. The Graduate Management Admission 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 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.
4. 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.
5. 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.
6. 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 (IESL) 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 MAC program. Acceptance to the Intensive English Program does not constitute acceptance to the MAC program. For information and application forms, write to IESL, University of Louisville, Louisville, KY 40292.

Academic Policies

The following standards apply to all MAC degree candidates:

1. A faculty member teaching a graduate-level course may assign a grade with either a plus (e.g., B+) or minus (e.g., B-). See section on Academic Policies and Requirements (Grading System).
2. Upon admission to the program, a 3.0 grade point average must be maintained. The calculations exclude transfer work.
3. 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 (in terms of academic standing).
4. A maximum of six hours in 600-level courses with a grade of "C" may count toward the completion of degree requirements.
5. A student who has received a grade of "C", "D", or "F" may repeat the course upon approval of the Graduate Dean and the MAC 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.
6. 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. A part-time student (8 or less 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, the student will be dismissed from the program.
7. 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 MAC counselor requesting re-admission. Such a request must be submitted at least 40 days prior to the semester in which enrollment is requested.
8. Students are restricted to no more than 3 hours of independent study

Visiting Students

A student visiting from another university may take the MAC 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 MAC student who wishes to be a visiting student at another academic institution for a particular semester must obtain permission from the MAC 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 MAC 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 MAC 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 MAC counselor for re-admission. 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. A transfer of credits is possible only after earning six hours from the University of Louisville College of Business and Public Administration. Students wishing to transfer credit should make a request to the MAC counselor. Final approval of the transfer of credit must come from the Graduate School.

Honors

Students who complete the MAC 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 MAC 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 MAC 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 (or longer) are required to contact the MAC counselor for re-admission. Based on the request of the School, the Graduate Dean will consider the student for readmission.

Master of Accountancy Foundation Content

The foundation coverage must be completed prior to actual admission. The course numbers shown after the descriptions of the UofL courses would meet that foundation requirement.

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

The foundation coverage must be completed prior to actual admission to the MAC program.

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 615 Not-for-Profit and Governmental Accounting	2	
ACCT 621 Mergers and Consolidations	1	
ACCT 631 Federal Taxation	3	
ACCT 641 Financial Accounting & Professionalism	3	
ACCT 651 Auditing & Systems	6	
ACCT 655 Special Topic in Accounting	3	
CLAW 610 Commercial Law for Professional Accountants	3	
Professional Interest Area Electives	6	
Total Credit Hours		30

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.

Anatomical Sciences and Neurobiology (ASNB)

www.louisville.edu/medschool/anatomy/

Graduate Program Faculty

Chairman

Fred J. Roisen, Professor - Trophic factors; adult stem cells, 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 accessory 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.

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

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.

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

Associate Professors

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

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

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

Assistant Professors

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

Matthew Qiu - Spinal cord development, Molecular and genetic control of motor neuron and oligodendrocyte differentiation and regeneration. Embryonic stem cells.

Guillermo W. Rougier - Comparative anatomy and embryology.

Brett R. Schofield (Director of Graduate Studies)- Functional organization of auditory circuits.

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.

Scott Whittemore - Molecular and cellular biological approaches (gene therapy, stem cells, and transplantation) to restore function in the injured spinal cord.

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

Emeritus/Emerita
James B. Longley - Histochemical aspects of kidney structure and function.
Frank J. Swartz - Somatic polyploidization; nuclear differentiation of pancreatic beta cells and hepatocytes.
Richard H. Swigart - Chronic hypoxia with emphasis on the cardiovascular system.
Charles E. Wagner - Gross anatomy.

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. Applicants 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 one course in the core curriculum (ASNB 601, 603, 615, 670, 671) and 606, Anatomy Seminar. 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 one major anatomy course (601, 603 or 615) and to present a limited number of lectures. In addition, each student must complete two lab rotations (ASNB 616) in the department holding at least six credit hours.

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 write a research proposal describing the thesis research and defend it in an oral exam in order to qualify for candidacy.

Master of Science in Anatomical Sciences and Neurobiology

Major: ASNB
Degree: MS
Unit: GM

Master's applicants are required to take two of the core curriculum courses of the department (ASNB 601, 603, 605, 615, 670, and 671). Registration in the Anatomy Seminar course ASNB 606 is required throughout the students time in residence. Students must complete six hours of Master's Thesis (ASNB 620-01) completeness of a research project of appropriate scope and the presentation and defense of an acceptable thesis are required for this degree.

Anthropology (ANTH)

www.louisville.edu/a-s/anthro

Graduate Program 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 (AUDI)

www.louisville.edu/medschool/surgery/comdisorders/audiology

Graduate Program Faculty

Professor
David R. Cunningham

Associate Professor
Ian M. Windmill, Director

Application Deadline

Except under unusual circumstances, students will be admitted for Fall semester only. Deadline for applications is January 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 January 1 of the application year. Criteria for admission to the program includes the following:

1. Completed application form; minimum undergraduate grade point average of 3.2 (on a 4.0 scale);
2. Appropriate undergraduate preparation (courses in the sciences, mathematics, etc.)
3. 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.
4. Three letters of recommendation; and
5. An interview with the admissions committee.

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

Doctor of Audiology

Major: AUDI
Degree: AuD.
Unit: GM

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 workers 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. The Kentucky Institute of Balance is a comprehensive program staffed by audiologists and physical therapists providing students the opportunity for a comprehensive experience in the assessment and management of vestibular disorders.

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 (BIOC)

www.louisville.edu/medschool/biochemistry/

Graduate Program Faculty

Acting Chair

Robert D. Gray, Professor - Design and application of metalloproteinase inhibitors in pathological conditions.

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.
Nancy C. Martin - Molecular biology of mitochondrial biogenesis and protein transport; RNA processing.
Russell A. Prough - Regulation of enzymes involved in foreign compound metabolism; biochemical mechanisms of toxicity and carcinogenesis.
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

Barbara J. Clark - Regulation of steroid hormone biosynthesis by trophic hormones.
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.
Pamela W. Feldhoff - Molecular mechanisms of complement component C9 mediated reactions, utilizing cell culture/cytokines and a hypoxia neonatal rat model.
Thomas E. Geoghegan - Biochemistry of gene expression in eukaryotes; carcinogenesis and DNA repair.
Carolyn M. Klinge - Estrogen regulation of gene expression
Thomas J. Wheeler - Membrane transport proteins, focusing on glucose transport in heart and other tissues.

Assistant Professors

Keith Cameron Falkner - Gene regulation of drug metabolizing enzymes.
Ronald Gregg - Function of the subunits of voltage-gated calcium channels in muscle contraction and central nervous systems function using gene targeting in mice.

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-Medical Oncology) Role of growth factors in cancer; squamous cell neoplastic transformation.
Jon B. Klein - (Primary Appointment: Department of Medicine-Nephrology) Applications of proteomics.
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.
Donald M. Miller - (Primary Appointment: Department of Medicine, Division of Internal Medicine and Hematology/Oncology) Molecular and clinical oncology; modulation of oncogene expression; triplex DNA based gene therapy, treatment of melanoma.
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.
Stephen J. Winters - (Primary Appointment: Department of Medicine-Division of Endocrinology and Metabolism). PACAP and gonadotropin secretion; monkey pituitary cells to study male infertility.
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.

Sham Kakar - (Primary Appointment: Department of Medicine). Molecular mechanism of causation and prevention of hormone related cancers.

Herbert Lassiter - (Primary Appointment: Department of Pediatrics) Cytokine regulation of complement component synthesis.

Joint Assistant Professors

Paula Jane Bates - (Primary Appointment: Department of Medicine, Division of Hematology/Oncology) Oligonucleotides as antiproliferative and anti-HIV agents.

Leighton Grimes - Primary Appointment: Department of Surgery-Division of Cellular Therapeutics) Molecular immunology 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.

John O. Trent - (Primary Appointment: Department of Medicine, Division of Hematology/Oncology) Structural biology of DNA (duplex, triplex & Quadruplex), DNA -ligand complexes, and DNA interacting proteins.

Associates

John Arthur
Douglas C. Borchman
William D. Ehringer
Y. James Kang
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
Calvin A. Lang
Robert S. Levy
Robert L. McGeachin

Adjunct Faculty

Walter M. Mastropaolo
Betty Jane Mills

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 two semesters of organic 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 and School of Medicine doctoral fellowships and by department teaching and research assistantships.

Doctor of Philosophy in Biochemistry and Molecular Biology

Major: BIOC
Degree: PHD
Unit: GM

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. 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. Course work will consist of BIOC 603, 605, 611, 645, 647, 650, 668, and 681. Electives 602, 640, 641, 660, 667, and 675 are also available.
3. Attendance at seminars and research conferences is required.
4. 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.
5. All Ph.D. students are required to assist in teaching for one semester during their 2nd or 3rd years.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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 MS Degree in Biochemistry

1. MS 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.
2. Course work will consist of BIOC 611, 613, 645, and 647. In addition, the MS student must take two of the following courses: BIOC 605, 650, 668, and 681.
3. One semester of BIOC 606 (Seminar) is required during the second year.
4. Students are required to attend seminars and research conferences.
5. 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.
6. There are no foreign language requirements for the MS degree in Biochemistry.
7. Students must present a 1-2 page research proposal for their thesis committee and orally defend that proposal.

Thesis

See dissertation description above.

Biology (BIOL)

www.louisville.edu/a-s/biology

Graduate Program Faculty

Chair
Ronald D. Fell, Professor

Professors
Ronald M. Atlas
Gary A. Cobbs
Charles V. Covell, Jr
Michael H. Perlin
William D. Pearson

Associate Professors
Paul A. Bukaveckas
Margaret M. Carreiro
Lee A. Dugatkin
Perri K. Eason
Arnold J. Karpoff
Joseph M. Steffen

Assistant Professors
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 (thesis and non-thesis) 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, 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 specialties and the development of new areas of biological and related sciences, the Department of Biology will assist those students who wish to include interdisciplinary objectives in their Masters or Ph.D. programs.

To be admitted for an advanced degree in biology, the applicant must meet the requirements for admission to the Graduate School, must present an acceptable undergraduate major or sufficient background and meet the minimum grade point average and GRE General Examination scores required by the Department.

Applications for admission and additional information may be requested from the Office of Admissions the Director of Graduate Studies of the Department of Biology or accessed a the Department webpage. The general requirements for the master's and doctoral degrees are stated 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.

A cooperative Ph.D. program is sponsored jointly by the Departments of Biology at Murray State University and the University of Louisville. Inquiries concerning the program should be addressed to the Chair of the Department of Biology either at the University of Louisville, or at Murray State University (Murray, Kentucky 42071). 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 four categories*

	Semester Hours	Total
Environmental Physiology	4	
Molecular Approaches in Environmental Biology	4	
Evolution or Systematics	4	
Population, Community, or Ecosystem Ecology	4	16
Other Courses		
Statistics	4	
Advanced Environmental Courses	20	
Dissertation Research	9	
Minimum Total**		**49**

* 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 Department of Biology offers Master's degrees with programs of study tailored to the needs and interests of a diverse student population. Students may enroll on a full or part-time basis. A Master's degree in Biology prepares a student for further graduate study (Ph.D. or M.D. programs) or careers in teaching, research, business or government. Students have up to six years to complete the Master's degree. The Department of Biology offers both thesis and non-thesis options.

The thesis option is generally chosen by students with career goals which include a research emphasis. Student choosing this option take course work and carry out an intensive independent research project under the supervision of a member of the Graduate Faculty, culminating in a written thesis based upon the research project. The non-thesis option usually chosen by those who wish to advance their knowledge of Biology but are not sure of a specific career goal or do not anticipate a research emphasis in their future.

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

	Thesis	Non-Thesis
Cellular/Physiology	3-4	3-4
Subcellular/Genetics	3-4	3-4
Evolution or Systematics	3-4	3-4
Population, Community, or Ecosystem Ecology	3-4	3-4
Total	**6-8**	**9-12**

Other courses

Statistics (Biology 650)	4	4
Electives	11-14	13-17
Thesis Research (600 level)	6	0
Research Experience (Biology 516, 608, 664 or 691)	0	3-4
Minimum Total	**30**	**33**

Note:
A minimum of 12 (thesis option) or 17 (non-thesis option) semester 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 (BA)

http://cbpa.louisville.edu

Graduate Program Faculty

Professors
Arthur J. Adams
Sidney J. Baxendale
Betty C. Brown, Associate Dean
Paul A. Coomes
Richard E. Coppage
Bryan L. Dos Santos
Kathleen Drummond, Emerita
James O. Fiet
Stephen F. Gohmann
Hazel J. Johnson
Frank E. Kuzmits
Raymond W. LaForge
James O. Fiet
Alan Levitan
Subash C. Lonial
Peter B. Meyer
Babu Nahata
John P. Nelson
J. Russell Ray
Harold V. Savitch
S. Srinivasan
Lyle Sussman
Robert L. Taylor, Dean, College of Business & Public Administration
Randall L. Wells

Associate Professors
Alan N. Attaway
Jay T. Brandi
Reginald A. Bruce
Nan-Ting Chou
Van G. H. Clouse
Audrey Davidson
Carrie G. Donald
Archie W. Faircloth
Benjamin P. Foster
John I. Gilderbloom
Jian Guan
Mahesh C. Gupta
Terence M. Hancock
Scott D. Johnson
Julia S. Karcher
Bruce H. Kemelgor
Steven G. Koven
Thomas S. Lyons
James R. McCabe
Robert C. Myers
Diana C. Preece
P. S. Raju
Frederick W. Siegel
John Vahaly, Jr.
Richard M. Walter
Joseph M. Zurada

Assistant Professor
Karen Bishop
Lynn H. Boyd
David Simpson
Andrew L. Wright

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 program objective is to help its student develop the advanced business and entrepreneurial skills they need to be successful in the global market place. The University of Louisville's MBA program is accredited by the American Assembly of Collegiate Schools of Business (AACSB), the International Association of Management Education (IAME) in addition to the University's regional accreditation of the Southern Association of College and Schools (SACS).

The MBA degree program is available to qualified individuals possessing a bachelors degree from a regionally accredited college or university. No specific undergraduate major is required. Applicants with undergraduate degrees in Business Administration need 36 hours of 600-level MBA courses to fulfill the degree requirements. Applicants whose undergraduate curriculum did not include courses in Business Administration must successfully complete a set of 500-level foundations courses, normally 12 hours, or equivalent undergraduate courses, normally 18 hours, before enrolling in the 36 hour MBA curriculum.

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 three successive terms, a three week term with classes meeting 5 nights a week, followed by a five week term with classes meeting three nights a week. Occasionally classes may be offered that span two terms or meet during the day.

All core 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 summer session.

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 listed below: You may apply on-line at http://cbpa.louisville.edu/.

- Submit a completed graduate application (on-line at www.graduate.louisville.edu) to the University of Louisville Admissions Office with a $25 application fee. Program candidates are admitted in the Fall (August), Spring (January) and Summer (May) sessions. Priority deadline for submitting applications and all application materials is May 1 for Fall, October 1 for Spring, and February 1 for Summer.
- Official transcripts verifying the receipt of a baccalaureate degree from a regionally accredited institution must be submitted to the Admissions Office by the application deadline.
- The Graduate Management Admissions Test (GMAT) is required. It is designed to measure general aptitude for graduate study in business administration. It does not test knowledge in specific business subjects. An admission decision will not be made without the GMAT results. See web www.gmac.com or call 1-800-GMAT-NOW.
- A current resume is required.
- A one page written personal statement is required. The statement should demonstrate the applicant's motivation and desire to earn an advanced degree. Professional achievements, community involvement, etc. may be noted here.
- Two letters of recommendation 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 do not score at least 213 on the TOEFL may choose to apply to the Intensive English as a Second Language Program (IESL). 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 (IESL) 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:

- A 3.0 grade point average must be maintained or the student will be placed on probation for two semesters. If the 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. After dismissal, the student may submit a written petition to the MBA Counselor requesting re-admission.
- A faculty member teaching a graduate level course may assign a grade with either a plus (e.g., B+) or a minus (e.g., B-). See the section on Academic Policies and Requirements for the point value of plus and minus grades.
- Grades of "A", "B", or "C" are the only grades considered as passing. However, a "D" or an "F" will be used in calculating the grade point average.
- A maximum of six hours with 600-level courses with a grade of "C" may count toward the completion of degree requirements.
- A 3.0 grade point average must be maintained in the program. 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 college academic officer.
- Students are restricted to no more than one independent study from any single faculty member in the degree program. It is possible to earn a maximum of 3 credit hours of independent study per semester and maximum of six hours in the program.
- 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.

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 and Computer Skills Requirements

MBA candidates are expected to be academically proficient in quantitative skills on entry to the MBA core curriculum. Prior academic work may be used as evidence of proficiency. Proficiency must be attained before enrolling in any MBA core courses. The skills consist of:

- **Computer literacy:** student must have access to a computer and validate literacy in business software (Word Processing, Spreadsheets, data base analysis), web access and e-mail. The University offers free e-mail and web accounts at a modest cost. Students lacking skills in business software can take CIS 100 to gain familiarity with the software.
- **Mathematics:** Three or more semester credit hours of prior undergraduate course work in mathematics comparable to MATH 111, College Algebra, passed with a grade of "C" or higher. Students lacking prior course work can take MATH 111 to satisfy the requirement.

Curriculum Requirements

The following curriculum requirements apply to all MBA degree students:

- Students must complete all prerequisite courses before enrolling in MBA level courses. Failure to do so puts the student at risk for unsatisfactory performance. A written petition for an exception to this requirement must be submitted to the MBA advisor.
- A 500-level business course cannot be used as an elective.
- For students seeking an MBA concentration, the twelve hours of electives are specified. All the concentrations are cross-disciplinary in nature. Concentrations currently available are: Healthcare Administration, Communications, International Business, Electronic Commerce, and Entreprenuership.
- Students not seeking a concentration satisfy the Breadth requirement across disciplines by taking no more than six of the twelve hours of electives in any one discipline (marketing, management, finance, accounting, economics, and computer and information systems). For the purpose of classifying electives, MGMT 645, 684, 685, 686, and 687 are considered entrepreneurship rather than the MGMT electives. Students who wish to enroll in additional elective courses in a discipline beyond the 6 hours limitation are welcome to do so; however, doing so will require more hours than the minimum 36 hours of MBA post-foundations coursework to earn their degree.
- Students must make steady and satisfactory progress toward their degree. Students who fail to maintain enrollment for a period of more than 24 months will be administratively withdrawn from the program.
- Students who seek to return after such a period of non-enrollment are required to apply for admission to the MBA program.

Transfer Credit

A student may be allowed to transfer up to six semester hours of graduate business academic credit from another regional accredited institution(s) that offers advanced degrees. An additional six semester hours of graduate business credit may be transferred from an AACSB accredited MBA program 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. Students wishing to transfer credit should make a request to the MBA Counselor. Final approval for the transfer of credit must come from the Graduate School.

Honors

Students who complete the MBA program with a grade-point average of 3.75 or higher will be graduated "With Distinction." Any graduate with a 4.0 standing will also be nominated for the Phi Kappa Phi Honorary Society.

Master of Business Administration

Major: BA
Degree: MBA
Unit: GB

Degree Requirements

Candidates for the MBA degree must:

- Earn a minimum of 24 of the 36 hours of post- foundations graduate credit in residence at the University of Louisville.
- Complete degree course requirements within six years of the semester admitted to the MBA program.
- Earn a minimum of 3.0 grade point average.

Foundations

The undergraduate and 500-level courses provide students with the academic common body of knowledge necessary for undertaking the MBA core requirements. The 500-level courses are restricted to students who have been admitted to the Graduate School.

Upon admission to the MBA program, the student must demonstrate proficiency in the business foundation courses. They may do this by submitting evidence of equivalent undergraduate courses with a minimum grade of "C", completing 500-level courses or the specified undergraduate courses or passing a proficiency exam.

	Semester Hours
Acct 500, Fundamentals of Accounting	
or 6 hours of Principles of Accounting ACCT 201-202	1.5
ECON 500, Economics	
or 6 hours of Micro and Macro Economics ECON 201-202	3.0
FIN 500, Business Finance	
or 3 hours of Corporate Finance (FIN 301)	3.0
MGMT 501, Managerial Statistics	
or 3 hours of Statistics, e.g., MGMT 201	3.0
MKT 500, Marketing Concepts	
or 3 hours of Principles of Marketing MKT 301	1.5

Additionally, it is assumed that the students have completed a minimum of 3 hours of mathematics at the level of MATH 111, College Algebra or higher and is proficient in the use of e-mail, web access, word processing, and spreadsheet software. Students not meeting these requirements must complete MATH 111 and/or CIS 100 or equivalent courses.

The MBA Core Curriculum

The MBA Core is structured into four sequential phases. The courses in each phase have as prerequisites the courses in the prior phases. Strict compliance with the prerequisites is necessary to insure satisfactory performance in the MBA core.

I. Managing in the New Economy

This initial sequence introduces students to the critical skills in a dynamic global environment where information and technology are continually changing the way organizations do business. While the focus is on the "New Economy", there are basic theories and constructs of education that stand the test of time. Core units of study include:

- ECON 600 Managerial Economics
- CIS 675 Managing Information Technology
- MGMT 600 Advanced Organization Behavior

II. Managing the Value Chain

In all economies, organizations produce, market, and deliver goods and services to customers. This must be done in a way that is competitive and profitable. This phase focuses on the identification and measurement of value in production and distribution. Core units of study include:

- ACCT 600 Managerial Accounting
- MGMT 610 Operations Management
- MKT 600 Marketing Management

III. Managing Opportunity, Risk, and Reward

Organizations must invest in new assets and processes to sustain the continuous improvement and discontinuous innovation necessary to compete in today's changing product markets. With competitive pressures to reduce costs, investing to transform the firm and failing to invest each involve risks. The focus here is on value creation, tools for measuring it, opportunity recognition and analysis, risk management and decision making to enhance firm value. The core unit of study is:

- FIN 600, Financial Management

IV. Understanding the Global Market

The integrating unit for the MBA core brings together elements from all the aforementioned phases, adding a strategic perspective that transcends geographical boundaries. Here, the focus is on comprehensive case analysis incorporating prior work with a unifying theme. The core unit of study is:

- MGMT 690, Corporate Entrpreneurship and Global Strategy

The Specialized Curriculum

A minimum of 12 hours of elective coursework beyond the core curriculum completes the MBA program. Normally these are taken as two courses in each of the third and fourth phases of the program; however, students may choose to take electives earlier in their program if they have the appropriate prerequisites.

No more than six hours of elective courses in a single discipline may be counted toward these twelve hours in order to provide breadth to the student's MBA studies. However, students may instead select a concentration offered in the MBA program. Courses in the concentrations typically encompass elements from two or more business disciplines and thus meet the MBA breadth objective. Concentrations available include entrepreneurship, communications, healthcare administration, electronic commerce and international business.

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.

MD/MBA Program

The MD/MBA program is offered jointly by the College of Business and Public Administration and the School of Medicine. The purpose of the program is to combine the two-year Master of Business Administration and the four-year Doctor of Medicine degrees into a single program over five calendar years. The program is open to entering medical students in the School of Medicine. Students in the joint program begin taking MBA classes the summer before their medical studies begin. The normal first year of medical studies is divided into two years. Students take medical classes during the day and business classes in the evening. Students finish up their business studies during the summers after the first two years of medical school. At the end of two years, students normally will have finished the MBA requirement. For the next three years students will complete the remaining three years of their medical school studies for the MD. Students have the option of taking the traditional MBA program or the integrative MBA program for their business studies.

While enrolled in the College of Business and Public Administration, MD/MBA students are subject to all the 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 sequence together.

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 MEng/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 Athens, Panama City, 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 (CHE)

www.louisville.edu/speed/chemical

Graduate Program Faculty

Chair
Thomas L. Starr, Professor

Professors
Dermot J. Collins
Pradeep B. Deshpande
Thomas R. Hanley, Dean, Speed Scientific School
Dean O. Harper, Graduate Student Advisor
Walden L. S. Laukhuf
Raul Miranda, Graduate Student Advisor
Patricia A. Ralston
James C. Watters, Undergraduate Student Advisor

Associate Professors
Kyung A. Kang

Assistant Professor
Mahendra Sunkara

Associates
Lawrence Gettleman
Elias Klein
Richard A. Ward

Emeritus/Emerita
Marvin Fleischman
Earl R. Gerhard, Dean, Emeritus
Charles A. Plank
Hugh T. Spencer
Gordon C. Williams

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 with a cooperative education component 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 undergraduate GPA 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	2	2
Other 500-600 level courses (at least one course outside chemical engineering)	12	12
CHE 690, M.S. Thesis in Chemical Engineering	6	6
Minimum Total		**32**

Master of Engineering in Chemical Engineering

Major: CHE
Degree: MEN
Unit: SS

Higher Studies Divison[1]

	Semester Hours Total
CHE 562, 595, 610, 620, 641, 686, xxx[2], xxx[2], xxx[2], xxx[2,3]	26
Thesis Alternative — CHE 697*	
OR	
Course Work and Project Alternative - CHE 698, 699	6
Minimum Total	**32****

[1] A student entering the Division of Higher Studies will be required to select either the thesis alternative path or the course work and project alternative path for the degree program.

[2] A student specializing in CHE is required to select four approved electives (500 or 600 level) totaling at least twelve (12) semester hours. By proper choice of these electives, a student may develop specific strengths in areas such as computer aided engineering, catalysis and chemical reactions, process simulation and design, polymer processing, materials, process control, thermodynamics, mass transfer and separations, pollution prevention, or bioengineering. However, depending on faculty availability and other departmental needs, sufficient courses may not be offered in any one or two year period to allow a student to specialize in some of these areas. These electives need not necessarily be Chemical Engineering courses, but the student's research advisor and academic advisor must approve non-Chemical Engineering courses.

[3] To insure that all students have a sufficient engineering design component in their program of study, these electives must be taken in a manner to obtain at least three (3) credit hours of design.

* A regularly enrolled student selecting the thesis alternative is required to select both an approved M.Eng. thesis topic and the members of the thesis committee during the first term of the graduate/professional year. Six (6) semester hours of CHE 697 are required to satisfy the minimum M. Eng. thesis requirements.

**The five-year total for the M.Eng. degree is 169 semester hours.

Chemistry (CHEM)

www.louisville.edu/a-s/chemistry

Graduate Program Faculty

Chair
George R. Pack, Professor

Professors
Richard P. Baldwin
Robert M. Buchanan
Donald B. DuPré
Dorothy H. Gibson
Mark E. Noble
Arno F. Spatola
K. Grant Taylor
Charles A. Trapp
Richard J. Wittebort
John L. Wong
M. Cecilia Yappert

Associate Professors
Frederick Luzzio
John F. Richardson

Assistant Professors
Craig A. Grapperhaus
Pawel M. Kozlowski
Muriel C. Maurer

Emeritus/Emerita
John W. Brown
Thomas H. Crawford
N. Thornton Lipscomb
Gradus L. Shoemaker
Donald E. Williams

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, biomolecular structure and engineering, 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. A 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 four (4) advanced (core) 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 area selected for research 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 TOEFL or Michigan test).
4. Satisfactory performance on a written comprehensive exam based upon an original research proposal and 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. The literature seminar must be presented no later than the fifth semester of graduate studies and is based on a topic of current chemical interest. The research seminar is based on the results of student's research and must be presented about a year prior to the final defense of the degree.

Master of Science in Chemistry

Major: CHEM
Degree: MS
Unit: GA

Degree Requirements

The general requirements for the 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 Dean of the Graduate School. 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 TOEFL or Michigan test).
4. Acceptable presentation of a one-hour literature seminar on a topic of current chemical interest. This seminar must be presented no later than the fifth semester of graduate studies.

Civil and Environmental Engineering (CEE)

www.louisville.edu/speed/civil

Graduate Program Faculty

Chair
Louis F. Cohn, Professor

Professors
N. R. Bhaskar
Michael A. Cassaro
Mark French
D. Joseph Hagerty
R. A. Harris
Thomas Holloman
C. Eugene Miller, Emeritus
Arthur C. Parola
Mario Paz
Charles R. Ullrich

Associate Professors
Jafar P. Mohsen
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 programs of study leading to the degrees of Master of Science and Doctor of Philosophy in Civil Engineering. 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. and Ph.D. programs 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 general requirements for the Doctor of Philosophy program are the same as those of the Graduate School. Other specific requirements for the PhD in Civil Engineering are:

	Semester Hours	Total
CEE 699, CE PhD Research	18	
CEE 698, CE PhD Seminar	3	
In-Discipline Program Courses and Electives*	27	
Total		**48**

*May include up to 6 hours credit in approved mathematics

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.

Master of Engineering in Civil Engineering

Major: CE
Degree: MEN
Unit: SS

Higher Studies Division

CEE 680, 697[1] (9)

In addition, at least 21 semester hours of course work must be completed in one of the following speicaity areas:[2]

Facilities Engineering (including courses in geotechnical/structural)
CEE 520, 522, 550, 552, 604, 620, 621, 625, 652, 653, 654 (21 hours)

P**ublic Works Engineering** (includes courses in geotechnical/transportation/ water resources)
CEE 550, 552, 560, 570, 571, 572, 604, 652, 653, 654, 660, 662, 665, 670, 673, 674 (21 hours)

At the discretion of the student's advisor, the following Environmental courses may be selected to fulfill program elective requirements for either Facilities Engineering or Public Works Engineering.
CEE 509, 534, 535, 561, 573, 675, 694

Minimum Total ..... 30[3]

Notes:
[1] A regularly enrolled full-time student is required to select an approved M.Eng. thesis topic and the members of the thesis committee during the first term of the graduate/professional year.
[2] Both specialty areas meet the engineering topics criteria of the EAC/ABET.
[3] The five-year total for the M.Eng. degree is 162 semester hours.

Certificate in Environmental Engineering

Major: CECS, CEE, CHE, ECE, IE, ME
Certificate: CENV
Unit: GS

Certificate Program only. Not a degree program. Awarded only with completion of a graduate degree program (M. Eng., M.S., Ph.D.) at Speed Scientific School.

Admission Requirements:

1. Admission to the Speed Scientific School Division of Higher Studies (M.Eng.) or the Graduate School (M.S. or Ph.D) in Engineering.
2. Approval of an Application for the Environmental Engineering Certificate Program

	Semester Hours	Total
Environmental Engineering Electives (500-level)	0-6	
Environmental Engineering Electives (600-level)	6-12	12

Courses are to be selected from the following:

- CEE 509 Environmental Process Systems
- CEE 534 Industrial Waste Management
- CEE 535 Solid Waste Management
- CEE 561 Environmental Analysis of Transportation Systems I
- CEE 570 Applied Hydraulics
- CEE 571 Applied Hydrology
- CEE 572 Open Channel Hydraulics
- CEE 573 Groundwater Hydrology
- CEE 670 Advanced Hydraulics
- CEE 673 Advanced Hydrology
- CEE 674 Water Resource Systems
- CEE 675 Surface Water Quality
- CHE 509 Environmental Process Systems
- CHE 620 Transport Phenomena I
- CHE 637 Advanced Stagewise Processes
- CHE 638 Advanced Absorption
- CHE 650 Membrane Separations
- CHE 662 Advanced Process Control
- CHE 533 Chemical Engineering Safety and Health
- CHE 534 Industrial Waste Management
- CHE 535 Pollution Prevention (Waste Reduction Treatment and Disposal)
- CHE 572 Plant Process and Project Design
- ME 580 Air Pollution Control
- CHEM 622 Analytical Separations
- BIOL 521 Stream Ecology
- BIOL 522 Aquatic Ecology
- BIOL 568 Conservation Biology
- BIOL 662 Ecosystems Ecology

Note:
Graduate courses not shown in the list above require approval from the Certficate Program Director.

Certificate courses do not constitute a degree program, but may be applied toward M.Eng., M.S., or Ph.D. degree requirements.

Other requirements:
Completion of graduate degree program at Speed Scientific School (M.Eng., M.S., or Ph.D.).

Classical and Modern Languages (CML)

www.louisville.edu/a-s/cml/

Graduate Program Faculty

Chair
Wendy E. Pfeffer, Professor

Professors
Roy L. Ackerman
Howard B. Altman
Rhonda Buchanan
William L. Cunningham
Alan C. Leidner
Frank Nuessel
Sydney P. Schultze

Associate Professors
Anne Greenfeld
Mary Makris
Manuel Medina

Emeritus/Emerita
Fortuna Gordon
David R. Hershberg
Hubert Papailler
Hans Petersen
Marilyn V. Schuler
David R. Hume

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 or Spanish. 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.

Master of Arts in French or Spanish

Major: FREN, SPAN
Degree: MA
Unit: GA

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. Six of the hours may be fulfilled by the writing of a thesis written 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 (COMM)

http://comm.louisville.edu/

Graduate Program Faculty

Chair
Charles A. Willard, Professor

Professors
John P. Ferré

Associate Professors
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 (CD)

www.louisville.edu/medschool/surgery/com-disorders

Graduate Program 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. 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 a clinical site outside the Louisville area.

Certain prerequisites and standards apply to this 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) 852-5274. www.graduate.louisville.edu.

Computer Engineering and Computer Science (CECS)

www.louisville.edu/speed/cecs

Graduate Program Faculty

Chair
Adel S. Elmaghraby, Professor

Professors
James H. Graham, Endowed Henry Vogt Chair
Khaled A. Kamel
Melvin J. Maron
Rammohan K. Ragade, Associate Chair of Graduate Studies
Arthur M. Riehl, Emeritus

Associate Professors
Dar-Jen Chang
Ahmed H. Desoky
Ibrahim Imam
Anup Kumar
Donald F. Linton, Emeritus
Gwong C. Sun, Graduate Advisor

Assistant Professor
Antonio Badia

Visiting Professors
Mehmed Kantardzic
Mariofanna Milanova

Adjunct Professor
Ronald L. Moore, VP for Information Technology

Adjunt Associate Professor
Akram Ibrahim Salah

Adjunct Assistant Professors
Sherrrif El-Kassas
David D. King
Michael M. Losavio
Tarek Mohamed
Kamel Mahmoud
Khaled Wahba

Associate
S. Srinivasan

Programs

The Department of Computer Engineering and Computer Science of the Speed Scientific School, the school of engineering at 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 and Computer 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 Computer Engineering and Computer Science. The first four (4) years are described in the University's Undergraduate Catalog.

Admission Requirements

Please check application deadlines for prospective semesters.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 catalog.

Master of Science in Computer Science

Major: CS
Degree: MS
Unit: GS

This program is available for interested individuals who have an adequate background, but do not necessarily have a baccalaureate degree in engineering. This program is governed by the general regulations of the University of Louisville Graduate School and is accredited by the Southern Associations of Colleges and Schools. Interested students should refer to the Graduate School Catalog or to the Department Office for further information about the Master of Science Program.

Prerequisites: (not included in degree program)

1. A bachelor's degree.
2. Successful completion of CECS 121, 230, 302, 303, 310, 325, 335, 420, and 440 or their equivalents and IE 360.

	Semester Hours	Total
Required Courses		
CECS 504, Automata Theory		
or CECS 530, Design of Compilers	3	
CECS 550, Software Engineering		
or CECS 630, Data Base Design	3	
CECS 619, Design and Analysis of Computer Algorithms		
or CECS 545, Artificial Intelligence	3	
CECS 622, Simulation & Modeling of Discrete Systems		
or CECS 522, Performance Evaluation of Computer Systems	3	
CECS 516, Fundamentals of Computer Communications and Networks		
or CECS 629, Distributed System Design	3	
CECS 563 Experimental Design in Engineering	3	
CECS 690, M.S. Thesis in Computer Science		
or 2 CECS 600-level graduate courses for non-thesis options*	6	24
Elective Courses		
Computer Science	3	
Technical electives		
(may be from areas other than computer science)	3	6
Minimum Total		**30**

NOTES:

A minimum of 15 semester hours (including computer science thesis credit) must be in courses numbered 600 or above.

Electives require approval of student's graduate committee or graduate program advisor.

Languages such as C, C++, and JAVA might be needed. These are offered at the undergraduate level; not for graduate credit.

* Two CECS 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.

Master of Engineering in Computer Engineering and Computer Science

Major: CS
Degree: MS
Unit: GS

On entering the Professional School, the student chooses an area of concentration for the master's thesis and selects a sequence of program elective courses for the thesis concentration (see list of courses at the end of the program). The Master of Engineering degree is accredited by EAC/ABET under the criteria for Computer Engineering. Students with ABET accredited Bachelors degrees in Engineering will also be considered for this degree.

	Semester Hours	Total
Higher Studies Division ([1,3])		
CECS 502, 510, 530	7	
CECS 619, 622, 630, 697[3]	17	
Approved CECS Electives ([2,4])	6	
CECS 511	1	
Minimum Total		**31***

[1] CECS students are required to take the "C++" and "JAVA" programming language course. "C++" and "JAVA" programming is used in several CECS courses.

[2] CECS elective may be chosen from the following approved list: CECS 522, 530, 542, 545, and 546[3]

[3] A full-time student is required to have selected both an approved M.Eng. thesis topic and the director of the thesis committee during the first term of the graduate/professional year.

[4] Required CECS program elective courses may be chosen from CECS 600-level courses to provide concentration at the Master of Engineering level in the areas of research focus in the department. Lists of appropriate engineering design courses and engineering science courses are available in the CECS Department.

* The five-year total for the M.Eng degree is 164 semester hours.

Computer Science and Engineering

The Computer Engineering and Computer Science Department (CECS) and the Electrical and Computer Engineering Department (ECE) jointly offer the Ph.D. degree in Computer Science and Engineering (CSE) through the Graduate School. Students interested in the Ph.D. program should consult the Graduate School Catalog entry on Computer Science and Engineering Ph.D. program or contact Ms. Gina Payne-Yunker, Computer Science and Engineering Program Secretary (J.B. Speed Hall, Rm 124; glpayn01@gwise.louisville.edu or Dr. Rammohan Ragade: rkraga01@gwise.louisville.edu).

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.

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 ECE 516/CECS 525.

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

Advanced Mathematics core courses include: CECS 508, 563, 615,; MATH 501, 511, 581, 660, 662, 681.

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.

CSE Program Faculty

Coordinator
Rammohan K. Ragade, Professor (CECS)

Professors
Peter B. Aronhime (ECE)
Kiron C. Bordoloi (ECE)
Darrel L. Chenoweth (ECE/CECS)
Thomas G. Cleaver (ECE)
Robert W. Cohn (ECE)
Joseph D. Cole (ECE)
Adel S. Elmaghraby (CECS)
Aly A. Farag (ECE)
James H. Graham (CECS/ECE)
J. Carroll Hill (ECE)
Barry R. Horowitz (ECE)
Khaled A. Kamel (CECS)
Melvin J. Maron (CECS)
Patricia A. S. Ralston (CHE)
Donald J. Scheer (ECE)
Jacek M. Zurada (ECE)

Associate Professors
Dar-jen Chang (CECS)
Hollace L. Cox (ECE)
Ahmed H. Desoky (CECS)
Anup Kumar (CECS)
John H. Lilly (ECE)
Gwong-Chain Sun (CECS)
Kevin M. Walsh (ECE)

Emeritus/Emerita
Samuel V. Bell (ECE)
Arthur M. Riehl (CECS)

Educational and Counseling Psychology (ECPY)

www.louisville.edu/edu/ecpy

Graduate Program Faculty

Chair
Daya S. Sandhu, Professor

Professors
George K. Cunningham
Nancy J. Cunningham
John M. Dillard
Pedro R. Portes
Gerald B. Sklare

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

Assistant Professors
Steven J. Morris

Emeritus/Emerita
Rea T. Alsup
William F. Kelly
Eleanor Y. Love

Program
Degrees offered by the Department of Educational and Counseling Psychology include the Doctor of 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 a scientist-practitioner model in which practice is grounded in the science of psychology and critical inquiry. The curriculum of this program includes coursework in four broad areas: 1) science of psychology; 2) research and statistics; 3) counseling psychology and 4) electives in counseling and psychotherapy. Students are expected to demonstrate knowledge of theory, research, and practice in counseling psychology through a series of comprehensive examinations and to demonstrate competency in clinical 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.

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 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	3
Professional Area		
ECPY 600, Introduction to Counseling and Psychotherapy	3	
ECPY 540, Evaluation and Measurement in Education	3	
ECPY 670, Career Development and 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 Issues	3	
ECPY 680, Practicum in Counseling	3	
Practicum or Internship	3	
ECPY 726, Consultation	3	
ECPY 605, Human Development	3	
ECPY 730, Social, Legal, and Ethical Issues in Counseling	3	
Related Elective	3	
Elective or Thesis	3	45
Minimum Total		**48**

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		
EDFD 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 and Techniques of Counseling and Psychotherapy	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 650, Group Process and Practice	3	
ECPY 663, Multicultural Issues	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 and Psychotherapy	3	
ECPY 621, Differential Diagnosis and Treatment in Counseling	3	
ECPY 730, Social, Ethical and Legal Issues in Counseling	3	
ECPY 671, Psychology of Career Development	3	
ECPY 663, Multicultural Issues	3	
ECPY 648, Psychological Assessment I	3	
ECPY 649, Psychological Assessment II	3	
ECPY 775, Biological Basis of Behavior	3	
ECPY 605, Human Development or ECPY 631, Adolescence or ECPY 705, Adult 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	3	
ECPY 650, Group Process and Practice	3	
ECPY 696, Independent Study and Guidance	3	
ECPY 697, Topical Seminar	3	
Minimum Total		**55**

Master of Education in Counseling and Personnel Services with concentration in Elementary School Counseling

Major: CPS
Concentration: ELCT
Degree: MED
Unit: GE

Prerequisite: A Bachelors degree from an accredited college and teachers certification in Early Elementary or Middle School Education; ECPY 540 Evaluation and Measurement

Rank II and Elementary School Counseling Certification Requirements (36 hours)

	Semester Hours	Total
Graduate Core		
EDFD 600, Introduction to Research Methods and Statistics	3	3
Professional Courses		
ECPY 600, Introduction to Counseling and Psychotherapy	3	
ECPY 625, Elementary School Counseling	3	
ECPY 651, Group Procedures with Children	3	
ECPY 663, Multicultural Issues	3	
ECPY 605, Human Development	3	
ECPY 626, Consultation	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 670, Career Development and Counseling	3	15
ECPY 628, Theories and Techniques of Counseling Children	3	
ECPY 680, Counseling Practicum	3	
Minimum Total		**36**

Master of Education in Counseling and Personnel Services with concentration in Secondary School Counseling

Major: CPS
Concentration: SECT
Degree: MED
Unit: GE

Prerequisite: A Bachelors degree from an accredited college and teachers certification in Middle School Education and Secondary Education; ECPY 540 Evaluation and Measurement

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

	Semester Hours	Total
Graduate Core		
EDFD 600, Introduction to Research Methods and Statistics	3	
Area of Concentration		
ECPY 600, Introduction to Counseling and Psychotherapy	3	
ECPY 624, Organization and Administration of Secondary School Counseling	3	
ECPY 650, Group Process and Practice	3	
ECPY 663, Multicultural Issues	3	
ECPY 631, Adolescence	3	
ECPY 626, Consultation	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 670, Career Development and Counseling	3	
ECPY 629, Theories and Techniques of Counseling and Psychotherapy	3	
ECPY 680, Counseling Practicum	3	
Minimum Total		**36**

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	
Professional Area Requirements		
ECPY 540, Evaluation and Measurement in Education	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 Issues	3	
ECPY 664, College Student Sub-Cultures	3	
ECPY 681, Internship in College Student Personnel Services	3	
ECPY 721 Capstone Seminar	3	
ECPY 761, Program Development and Evaluation in Student Affairs	3	
EDAD 682, Organization & Administration of Higher Education	3	36
Professional Electives		
(Two courses from the following list:)		
ECPY 540, Evaluation and Measurement in Education	3	
ECPY 619, Theories of Counseling and Psychotherapy	3	
ECPY 640, Assessment Methods for Counselors	3	
ECPY 670, Career Counseling	3	
ECPY 699, Thesis or Professional Paper	3-5	
ECPY 605, Human Development ***or*** ECPY 631, Adolescence	3	
ECPY 705, Adult Development Theories	3	
ECPY 730, Social, Legal, and Ethical Issues in Counseling	3	
EDAD 607, Principles of Educational Leadership	3	
EDAD 680, Legal Issues in Post-secondary Education	3	
EDAD 684, Educational Research Management in Post-Secondary Education	3	
EDAD 686, The Two-Year College	3	
EDAD 730, Diversity in Educational Leadership	3	6-8
EDFD 680, The American College and University	3	
EDFD 681, The Philosophy of Higher Education	3	
Minimum Total		**48-50**

Rank I Program for Certified School Counselors

Major: CPS
Concentration: ELCT or SECT
Unit: GE

Prerequisites: Master's degree in Elementary or Secondary School Guidance or Rank II Equivalency

	Semester Hours	Total
General Requirements		
ECPY 663, Multicultural Issues	3	
ECPY 684, Internship in School Counseling	3	
ECPY 722, Adv Theories of Counseling Psychotherapy	3	
ECPY 730, Social, Legal and Ethical Issues in Counseling	3	
ECPY 750, Group Counseling, Advanced Theory and Practice	3	
One course in curriculum at the appropriate school level:		
Elementary: EDEM 602, Middle: EDEM 607; Secondary: EDSD 654	3	
Electives to complete Rank I program		
Exit Requirement: Successful completion of a portfolio		
Minimum Total		**60**

Note:

1. Of the total Rank I program, at least 15 semester hours beyond the Rank II shall be taken at the University of Louisville. The remaining credit hours may be taken at the same institution or, upon approval of the faculty advisor, at other institutions. There is no stipulation as to recency of completion of Rank I credit.
2. Transfer credit must be accepted by the advisor - final acceptance is dependent upon receipt of official transcripts.
3. An academic average of "B" shall be required on the course hours submitted for Rank I, and no credit shall be accepted for a course carrying a grade lower than "C".

Expressive Therapies Program (ET)

www.louisville.edu/edu/et

Graduate Program Faculty

Associate Professor
Abby C. Calisch

Assistant Professors
Claudia Ronaldson, Acting Director

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 inoculations 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. Undergraduate 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. Priority application deadline is January 15th. Applications are processed in the order they are received and will be accepted throughout the year. 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.

Master of Arts in Art Therapy

Major: ARTT
Degree: MA
Unit: GE

	Semester Hours	Total
Required Courses		
ET 601, Clinical Art Therapy I: Theories	3	
ET 604, Clinical Art Therapy II: Assessment	3	
ET 611, Applied Methods	2	
ET 617, Field Studies I	2	
ET 618, Field Studies II	2	
ET 621, Topical Seminar in Research	3	
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	35
Elective Courses		
Minimum of 10 hours selected, with approval of advisor from department, to include areas such as expressive therapies, psychology, social work, education, research; medicine, and independent study	10	10
Minimum Total		**45**

Electrical and Computer Engineering (ECE)

www.louisville.edu/speed/electric

Graduate Program 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
Aly A. Farag
J. Carroll Hill
Barry R. Horowitz
Leo B. Jenkins, Jr., Emeritus
Donald J. Scheer
Jacek M. Zurada

Associate Professors
Bruce Alphenear
Hollace L. Cox
John H. Lilly
Kevin M. Walsh

Assistant Professor
John N. Naber

Programs

The Department of Electrical and Computer 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. In addition, it participates in the interdisciplinary master's programs.

The Department of Electrical and Computer Engineering offers a Ph.D. degree in Electrical Engineering and, also participates in the Ph.D. program in Computer Science and Engineering, offered jointly with the Computer Engineering and Computer Science Department.

Admission Requirements

Applicants for admission to the graduate (M.S.) program in Electrical and Computer Engineering should have a baccalaureate degree in Electrical Engineering or in a closely related area from an accredited institution with a GPA of 2.75/4.0 or better. Students whose baccalaureate degree is not in Electrical Engineering but is in a closely related area may be required to take pre-requisite undergraduate courses in ECE. 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 in consultation with the permanent advisor selects the remaining members of the thesis committee. The committee consists of the permanent advisor and at least two other graduate faculty members, one of whom must be from outside the Electrical and Computer Engineering Department.

Master of Science in Electrical Engineering

Major: EE
Degree: MS
Unit: GS

	Semesters Hours	Total
Electrical and Computer 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 and Computer 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**

Master of Engineering and Electrical Engineering

Major: EE
Degree: MEN
Unit: SS

The mission of the electrical engineering program is to educate students in a professional school context, with the students completing a five-year program including cooperative education assignments and a major design experience.

Higher Studies Division

ECE 500-level Program Electives[2] (9)
ECE 600-level Program Electives[2] (9)
XX 500-level Technical Elective[3] (3)
XX 600-level Technical Elective[3] (3)
ECE 697 or ECE 698* (thesis or paper alternative)

Minimum Total.....32**

[1] A total of nine semester hours of design electives is required in the Higher Studies Division. A list of approved Design Electives is available in the Department.
[2] Courses selected to meet the 500 and 600 level Program Electives require the approval of the student's thesis director.
[3] Courses selected to meet the 500 and 600 level Technical Electives require the approval of the student's thesis director.

* The requirement for the major design experience, as specified by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET), may be satisfied by either ECE 697 Master of Engineering Thesis in Electrical Engineering or ECE 698 Master of Engineering Paper in Electrical Engineering, or a course desiignated by the department as providing the major design experience.

**The five-year total for the M.Eng. degree is 168 semester hours.

Doctor of Philosophy in Electrical Engineering

Major: EE
Degree: PhD
Unit: GS

The purpose of the following is to provide guidance to students pursuing the Electrical Engineering (EE) Doctorate. The general requirements for graduate study at the University of Louisville are contained in the Graduate Catalog.

Curriculum

The Ph.D. in Electrical Engineering is structured to be in strict conformity with the curricular requirements of the University of Louisville Graduate School. Completion of the program requires a minimum of 48 semester hours beyond a Master's degree in electrical engineering. The curriculum includes coursework in advanced mathematics, in-discipline technical electives, and additional program electives.

	Semester Hours	Total
Minimum Curricular Requirements of the Program:		
Mathematics	6	
In-Discipline Electives	15	
Program Electives	9	
Dissertation	18	
Minimum Total		**48**

The mathematics requirement of six hours provides the analytical background necessary to complete the demanding program of study and research in advanced engineering topics. Approved mathematics electives are drawn from both the Computer Engineering and Computer Science Department in the Speed Scientific School and the Mathematics Department in the College of Arts and Sciences.

Candidates must take 15 graduate level semester hours of in-discipline (electrical engineering) electives and 9 graduate level semester hours of program electives chosen from other departments in the Speed Scientific School and/or from other departments in the University as determined in consultation with the dissertation advisor. Together, the in-discipline electives and program electives must support the candidate's research effort and constitute an integrated program of study. The student's advisor and the Chair of the Electrical Engineering Graduate Studies Committee must approve individual course plans.

Objectives

The objective of this program is to prepare the student for practice, research and/or teaching of electrical engineering at the advanced level. Upon the completion of the program, the student should be able to analyze a broad range of advanced problems in his or her field of specialization and determine the appropriate analysis technique or solution. It is necessary that the student be able to implement the technique or solution, using the tools available to him or her, whether that is design and simulation using computers or paper and pencil analysis. It is expected that the student will publish his or her dissertation research in at least one refereed publication in a national or international journal.

Contact Information

For admission applications and additional information on financial assistance, contact:

Lisa Bell, EE Ph.D. Program Secretary
llbell02@athena.louisville.edu
W.S. Speed Hall, Room 200
University of Louisville
Louisville, KY 40292

English (ENGL)

www.louisville.edu/a-s/english

Graduate Program Faculty

Chair
Debra Journet, Professor

Professors
Dale B. Billingsley
Thomas B. Byers
Geoffrey A. Cross
Julia C. Dietrich
Alan C. Golding, Director of Undergraduate Studies
Susan M. Griffin
Dennis R. Hall
Suzette A. Henke, Thruston B. Morton, Sr. Professor
Brian Huot, Director of Composition
Estella C. Majozo
Robert H. Miller
Sena J. Naslund
Jeffrey T. Skinner, Director of Creative Writing
Robert N. St. Clair
Thomas A. Van

Associate Professors
David Anderson
Beth Boehm, Director of Graduate Studies
Karen Chandler
Mary C. Flannery
Paul F. Griner
Carol Mattingly
Karen A. Mullen, Director of IESL
Mary I. Rosner
Pamela D. Takayoshi

Assistant Professors
Matthew Biberman
Marc Bousquet
Susan Ryan
A. Elizabeth Willey

Emeritus/Emerita
Lucy M. Freibert
Harold E. Richardson
Mary Ellen Rickey

Instructor
Elaine Wise

Information

The Department of English, in the College of Arts and Sciences, offers a Doctor of Philosophy degree in English Rhetoric and Composition and 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, or on-line at: www.louisville.edu/a-s/english.

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, English Department, University of Louisville, Louisville, Kentucky 40292.

Satisfying Foreign 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 with the grade of "B", a 500-level, 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, Greek, Italian, Latin, Russian and Spanish.

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: PhD
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 College Composition	3	
ENGL 620, Research in the Composing Process	3	
ENGL 671, History of Rhetoric I		
or 672, History of Rhetoric II	3	
ENGL 691, Contemporary 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 College of Education and Human Development 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
Minimum Total		**48**

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 (ordinarily statistics or a computer language) 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. Intern experience may include teaching in regular freshman and advanced writing courses and tutoring in the Writing Center. 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 for 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 and professional 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 Graduate School 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 one copy 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

Admission to the Masters Program

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: Contemporary 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.

Fine Arts (FA)

www.louisville.edu/a-s/finearts

Graduate Program Faculty

Chair
James Grubola, Professor

Professors
Ying Kit Chan
Robert L. Douglas, Sr.
Stephanie J. Maloney
Steven Skaggs
John Whitesell

Associate Professors
Thomas Buser
Linda M. Gigante
Lida G. Gordon
Barbara L. Hanger
Jay M. Kloner

Assistant Professor
Christopher Fulton

Emeritus/Emerita
Henry Chodkowski, Jr.
Dario A. Covi, Allen R. Hite Professor of Fine Arts
Suzanne Mitchell
William D. Morgan

Programs

The Department of Fine Arts offers a Ph.D. in art history and a master's degree in fine arts with tracks in art history, studio art, and critical and curatorial studies. 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. 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 31 semester hours.

Ph.D. in Art History

Major: ARTH
Degree: PHD
Unit: GA

Coursework required for the Ph.D. in Art History includes completion of the M.A. plus 15 hours ARTH 500-level electives, 15 hours ART 600-level electives, 6 hours of Dissertation Research, 6 hours of graduate level electives outside art history program, 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 Essays 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 written comprehensive exams in two areas (majors, minor) before admission to candidacy. Language requirements must have been met and most course work 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 Fine Arts (pending approval)

Major: Art
Degree: MA
Unit: GA

With a Concentration in Art History
Applicants for admission to the Master's Program in this track are expected to demonstrate competence in the history of art, equivalent to an undergraduate major.

The Art History Placements Essays must be taken within the first year of the 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 Concentration. 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.

Each student must complete a core curriculum (16 hours) consisting of Art History 541 ("Modern Perspective in the Visual Arts"), six (6) hours of 500 or 600-level electives in the Department of Fine Arts, three (3) hours of 500 or 600-level electives outside the Department, three (3) hours of thesis guidance, and a one (1) hour graduate seminar.

The concentration in Art History will require fifteen (15) hours of 500 or 600-level courses with a minimum of one course in each of the following areas: Ancient or Medieval; Renaissance or Baroque; and Modern, concluding with a written thesis. 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. A reading knowledge of one foreign language is required (see above).

With a Concentration in Critical and Curatorial Studies
Applicants for admission to the Master's Program in this track are expected to demonstrate competence in the history of art, studio art or arts management equivalent to an undergraduate major.

Each student must complete a core curriculum (16 hours) consisting of Art History 541 ("Modern Perspectives in the Visual Arts"), six (6) hours of 500 or 600-level electives in the Department of Fine Arts, three (3) hours of 500 or 600-level electives outside the Department, three (3) hours of thesis guidance, and a one (1) hour graduate seminar.

The concentration in Critical and Curatorial Studies will require fifteen (15) hours of coursework consisting of Approaches to Critical Inquiry, Museum Methods I and II, Arts Management, and Internship, concluding with a written thesis, exhibition or a curatorial project. The exhibition or curatorial project may be produced in cooperation with the University's Galleries, the J.B. Speed Art Museum or in another museum or gallery authorized by the Department, and should take place during the candidate's last year of study. To fulfill this requirement through an exhibition or project, the candidate must submit a prefatory statement written by the candidate, and documentation of the exhibit or project. This documentation may include an exhibition catalog and/or photographic reproductions of the exhibition or project 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 statement will be submitted in conformity with the regulations governing the form and presentation of the written master's thesis.

With a Concentration in Studio Art
Applicants for admission to the Master's Program in this track are expected to complete training equivalent to an undergraduate major. To demonstrate his/her ability to pursue study at the 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. Contact the department for complete portfolio requirements.

Each student must complete a core curriculum (16 hours) consisting of Art History 541 ("Modern Perspectives in the Visual Arts"), six (6) hours of 500 or 600-level electives in the Department of Fine Arts, three (3) hours of 500 or 600-level electives outside the department, three (3) hours of thesis guidance, and a one (1) hour graduate seminar.

The concentration in Studio Arts will consist of fifteen (15) hours of 500 or 600-level courses taken in 2-D Studios, and/or 3-D Studios concluding with a thesis exhibition. The thesis exhibition, which must be authorized by the Department, should take place during the candidate's last semester of study. To accompany this exhibition, the candidate must submit a catalog containing a prefatory statement written by the candidate, a properly documented list of works in the exhibition, photographic reproductions of the work 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.

Master of Arts in Teaching in Art Education (certification in grades P-12)

Major: EDAR
Degree: MAT
Unit: GE

Admission to the P-12 MAT Program: Bachelors degree with 2.5 GPA or "C" or better in a writing course, speech, within nine (9) credits of completing the content major with a minimum GPA of 2.5, additional Teacher Education requirements, GRE score of at least 800 (combined verbal and quantitative), and admission to the Graduate School.

	Semester Hours	Total
P-12 Master of Arts Teaching degree in Art		
EDTL 602, Exploring Teaching within the Socio-Cultural Context of P-12 Schools	3	
ECPY 607, Learning Theory and Human Growth and Development **Note:** The above two courses must be taken prior or concurrently with the next two courses.	3	
ART 508, Art Education Methods/Research I	3	
ART 518, Art Education Methods/Research II	3	

Midpoint Assessment: Completion of all education courses listed above with a minimum of 3.0 in each, within nine credits (9) of completing the content major with a minimum 2.5 GPA, PRAXIS exam has been taken, recommendation of advisor.

Six hours chosen from among:
EDTL 615/616, Student Teaching Primary/Intermediate
OR
EDTL 617, Student Teaching Middle School
OR
EDTL 619, Student Teaching Secondary 3
EDSP 545, Exceptional Child in a Regular Classroom 3

Certification Exit Assessment: "B-" or better in Student Teaching, satisfactory portfolio, passing score on PRAXIS, 2.5 GPA overall and 2.5 GPA in content area.

EDTL 503, Developing Cross-Cultural Competence* 3
ART 500, Level Academic Support Course 6

Elective: Choose six (6) credits from:
EDTL 504, Teaching with Technology** 2
EDTL 505, Challenging Advanced Learners** 1
EDTL 620, Reading and Writing Across the Curriculum/Adolescent Literature* 3
EDTL 621, PDS Intensive Field Experience** 3
ART 500, Level Academic Support Course 3

* Can be taken at any point in the program
**Can be taken concurrent with or after Content Methods Course
Minimum Total 36

MAT Degree Exit Assessment "B-" or better in each Student Teaching Placement, Certification Exit Requirements, plus a satisfactorily updated portfolio, and a 3.0 GPA overall.

Foreign Lanugage Education (FLE)

www.louisville.edu/a-s/cml/

Graduate Program Faculty

Chair
Wendy E. Pfeffer, Professor

Professors
Roy L. Ackerman
Howard B. Altman
Rhonda Buchanan
William L. Cunningham
Alan C. Leidner
Frank Nuessel
Sydney P. Schultze

Associate Professors
Anne Greenfeld
Mary Makris
Manuel Medina

Emeritus/Emerita
Fortuna Gordon
David R. Hershberg
Hubert Papailler
Hans Petersen
Marilyn V. Schuler
David R. Hume

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.

Master of Arts in Foreign Language Education

Major: FLE
Degree: MA
Unit: GA

	Semester Hours	Total
Core Courses		
FLE 521, Teaching in Foreign Languages	3	
One course from the following:		
FREN 523, Advanced Composition and Conversation	3	
SPAN 523, Advanced Composition and Conversation	3	
GERM 523, Advanced Composition and Conversation	3	
One Course from the following:		
FREN 624, Applied French Linguistics	3	
SPAN 624, Applied Spanish Linguistics	3	
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 (15) 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 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**

Geography & Geosciences (GEOG/GEOS)

www.louisville.edu/a-s/geog

Graduate Program 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
Darren M. Scott

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.

	Semester Hours	Total
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	
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 Geography	3	
GEOG 561 Urban Environmental Quality	3	
GEOG 578 Downtown Growth and Development	3	
GEOG 628 Planning History and Issues	3	
GEOG 635 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 Transportation Geography	3	
GEOG 561 Urban Environmental Quality	3	
GEOG 578 Downtown Growth and Development	3	
GEOG 628 Planning History and Issues	3	
GEOG 635 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 Planning History and Issues	3	
GEOG 635 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 (HPES)

www.louisville.edu/edu/hpes/physical.html

Graduate Program Faculty

Chair
Richard A. Fee, Professor

Professors
Sharleen Johnson Birkimer
Cheryl A. Kolander
P. Joanne Rowe
Bryant A. Stamford
Ann M. Swank

Associate Professors
Mary A. Hums
Carol Stinson
William T. Weinberg

Assistant Professors
Kent Adams
Daniel F. Mahony
Anita J. Moorman

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, the Master of Science in Sport Administration, 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 general information section of the catalog. The MAT is designed for students seeking teacher certification. Please contact the department for more information.

Master of Arts in Teaching in Physical Education (certification in grades P-12)

Major: P ED
Degree: MAT
Unit: GE

Admission Requirements

1. Admission to Graduate School
2. Admission to Teacher Education
3. EDTL 502/602 Exploring Teaching within the Socio-Cultural Context of P-12 Schools, ECPY 507/607 Learning Theory and Human Growth and Development

	Semester Hours	Total
Professional Education Courses		
HPES 605, Teaching and Learning for Elementary Physical Education	6	
HPES 606, Teaching and Learning for Secondary Physical Education	6	
HPES 609, Methods and Practical Living: Health	3	
HPES 610, Experiential Outdoor Education	3	18
Exit Requirement		
HPES 611, Seminar: Student Teaching in Health and Physical Education	3	
HPES 612, Student Teaching in Health and Physical Education I	6	
HPES 613, Student Teaching in Health and Physical Education II	6	
HPES 614, Action Research Project	3	18
Minimum Total		**30**
Minimum 3.0 GPA required for graduation.		36

Note: The teaching minor in Health Education (21 hours) is generally completed in conjunction with this program. Course requirements are available in the College of Education and Human Development Advising Center.

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 609, Research Methods	3	
HPES 631, Organization and 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		
Student 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		
HPES 607, Methods of Supervision in Physical Education	3	
HPES 608, Curriculum: An Achievement Based Approach	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 6, 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

	Non-Thesis	Thesis
Required Courses for Each Option		
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 611, Principles of Electrocardiography	3	3
EXP 699, Thesis		1-6
EXP 604, Advanced Topics in Exercise Physiology		
EDFD 601, Applied Statistics	3	3
Mnimum Total	**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.)

Master of Science in Sport Administration (pending approval)

Major: SPAD
Degree: MS
Unit: GE

	Semester Hours	Totals
Core Courses		
EDFD 600, Introduction to Research Methods and Statistics	3	
HPES 604, Research Methods in HPES	3	
SPAD 505, Sport Facility Management	3	
SPAD 604, Financial Principles in Sport	3	
SPAD 625, Sport Administration	3	
SPAD 683, Sport Marketing	3	
SPAD 684, Current Trends and Issues in Sport Administration	3	
SPAD 689, Legal Aspects in the Sport Industry	3	
SPAD 692, Internship in Sport Administration	3	
Electives		
HPES 649, Psychological Aspect of PE and Sport	3	
SPAD 529, American Women in Sport	3	
SPAD 561, Sport Publicity and Promotions	3	
SPAD 661, Special Topics in Sport Administration	3	
SPAD 680, Athletics and Higher Education	3	
Business School courses		
College of Education and Human Development courses		
Other courses approved by an advisor		
Minimum Total		**36**

History (HIST)

www.louisville.edu/a-s/history

Graduate Program Faculty

Chair
Thomas C. Mackey, Associate Professor

Professors
Bruce F. Adams
Ann T. Allen
Mark E. Blum
John T. Cumbler, Jr.
Benjamin T. Harrison
Robert B. Kebric
Justin A. McCarthy
Andrea L. McElderry, Vice Chair and Director of Graduate Studies
Nancy M. Theriot
Lee Shai Weissbach

Associate Professors
Susan J. Herlin
Tracy E. K'Meyer
Thomas C. Mackey
John E. McLeod
Kerry E. Spiers
Bruce M. Tyler
Jonathan R. Ziskind

Assistant Professors
Blake R. Beattie

Program

The Department of History, in the College of Arts and Sciences, offers programs leading to the degree 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.

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.

Quality of Work

Good standing requires a graduate GPA of 3.00.

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 Option	Exam Option
Required Course Work		
Major Area of Emphasis	15-18	18-21
Secondary Area of Emphasis	6-12	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. Committee members must be approved by the Dean of the Graduate School. 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 (HUM)

www.louisville.edu/a-s/humanities

Graduate Program Faculty

All members of the graduate faculties of the Departments of English, Fine Arts, Classical and Modern Languages, Music History, Philosophy, 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

Howard B. Altman, Classican and Modern Languages; Linguistics
John H. Flodstrom, Philosophy. Emeritus
Melvin E. Greer, Philosophy. Emeritus
Riffat Hassan, Humanities, Religious Studies
Thomas S. Maloney, Philosophy
Dismas A. Masolo, Philosophy, Justus bier Distinguished Professor of Humanities
Frank Nuestel, Classical and Modern Languages; Linguistics
Robert N. St. Clair, English; Linguistics
John W. Shumaker, Humanistic Studies, University President
Arthur J. Slavin, Justus Bier Distinguished Professor of Humanities, Emeritus
Osborne P. Wiggins, Jr., Philosophy

Associate Professor

Charles F. Breslin, Philosophy, Emeritus
Robert H. Kimball, Philosophy
Mary Ann Stenger, Humanities, Religious Studies

Assistant Professor

Avery Kolors, Philosophy

Programs

The Humanities Division of the College of Arts and Sciences offers three 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.

Master of Arts in Humanities

Major: HUM
Degree: MA
Unit: GA

1. **Traditional M.A. concentration** (thesis option or non-thesis option):
   1. A total minimum of 30 semester hours as follows:
      - 12-15 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) or three semester hours in directed study project.
      - 9-12 semester hours in second discipline/area.
   2. A minimum of 15 semester hours must be in courses at the 600 level, excluding thesis hours or directed study 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 or directed study project..

Traditional MA with Thesis	**Traditional MA: Non Thesis**
(minimum of 30 hours)	(minimum of 30 hours)
12-15 hours in 1 discipline/area	12-15 hours in 1 discipline/area
9-12 hours in 2nd discipline/area	9-12 hours in 2nd discipline/area
3 hours in Methods	3 hours in Methods
6 hours in Thesis	3 hours in Directed Study project (interdisciplinary research project that combines 2 disciplines/area)
Foreign Language Competency**	Foreign Language Competency**
Example:	**Example:**
12 hours in Religious Studies	15 hours in Philosophy
9 hours in Art History	9 hours in Literature
3 hours of HUM 510/610	3 hours of HUM 609
6 hours of thesis	3 hours of Directed Study project
Foreign Language Competency**	Foreign Language Competency**

2. **Concentration in Humanities and Civic Leadership:** non-thesis* (minimum of 30 hours):
   - 12 hours in one discipline/area:
   - 3 hours in Methods (600-level) ;
   - 3 hours in second discipline/area;
   - 6 hours in Internship (600-level);
   - 3 hours Direct Study Project;
   - 3 hours in Interdisciplinary Seminar in Humanities and Civic Leadership (600-level);
   - No foreign language requirement; demonstrated writing proficiency for entrance.
   - *This program is also offered for a dual degree with the Law School (JD/MAHUM).
3. **Concentration in Linguistics and the Humanities:** non-thesis (minimum 30 hours)
   - 15 hours in the following Linguistic courses:
   - LING 518 Foundations of Language
   - LING 620 Phonics and Phonology
   - LING 630 Language and Culture
   - LING 603 Syntax
   - LING 690 Seminar in Linguistics (variable topics)
   - 9 hours in a second discipline/area
   - 3 hours of Methods: HUM 609 or 610
   - 3 hours in Directed Study Project
   - Foreign Language Competency

Accelerated BA/MA in Humanities

Major: HUM
Degree: MA
Unit: GA

Students who wish to pursue an accelerated Masters degree, will be allowed to apply to the Baccalaureate degree up to 9 hours of coursework taken for graduate credit. Twenty-one (21) hours of graduate coursework in addition will constitute the minimum number of credit hours for obtaining the MA. The guidelines for the Accelerated (BA/MA in Humanities) are as follows:

1. Students must apply no later than the end of the junior year for admission to the accelerated program.
2. A minimum overall grade point average and major grade point average of 3.35 will be required for admission to and for retention in the program.
3. Student must complete the GRE and fill out the Humanities Division application for the accelerated BA/MA in Humanities.
4. Student may take a maximum of 9 hours for graduate credit, which will also apply to the requirements for the baccalaureate degree in Humanities.
5. The accelerated BA/MA in Humanities will be offered for the Traditional Concentration and for the Linguistics Concentration, but not for the Concentration in Humanities and Civic Leadership.
6. Students who enroll in the accelerated BA/MA in Humanities may elect the thesis option or non-thesis option, which ever is appropriate to the concentration and course of study.
7. All students in the program will take either HUM 609 or HUM 610 to fulfill the "theory requirement".
8. All of the requirements remain the same, including the foreign language requirement.

Industrial Engineering (IE)

www.louisville.edu/speed/industrial

Graduate Program Faculty

Chair
Suraj M. Alexander, Professor

Professors
William E. Biles, Clark Professor of Computer-Aided Engineering
Gerald W. Evans
Carol O'Conner Holloman
Waldemar Karwowski
Herman R. Leep
G. Don Taylor, Jr., Duthie Professor of Engineering Logistics
John S. Usher
Thomas L. Ward, Emeritus
Mickey R. Wilhelm, Associate Dean for Research

Assistant Professor
Gail W. DePuy

Associates
Mahesh Gupta
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 in Industrial Engineering and the Master of Engineering in Engineering Management. 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.

Doctor of Philosophy in Industrial Engineering

Major: IE
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 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 Requirements

Candidates for admission into the MSIE degree program must satisfy the following requirements for admission:

1. Baccalaureate degree with complete transcripts
2. 2.75/4.00 GPA for unconditional admission
3. A combined verbal and quantitative score for the GRE basic examination of at least 1000
4. For international students, a TOEFL score of at least 535

Prerequisite Requirements

A candidate with a BSIE degree will have to give evidence of having taken the courses listed below for non-BSIE degree holders. A candidate with a BS degree in an engineering discipline other than IE must take the following courses, unless his/her transcript contains an equivalent course.

EMCS 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

A candidate with a baccalaureate in an area other than engineering (e.g., mathematics, physics, psychology) must take all of the courses above prerequisites, plus any other courses his/her thesis advisor deems appropriate.

	Semester Hours	Total
Required Courses		
The following core of graduate courses is required.		
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

In addition to this core of IE courses which form a "Breadth Requirement" for the MSIE, the candidate must take at least three additional courses in one of the four stem areas.

Operations Research and Systems
Manufacturing Engineering
Human Factors Engineering
Production Systems.....9.....9

The specific courses selected will be a discretion of the candidate and his/her advisor.

Minimum Total.....30

Advising

Entering MSIE students will be advised by the MSIE Program Coordinator, Dr. Evans, with consultation with another member of the IE faculty. The candidate must select a thesis advisor prior to registering for his/her second semester (term) in residence.

Master of Engineering with specialization in Industrial Engineering

Major: IE
Degree: MENGIE
Unit: GS

The Master of Engineering with specialization in Industrial Engineering (M.Eng.I.E.) is a professional degree offered by the Speed Scientific School. It is accredited at the advanced level by the Accreditation Board for Engineering and Technology (ABET). Students can obtain a concentration in Manufacturing Engineering as part of their degree program.

Admission

Requirements for admission or readmission include:

1. Completion of a program of studies equivalent to that obtained through the Speed Scientific School Division of Pre-Engineering and Basic Studies for the field of industrial engineering;
2. Recommendation by the faculty and chair of the Department of Industrial Engineering; and
3. A cumulative baccalaureate program grade-point avereage of 2.50/4.00 for unconditional admission.

Prerequisite Requirements

Since the M.Eng.I.E. is accredited as part of a five year program, the requirements of item (1) above in the section of Admissions must be satisfied exactly. This is very difficult for students who have not matriculated through the preceeding four years at the Speed School. Therefore, almost all students who earn an ABET accredited undergraduate degree pursue the MSIE or Ph.D. degrees.

Degree Requirements

The minimal requirements for eligibility for the M.Eng.I.E. are set below.

Course/Credit Hours

The academic courses and three completed cooperative internships periods required in the Divisions of Pre-Engineering and Basic Studies (or equivalent) (3)

IE 540, Robots and Manufacturing (3)
IE 600, Advanced Manufacturing Methods (3)
IE 640, Applied Systems Analysis (3)
IE 650, Material Flow Systems Design (3)
IE 683, Design of Man-Machine Systems (3)
IE 697, M.Eng. Thesis in Industrial Engineering (8)
IE xxx, Approved industrial engineering depth electives[1] (9)

TOTAL = 168

[1] Nine semester hours of electives must be taken from one of the following four groups.

Human factors engineering: IE 681, 685, 687
Manufacturing engineering: IE 545, 601, 605, 606, 673, 687
Operations research: IE 610, 611, 642, 643, 673
Production systems: IE 606, 630, 631, 660

Advising

M.Eng. IE candidates are advised by the department chairman.

Master of Engineering with specialization Engineering Management

Major:
Degree: MENGEM
Unit: GS

The Master of Engineering with specialization in Engineering Management (M.Eng.E.M.) is a professional degree offered by the Speed Scientific School. It is a part time, evening degree program open only to those students who have graduated from an ABET-accredited engineering degree program.

Admission

A requirement for admission to the program is that the applicant possess a bachelor's degree in engineering from a college or university offering programs which are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. In addition, it is expected that the student be actively engaged in full-time professional employment during the period of enrollment in the degree program.

Prerequisite Requirements

A calculus-based course in probability and statistics is a required prerequisite. The assumption is made that entering students are reasonably competent in a computer programming language such as BASIC, C, FORTRAN, PASCAL, etc.

Degree Requirements

Students may choose either a thesis curriculum or an alternative curriculum that permits graduation without preparation of a thesis. If the thesis curriculum is selected, the student must submit a written thesis and present it orally before an examining committee. In order to emphasize the strong orientation of the program toward the solution of ongoing practical problems in the management of technological enterprises, every effort is made to select a thesis topic which involves regular employment experience. The ability of the student to perform an in-depth study of such a problem with the guidance and assistance of a faculty advisory committee is judged to be an important part of the program under the thesis option

In the alternative curriculum for the Master of Engineering degree, the eight (8) semester hours of thesis credits are replaced with six (6) semester hours of additional engineering management or industrial engineering approved course electives, plus two (2) semester hours of independent study in engineering management resulting in a project paper. The purpose of the project paper is to provide the student with an opportunity to practically utilize, in a real world setting, an amalgam of subject matter from the engineering management discipline. Each student choosing this option will undertake an independent study and report the findings in a paper. This grade will be based upon the quality of the written report, after consideration of any clarifications provided by the student in an oral discussion of the paper. The oral discussion is only required to clarify any questions about the paper, and is initiated by the faculty advisor.

The requirements for the Master of Engineering degree, with specialization in the field of engineering management are as follows:

Course/Credit Hours

EM 515, Operations Research (3)
EM 570, Engineering Economic Analysis (3)
EM/IE xxx, Probability or statistics approved elective (3)
EM/IE xxx, Management science approved electives[2] (6)
EM/IE xxx, Engineering management or industrial engineering approved electives[2] (9)
EM 690, M.Eng. Thesis in Engineering Management[1] (8)

TOTAL = 32

Note:

[1] The faculty of the Industrial Engineering Department have approved an alternative curriculum that permits students to graduate without preparing a thesis. For students selecting this alternative, the 8 semester hours of M.Eng. thesis in Enginering Management will be replaced with 6 semester hours of courses selected from the approved list of engineering management or industrial engineering electives. in addition, the student selecting this alternative curriculum will be required to successfully complete 2 semester hours of EM 693 - Independent Study in Engineering Management resulting in a project paper.

[2] The requirements of the Kentucky Council on Higher Education specify that a minimum of 12 semester hours (excluding thesis credit) must be completed in courses at the 600-level or above for the Master of Engineering degree.

Advising

M.Eng.E.M. candidates will be advised by the M.Eng.I.E. Program Coordinator, Dr. Biles.

Interdisciplinay Studies (IS)

www.graduate.louisville.edu

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 Student Services of the Graduate School, 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 the Graduate School 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 the Graduate School. 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) or six (6) additional hours of 600- level courses for non-thesis. 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 the Graduate School.

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: email: graduate@louisville.edu

Graduate Student Services
Jouett Hall, LL02
University of Louisville
Louisville, Kentucky 40292

Justice Administration (JA)

www.louisville.edu/a-s/justice

Graduate Program Faculty

Chair
Deborah G. Wilson, Professor, Graduate Coordinator

Professors
J. Price Foster
Ronald M. Holmes
Richard Tewksbury
Gennaro F. Vito

Associate Professors
Terry D. Edwards
Elizabeth L. Grossi
William F. Walsh

Assistant Professor
Thomas Whetstone

Emeritus/Emerita
B. Edward Campbell
John C. Klotter

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 exclusively 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 on-line application form for admission to the Graduate School, University of Louisville www.graduate.louisville.edu.
- $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 the completion of at least 36 graduate credit hours. The completion of these credit hours may include either thesis or non-thesis options. The thesis option requires the completion of 30 semester hours of graduate level courses and a thesis for a total of 36 credit hours. The non-thesis professional paper option requires the completion of 33 semester hours of graduate courses plus a professional paper for a total of 36 credit hours. The non-thesis comprehensive examination option requires the completion of 36 hours of graduate course work and passing scores on a series of comprehensive exams.

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.

The degree will also be offered in web-based format beginning in Fall 2001. See department web-page for more information.

	Semester Hours		
	Thesis	Professional Paper	Comp Exam
Required Core Courses			
JA 621, The Criminal Justice System	3	3	3
JA 625, Legal Aspects of Criminal Justice Management	3	3	3
JA 643, Theories of Crime and Delinquency	3	3	3
JA 649, Applied Statistics in Criminal Justice	3	3	3
JA 650, Research Methods in Criminal Justice	3	3	3
Electives (to be approved by advisor)	15	18	21
Thesis	**6**		
Professional Paper		**3**	
Minimum Total	**36**	**36**	**36**

Leadership, Foundations, and Human Resource Education (ELFH)

http//leader.louisville.edu/hre/index.htm

Graduate Program Faculty

Chair
Carolyn Rude-Parkins, Associate Professor

Professor
Everett Eggington
Joseph M. Petrosko
Douglas J. Simpson
John L. Strope, Jr.

Associate Professors
Timothy Hatcher
John L. Keedy
Steven K. Miller
Keith L. Raitz
John F. Welsh

Assistant Professor
Mike A. Boyle
Namok Choi
Patricia K. Leitsch
Donna H. McCabe
Paul A. Winter

Emeritus/Emerita
Keith Bayne
Edward H. Berman
Richard K. Crosby
Robert E. Hoye
Thomas S. Jeffries
Gordon C. Ruscoe
Robert R. Schulz
Francis C. Thiemann

Programs

The Department of Leadership Foundations and Human Resource Education offers a variety of programs including Human Resource Education and Instructional Technology through the Master of Education degree. These programs available to graduate students provide considerable flexibility to pursue expanded professional careers in schools as well as 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.

Courses in Foundations of Education support the College of Education and Human Development programs in teaching research and service in the area of teaching basic and advanced courses in research and urban education are offered, many of which are specifically designed for doctoral students. Assistance to graduate students in design and implementation of research is provided in the area of research, faculty work with teachers and other educational professionals in collaborative investigations as well as conducting research on the historical, philosophical, and sociological basis of schooling and education. In the area of service, the faculty provides training and technical assistance to students and education professionals from Latin America.

Degrees offered in Administration and Higher Education include the Doctor of Education, Master of Education in Educational Administration, and Master of Arts in Higher Education (optional concentration in Sport Administration). 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 opened to individuals within or outside professional education.

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.

Master of Education in Educational Administration

Major: HED
Degree: MED
Unit: GE

Leads to professional certificate for instructional leadership P-12 principal.

Program Admission Requirements
Admission to this program and the Graduate School requires:

- Qualification for a Kentucky Classroom Teaching Certificate
- General Test Section score on the Graduate Record Exam of 800 "V+Q"
- A 2.75 Grade Point Average on a 4.0 scale on all collegiate preparation
- Successful completion of the Kentucky Teacher Internship Program, as provided in 704 KAR20:045, or two years (one year = 140 minimum contract days) of successful P-12 teaching experience outside of the state of Kentucky.

	Semester Hours	Total
Professional Area (18)		
EDAD 604, Instructional Leadership and Supervision	3	
EDAD 607, Principles of Educational Leadership	3	
EDAD 608, K-12 Leadership	3	
EDAD 609. Internship in Educational Leadership	3	
EDAD 612, Human Resource Management	3	
EDAD 620, Legal Issues in P-12 Education	3	18
Cognate Area (12) (must be approved by the advisor)		
* EDFD 600, Introduction to Research Methods and Statistics	3	
EDFD xxx (Selected with Advisor approval)	3	
EDAD 603, Leadership in a Reform Environment	3	
Elective (selected with advisor approval)	3	12
Minimum Total		30

Note: * Must be taken in first 9 hours. This program completes ONLY Level 1 Certification for Principal.

Program Completion Requirements
1. A grade point average of 3.0 in all courses counting on the program
2. Successful completion of a portfolio. Information about the portfolio is found in "Guideline for portfolio completion requirements" available from your advisor.

Certification Requirements
1. Satisfactory completion of the Kentucky Assessment Program for principal certification. Current information about the Kentucky assessment program may be obtained in the Education Advising Center. Assessment includes: (1) A minimum score of at least 85% on the Kentucky Specialist Test of Instructional and Administrative Practices; and (2) a minimum score of at least 155 on the School Leaders Licensure Assessment.
2. Completion of three (3) years of full-time teaching experience
3. Successful completion of the Kentucky Principal Internship Program

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 a Rank I program or the Ed.S. or the Ed.D degree 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 LFHRE 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 609, Internship in Educational 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 603, Administrative Leadership in a Reform Environment	3	
EDAD 610, Collaboration and Communication for Effective Leadership	3	
EDAD 622, Educational Resource Management in P-12 Education	3	12
EDAD 720, Advanced Internship in Administration and Supervision	3	
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 Leadership Foundations and Human Resource 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 a Rank I program or the Ed.S. or Ed.D degree. 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 P-5, middle grades 5-8, high school 7-12, high school 8-12, 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	
EDAD 604, Instructional Leadership and Supervision	3	
EDAD 607, Principles of Educational Leadership	3	
EDAD 608, K-12 Leadership	3	
EDAD 609, Internship in Educational Leadership	3	18
Level II Courses: (First 5-year Renewal)		
EDAD 610 Collaboration and Communication for Effective Leadership	3	
EDAD 612 Human Resource Management	3	
EDAD 620, Legal Issues in P-12 Education	3	
EDAD 720, Advanced Internship in Administration and Supervision	3	
Curriculum/Instruction course approved by advisor	3	15
Minimum Total		**33**

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 a 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	18
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, College of Education and Human Resources, 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

Master of Education in Human Resource Education

Major: HRE
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**

Master of Education in Instructional Technology

Major: IT
Degree: MED
Unit: GE

	Semester Hours	Total
Required Courses (15)		
EDFD 600, Introduction to Research Methods and Statistics ***or*** EDFD 696, Action Research (if EDFD 600 was already taken)**	3	
EDTL 622, Orientation Readings (first course for teachers)**	3	
EDTD 611, Introduction to Performance Improvement (first course for trainers)	3	
EDTL 627, Capstone Course (last course for teachers)**	3	
EDTD 616, Capstone and Portfolio Course (last course for trainers)*	3	15
Curriculum Integration (6 hours)		
Six (6) hours for teachers selected with advisor approval***	3-3	
EDTD 662, Organizational Analysis (trainers) ***AND***	3	
EDTD 672, Instructional Design and Development (trainers)**	3	6
Strand: Instructional Technology (15)		
EDTD 675, Web Use and Publishing	3	
EDTD 676, Authoring Multi-media Instruction**	3	
EDTD 677, Technical Support Skills*	3	
Electives: Select six (6) hours from:		
EDTD 574, Using Productivity Tools (teachers)*	3	
EDTD 674, Technology Leadership Seminar (teachers)**	3	
EDTD 671, Leadership in Instructional Technology (trainers)	3	
EDTD 695, Distance Teaching and Learning**	3	6
Minimum Total		**30**

Note: * Computing and Technology Literacy
** Computing and Technology Leadership
*** Two curriculum integrated courses such as: EDSD 626 Technology Applications for Math and Science (8-12); EDEM 629 Teaching Math and Technology (P-8); EDSP 627 Applications of Assistive Technology (P-12); EDTD 673 Curriculum and Technology Seminar (P-12).

Mathematics (MATH)

www.math.louisville.edu/a-s/mathematics

Graduate Program Faculty

Chair
Kevin Clancey

Professors
Patricia B. Cerrito
Richard M. Davitt
Michael S. Jacobson
Krzysztof M. Ostaszewski
Lee Larson, Director of Graduate Studies
Inessa Levi
Robert B. McFadden
Prasanna Sahoo
W. Wiley Williams

Associate Professors
George R. Barnes
Mary E. Bradley
Udayan B. Darji
Keith A. Kearnes
André Kezdy
Ewa Kubicka
Grzegorz Kubicki
Jeno Lehel
Robert Powers
Thomas Riedel
Steven Seif
Wei-Bin Zeng

Assistant Professors
Manabend Das
Gregory Rempala

Adjunct Professor
Stephen W. Looney

Emeritus/Emerita
Roger H. Geeslin
Thomas M. Jenkins
Lael F. Kinch
Lois K. Pedigo
Leland L. Scott
William H. Spragens

Doctor of Philosophy in Applied and Industrial Mathematics (pending approval)

Major: MATH
Degree: PHD
Unit: GA

Departmental Ph.D. Requirements

All students admitted to the proposed program must complete the following or their equivalent:

A. Core Courses - 24 semester hours:

(i) Two sequences, each of six (6) semester hours, chosen from

Algebra	Mathematics 621 and 622
Combinatorics	Mathematics 681and 682
Real Analysis	Mathematics 601 and 602

(ii) Two sequences, each of six (6) semester hours, chosen from:

Mathematical Modeling	Mathematics 635 and 636
Applied Statistics	Mathematics 665 and 667
Probability and Mathematical Statistics	Mathematics 660 and 662

B. Additional Topics and Area of Specialization - 18 semester hours in addition to the core:

In addition to the core, an application area of 18 hours will be required. The courses may be in a department outside of Mathematics. They will be chosen in consultation with the student's advisor.

C. Industrial Internship - six (6) semester hours:

Each student, with prior approval of the Graduate Studies Director and the Industrial Internship Director, has to complete at least six (6) semester hours of an internship in an appropriate industrial or governmental setting, or have equivalent experience.

D. Dissertation - 18 to 24 semester hours:

A doctoral dissertation is required of each student.

Examinations

a. Qualifying

Students must pass three written examinations. Two of these will be chosen from the areas Algebra, Combinatories and Real Analysis. The third will be chosen from the areas of Mathematical Modeling, Applied Statistics, and Probability and Mathematical Statistics. Normally, these will be taken within a year of completion of the core coursework. These examinations need not be taken together and each may be attempted at most twice.

Master of Arts in Mathematics

Major: MATH
Degree: MA
Unit: GA

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.
   c. (Internship Option): Serve a departmentally approved internship requiring advanced mathematical applications, and submit a detailed follow-up professional report. The internship must last one semester. A total of two full-year sequences in 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. Students choosing the Internship Option must pass a final oral examination as described under “Requirements for the Master’s Degree” in the General Information section of the Graduate School Catalog.
6. All students must demonstrate proficiency in communication of mathematics.

Mechanical Engineering (ME)

www.louisville.edu/speed/mechanical

Graduate Program Faculty

Chair
Glen Prater, Associate Professor

Professors
W. Geoffrey Cobourn
Michael L. Day
Julius P. Wong

Associate Professors
Timothy E. Dowling
William P. Hnat

Assistant Professors
Ellen G. Brehob
Robert S. Keynton
Peter M. Quesada

Emeritus Professors
Hsing Chuang
Robert L. Collins
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 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 Speed Scientific School Catalog).

Admission to the Doctoral Program

Unconditional admission into the Doctor of Philosophy program requires an earned mechanical engineering master's degree and the following credentials:

- Minimum undergraduate GPA of 3.0/4.0; minimum graduate GPA of 3.25/4.0.
- Three letters of recommendation, with at least two addressing the applicant's ability to perform independent research successfully.
- A composite score (verbal and quantitative) on the Graduate Records Examination (GRE) of no less than 1100 (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.

Qualified applicants may be admitted directly to the doctoral program after receiving a baccalaureate degree. These students will be required to complete an additional 30 hours of coursework at the 500 and 600 level under an individual plan developed in conjunction with the Chair of the Department's Graduate Studies Committee. Students with a B.S. in another branch of engineering, or in chemistry, mathematics, physics, or life sciences may be required to take up to 24 undergraduate units in mechanical engineering, and to demonstrate preparation comparable to that provided by an ABET accredited engineering program.

Admission to the M.S. Program

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 requirement, but with otherwise acceptable credentials, may be admitted on a conditional basis. New students will not 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.

Doctor of Philosophy in Mechanical Engineering

Major: ME
Degree: PhD
Unit: GS

The Department of Mechanical Engineering in the JB 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 Doctor of Philosophy in Mechanical Engineering. This program provides an opportunity for students to complete advanced course work and conduct independent research in the following specialization areas: Biomechanics or Advanced Product Design and Development.

Completion of the program requires forty- eight (48) semester hours beyond a Masters degree in mechanical Engineering, or seventy- eight (78) semester hours beyond a baccalaureate degree in Mechanical Engineering.

Required Core Courses	Semester Hours	Total
Research Seminar	3	
Advanced Mathematics	6	
Mechanical Engineering Technical Core (appropriate for the specialization area)	6	
Technical Electives	15	
Dissertation Research	18	
Minimum Total		**48**

Master of Science in Mechanical Engineering

Major: ME
Degree: MS
Unit: GS

	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 the 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 (MBIO)

www.louisville.edu/medschool/microbiology/

Graduate Program Faculty

Chair
Robert D. Stout, Professor

Professors
Ronald J. Doyle
David E. Justus
Uldis N. Streips
Jill Suttles

Associate Professors
Faye E. Austin
Lawrence A. Hunt
Girish J. Kotwal
Richard D. Miller
Haval Shirwan

Assistant Professors
Michele Kosiewicz

Research Assistant Professor
Pascale Alard

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 Molecular, Cellular, and Craniofacial Biology, Dentistry

Associates
John Barker, Associate Professor of Surgery
William G. Cheadle, Professor of Surgery
Jon B. Klein, Professor of Medicine
Gary S. Marshall, Professor of Pediatrics
Stephen C. Peiper, Professor of Pathology, Brown Cancer Center
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, VA Medical Center

Emeritus/Emerita
Robert D. Higginbotham
Pinghui Victor Liu
Kenneth F. Keller

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, two 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 catalog. Applicants are encouraged to apply early as space is limited. Applications are reviewed on a rolling basis beginning February 1st.

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.

Prospective students may be invited for a personal interview with members of the department.

Doctor of Philosophy in Microbiology and Immunology

Major: MBIO
Degree: PHD
Unit: GM

The minimum requirements for this degree in addition to those listed in the General Information section of this catalog include**:

Required Courses:

BIOC 645, Graduate Biochemistry I (4)
MBIO 600, Laboratory Rotations in Microbiology and Immunology (1-2)
MBIO 606, Seminar and Journal Club (2)
MBIO 667, Cell Biology (3)
MBIO 690, Research Methods in Microbiology and Immunology (3)
MBIO 619, Research (1-12)

Choose four (4) electives (at least two (2) must be offered by the Microbiology and Immunology Department). Suggested electives include:
MBIO 601, Introductory Pathogenic Microbiology (3)
MBIO 602, Introductory Immunology (2)
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)
BIOC 668, Molecular Biology (4)
BIOC 675, Biochemistry of Cancer (2)
CAMR 620, Methods in Cellular Fluorescence (3)

Note:
** Students enrolled in the M.D./Ph.D. Joint Degree Program who have completed step I of NBME will have satisfied all of the course requirements except seminar and research. They will be required to satisfactorily complete the Qualifying Exam and successfully defend a dissertation research project, in addition to attending all seminars.

Program of Study

Upon successful completion of the required course work, maintaining a minimum 3.0 GPA, 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 a written research proposal outside of his/her area of primary research, and oral defense of the project. Three to five faculty with expertise in the area of the proposal will be selected by the Chair to serve as the Examining Committee. The student may enter degree candidacy upon receipt of satisfactory judgment from the Examining Committee.

Dissertation Research

The student will decide on a dissertation research project after consulting with his/her Research Advisor. The student and Advisor will form 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 may serve as an ex-officio member of Dissertation Committees.

All Ph.D. candidates will prepare a research proposal in the format of an NIH grant application. This dissertation research proposal, with any revisions required by the Dissertation Committee, should be final and approved by the middle of the third year in the program.

The Committee will meet at regularly to evaluate progress of the research. The student will also be required to present a research seminar to the Department annually on this progress. When the dissertation research is completed, the Committee will conduct the final oral examination in accordance with the guidelines in the General Information section of this catalog.

For more information go to the department website at www.louisville.edu/medschool/microbiology/

Master of Science in Microbiology and Immunology

Major: MBIO
Degree: MS
Unit: GM

Required Courses	Semester Hours	Total
BIOC 645, Graduate Biochemistry I	4	
MBIO 601, Introduction to Pathogenic Microbiology	3	
OR		
MBIO 602, Introductory Immunology	2	
MBIO 606, Seminar and Journal Club	2	
MBIO 690, Research Methods in Microbiology and Immunology	3	
Choose two from the suggested list of electives:		
MBIO 658, Cellular and Molecular Immunology	3	
MBIO 667, Cell Biology	3	
MBIO 670, Molecular Virology	3	
MBIO 680, Microbial Genetics	3	
MBIO 685, Microbial Physiology	3	
MBIO 687, Microbial Pathogenesis	3	
MBIO 619, Research	1-12	
MBIO 620, Thesis *(optional)*	1-6	
Minimum Total		**30**

If the student has satisfactorily completed the required courses and total credit hour requirements with an overall and program GPA of 3.0, then the student may register as an M.S. candidate.

Program of study

Students admitted to the M.S. Degree Program should select a Research Advisor, from a Thesis Committee, and decide upon an area of research in the first semester. The student and Advisor should form a Committee of three (3), composed of the Advisor, one other graduate faculty member of the Department, and a third member with graduate faculty status in another department. The second Committee member will serve as Co-Advisor, if the Advisor does not have primary appointment in the Department of Microbiology and Immunology. The Department Chair may serve as an ex-officio member of the Thesis Committees.

Students in the M.S. Program are required to submit and defend a thesis. The thesis must conform to the Graduate School's Guidelines. Students, with the consent of the Departmental Graduate Faculty Committee, may elect to substitute a written research proposal instead of a traditional thesis, based on laboratory research performed by the student, describing successive research to be pursued. The final oral defense will be preceded by a research seminar open to everyone. The oral examination will be administered by the Thesis Committee, and will be open to any other interested graduate faculty members. Evaluation of student competence and thesis acceptability, together with departmental recommendations for graduation will be forwarded to the Dean of the Graduate School.

Music (MUS)

www.louisville.edu/music/

Graduate Program Faculty

Professors
Jack Ashworth, Director of Early Music Ensemble, Distinguished Teaching Professor
Paul R. Brink
Jean Christensen, Chair - Music History
Anne Marie deZeeuw, Chair - Music Theory and Composition, Distinguished Teaching Professor
Melvin D. Dickinson
Donn Everette Graham
Karl-Werner Guempel, University Distinguished Professor
Brenda E. Kee, Chair - Keyboard/Vocal Performance
Herbert Koerselman, Dean - School of Music
Lee Luvisi, Artist-in-Residence
Peter McHugh, Chair - Instrumental Performance
Naomi Oliphant, Associate Dean, Distinguished Teaching Professor
Acton Ostling, Jr.
Steven Rouse
Frederick Speck, Director of Bands
Edith Davis Tidwell, Distinguished Teaching Professor
Michael H. Tunnell

Associate Professors
Robert A. Amchin, Interim Chair-Music Education
Kent Hatteberg, Director of Choral Activities
Bruce Heim
Marc Satterwhite

Assistant Professor
Lori Kruckenberg
Seow-Chin Ong

Emeritus/Emerita
Jerry W. Ball, Dean
Doris Owen Bickel
Ernest E. Lyon
Wesley K. Morgan
Robert Weaver

Graduate Programs

The School of Music offers training toward two specific master's degrees: Master of Music and Master of Music Education. The Doctor of Philosophy in Musicology is offered jointly with the University of Kentucky. Major subjects in the Master of Music curriculum are music performance, music history or theory composition. The Master of Music Education program allows an applied music minor in an 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 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:

- 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;
- Applicants must meet the specific entrance requirements established by the major department;
- 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 ten (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. In particular, students are advised to observe the request for submitting GRE scores for admission to the Graduate School. 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:

- The student shall obtain permission from the Graduate Division Committee to begin work at the graduate level.;
- All students must qualify as candidates for the mater's degree no later than the midterm of the second semester of full-time residence, or before fifteen (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 nine (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 bullet six (6) below.];
- The minimum amount of credit earned by the candidate in courses shall be twenty-six (26) semester hours exclusive of the thesis or any special courses preparatory for it;
- Graduate students must have a 3.0 grade point average in order to receive a master's degree in music. No more than six (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;
- Degree candidates in performance 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;
- 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;
- 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. It may cover all areas of endeavor undertaken by the student in his graduate program or believed essential to the student's background;
- 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 MM or MME from this university;
- 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

1. Bachelor of Music degree or equivalent.
2. Demonstration, by examination, of skills and capacities in the following fields: (a) written, aural, and keyboard harmony; (b) melodic, harmonic, and rhythmic dictation; sight-singing; (c) elementary counterpoint; and (d) history and literature of music, and analytic understanding of musical forms and genres.
3. Audition in major field, demonstrating a level equivalent to the completion of a Bachelor of Music in Performance 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 History Review (MUS 500)*	0	
Music Theory Review (MUS 400)*	0	
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**

Notes:

* These courses may be satisfied by passing the entrance examinations in these areas.

**The major subject requirement can be satisfied with courses in pedagogy, literature or applied study in a secondary area; additional study in the major applied field or ensembles will not meet this requirement. Piano and vocal majors should complete at total of four (4) hours of pedagogy and/or literature directly related to their applied major.

Other Requirements

Students are expected to present a public recital that comprises no less than sixty (60) 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.

Master of Music in Music Performance with concentration in Instrumental Conducting

Major: MUSP
Concentration: COND
Degree: MM
Unit: GU

Prerequisites

1. Bachelor of Music degree or equivalent.
2. Demonstration, by examination, of skills and capacities in the following fields: (a) written, aural, and keyboard harmony; (b) melodic, harmonic, and rhythmic dictation; sight-singing; (c) elementary counterpoint; and (d) history and literature of music, and analytic understanding of musical forms and genres.
3. Audition in major field, demonstrating a level equivalent to the completion of the appropriate Bachelor of Music degree.

Curriculum	Semester Hours	Total
Music History Review (MUS 500)*	0	
Music Theory Review (MUS 400)*	0	
Bibliography and Research Methods	3	
Major Applied Field (MUS 601, 602, 611)	6	
Seminar in Conducting (MUS 659, 660)	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**

Notes:

*These courses may be satisfied by passing the entrance examinations in these areas.

**To be chosen from courses in pedagogy, literature, or the student's principle applied instrument.

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.

Master of Music in Music Performance with concentration in Choral Conducting

Major: MUSP
Concentration: COND
Degree: MM
Unit: GU

Prerequisites

1. Bachelor of Music degree or equivalent.
2. Demonstration, by examination, of skills and capacities in the following fields: (a) written, aural, and keyboard harmony; (b) melodic, harmonic, and rhythmic dictation; sight-singing; (c) elementary counterpoint; and (d) history and literature of music, and analytic understanding of musical forms and genres.
3. 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 History Review (MUS 500)*	0	
Music Theory Review (MUS 400)*	0	
Bibliography and Research Methods	3	
Major Applied Field (MUS 601, 602, 611)	6	
Seminar in Conducting (MUS 659, 660)	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**

Notes:

* These courses may be satisfied by passing the entrance examinations in these areas.

** To be chosen from courses in pedagogy, literature, or the student's principle applied instrument.

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.

Master of Music Performance with concentration in Jazz

Major: MUSP
Concentration: JAZZ
Degree: MM
Unit: GU

Prerequisites

1. Bachelor of Music degree or equivalent.
2. Demonstration, by examination, of skills and capacities in the following fields: (a) written, aural, and keyboard harmony; (b) melodic, harmonic, and rhythmic dictation; sight-singing; (c) elementary counterpoint; and (d) history and literature of music, and analytic understanding of musical forms and genres.
3. Audition in major field, demonstrating a level equivalent to the completion of the appropriate Bachelor of Music degree and competence in improvisation and jazz keyboard. Refer to the Audition Requirement Page for specific details.

Curriculum	Semester Hours	Total
Music History Review (MUS 500)*	0	
Music Theory Review (MUS 400)*	0	
Major Applied Field (MUS 605, 606, 615, 616)[1]	8	
Bibliography and Research Methods (MUS 607)	3	
Music History (600-level)	3	
Music Theory (500 or 600-level to include Jazz Theory MUS 539-02)	4	
Advanced Jazz Improvisation (MUS 655)	2	
Standard Jazz Repertoire (MUS 539-03)	2	
Jazz Style and Analysis (MUS 539-01)	2	
Concentration Electives **	4	
Music Electives ***	2	
Recital	0	
Minimum Total		**30**

Notes:

[1] Students whose focus is composition/arranging may substitute four (4) hours of jazz arranging.

* These courses may be satisfied by passing the entrance examinations in these areas.

** Electives in the concentration to be chosen from Jazz Arranging, Film Scoring (MUS 656, 657), Music Industry I, II (MUS 553, 554), Computers in Music I, II (MUS 553, 554).

***For Music Electives, students are encouraged to choose courses in pedagogy and literature.

Other Requirements

Students must participate in one (1) jazz ensemble and one (1) jazz combo each semester.

Master of Music in Music Performance with concentration in Piano Pedagogy

Major: MUSP
Concentration: PPED
Degree: MM
Unit: GU

Prerequisites

1. Bachelor of Music degree or equivalent.
2. Demonstration, by examination, of skills and capacities in the following fields: (a) written, aural, and keyboard harmony; (b) melodic, harmonic, and rhythmic dictation; sight-singing; (c) elementary counterpoint; and (d) history and literature of music, and analytic understanding of musical forms and genres.
3. Audition in major field, demonstrating a level equivalent to the completion of the appropriate Bachelor of Music in Performance or Piano Pedagogy degree.

Curriculum	Semester Hours	Total
Music History Review (MUS 500)*	0	
Music Theory Review (MUS 400)*	0	
Music Bibliography and Research Methods (MUS 607)	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**

Notes:

* These courses may be satisfied by passing the entrance examinations in these areas.

** The major subject requirement may be satisfied with courss in pedagogy, literture, or applied study in a secondary area; additional study in the major applied field or ensembles will not meet this requirement.

Other Requirements

Students must participate in one (1) jazz ensemble and one (1) jazz combo each semester.

Master of Music in Music History and Literature or Theory and Composition

Major: MUHM or MUST
Degree: MM
Unit: GU

Prerequisites

1. Bachelor of Music degree or equivalent.
2. Demonstration, by examination, of skills and capacities in the following fields: (a) written, aural, and keyboard harmony; (b) melodic, harmonic, and rhythmic dictation; sight-singing; (c) elementary counterpoint; and (d) history and literature of music, and analytic understanding of musical forms and genres.
3. Evidence of preparation for advanced work in the area, as follows:

- Applicants for the degree of Music history must submit a paper to the Department of Music History demonstrating ability to write efficiently and to do elementary research. In addition, applicants must complete the entrance examination in Music History with an average score of seventy (70) for admission to the Music History curriculum. Before admission to candidacy, students in Music History are required to have a 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.
- Applicants to the degree in Theory and Composition must submit original works to indicate ability and technical facility in the field of composition. Students should also have a thorough and practical knowledge of piano as well as a thorough knowledge in the areas of string, brass, and woodwind instruments.

Curriculum	Semester Hours	Total
Music History Review (MUS 500)*	0	
Music Theory Review (MUS 400)*	0	
Music Bibliography and Research Methods (MUS 607)	3	
Music History Seminars (600-level)**	3-6	
Analysis (MUS 647, 648, 651, or 653)	3	
Seminar in Special or historical Topics in Theory (MUS 553 or 691)	3	
Thesis	4	16-19
Music Theory and Composition Track		
Advanced Private Composition	6	
Theory	2	
Applied Music (including conducting)	2	
Electives	4	
Minimum Total		**30**
Music History and Literature Track		
Music History Seminars (two 600-level)	6	
Applied Music (at the major or minor level, including conducting)	4	
Electives	4	14
Minimum Total		**30**
Honors Track in Music History and Literature		
Music History Seminar (600-level)	3	
Applied Music (at the major or minor level including conducting)	4	
Seminars in a Humanities Cognate Area (500 or 600-level)	6	
Electives	4	17
Minimum Total		**36**

Notes:

* These courses may be satisfied by passing the entrance examinations in these areas.

** Students in the Honors Track in Music History and Literature will take two music history seminars in the core curriculum.

Other Requirements

All full-time students are required to participate in an ensemble each semester; the part-time students must complete one semester of ensemble for each fifteen (15) credits earned. For students in the Music History and Literature Track, the required ensemble is the Early Music or New Music Ensemble; students in the Theory and Composition Track will choose ensembles in consultation with the advisor and departmental faculty. Credit earned for ensemble participation is not applicable to the graduate degree.

Master of Music Education

Major: MUED
Degree: MME
Unit: GU

Prerequisites

1. B.M.Ed. degree or equivalent.
2. Classroom teaching experience (prior to, or concurrent with, graduate study and exclusive of practice teaching).
3. Demonstration, by examination, of skills and capacities in the following fields: (a) written, aural, and keyboard harmony; (b) melodic, harmonic, and rhythmic dictation; sight-singing; (c) elementary counterpoint; and (d) history and literature of music, and analytic understanding of musical forms and genres.

Curriculum	Semester Hours	Total
Music History Review (MUS 500)*	0	
Music Theory Review (MUS 400)*	0	
Music Bibliography and Research Methods (MUS 607)	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 (500 or 600-level)	3-6	
Thesis**	4	
Minimum Total		**30**

Notes:

* These courses may be satisfied by passing the entrance examinations in these areas.

** 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, Grades P-12)

Major: EDMU
Degree: MAT
Unit: GE

Prerequisites

1. Admission to Graduate School
2. Admission to Teacher Education
3. Completion of Learning Theory and Human Growth and Development (ECPY 607) and Exploring Teaching Within the Socio-Cultural Context of P-12 Schools (EDTL 502/602).
4. Successful musical audition
5. PRAXIS must be taken prior to admission to the MAT Program.

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	
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	
Minimum Total		**30**

Notes:

* These courses may be satisfied by passing the entrance examinations in these areas.

Other Requirements

PRAXIS Exam must be passed for certification and conferral of the MAT degree in Music Education. Passing all KDE-required PRAXIS subtests is necessary for certification and graduation.

Doctor of Philosophy

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.

Prerequisite for Admission

1. 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 then forward copies to the Director of Graduate Studies, School of Music, University of Kentucky.
2. Master of Music or Master of Arts in Music or Music History, Bachelor of Music (or equivalent).
3. Demonstration, by examination, of skills and capacities in the following fields: (a) written, aural, and keyboard harmony; (b) melodic, harmonic, and rhythmic dictation; sight-singing; (c) elementary counterpoint; and (d) history and literature of music, and analytic understanding of musical 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 nine (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.

Foreign 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 I: 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 II: 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 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 semester 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 (nine 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.

Nursing (NURS)

www.louisville.edu/nursing

Graduate Program Faculty

Professors
Paulette Adams
Ruth B. Craddock, Emerita
Linda H. Freeman
Marianne Hutti
Mary H. Mundt, Dean, School of Nursing
Kay T. Roberts
Karen Robinson
Sally P. Weinrich

Associate Professors
Carla Hermann
Cynthia Logsdon
Rosalie O. Mainous
Cynthia McCurren, Associate Dean for Academic Affairs
Deborah L. Scott

Assistant Professors
Vicki Hines-Martin
Barbara Speck
Deborah Thomas
Cathy Bays

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.

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 six weeks 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 an accreditated 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. Graduate Record Examination (GRE) scores.
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 (without restrictions) 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. (on-line at www.graduate.louisville.edu)

Students who do not meet admission requirements may be considered for admission in Conditional status. Applications will not be considered for Full or Conditional Degree status until all materials are obtained.

Students may enroll in a non-degree status. Application credentials must include the Graduate School Application including the $25 fee and an undergraduate transcript showing the completion of the baccalaureate program in nursing. 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.

Curriculum for MSN
The MSN requires a minimum of 45 semester hours, which may be completed in full-time or part-time study (with full-time study, a student can complete the degree in two calendar years). 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 clinical track component. The majority of MSN courses are offered in a weekend format.

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 629 Neonatal Advanced Health Assessment	**3**	
NURS 657 Interventions for Health Promotion	3	
NURS 698 Research Project	2	
or NURS 699 Thesis	5	
PEDI 851 Genetics**	1	32-36

Advanced Nursing Practice Component:
(one of the following areas)

NURS 615 Advanced Clinical Practice: Women's Health NP
(includes 560 clinical hours)
615-51 (4)
615-52 (5)
615-53 (4) 13

NURS 623 Advanced Clinical Practice Adult CNS
(includes 500 clinical hours)
623-51 (6)
623-52 (7) 13

NURS 625 Advanced Clinical Practice: Adult NP
(includes 560 clinical hours)
N625-51 (4)
N625-52 (5)
N625-53 (4) 13

NURS 635 Clinical Management: Neonatal NP
635-51 (4)
635-52 (3)
635-53 (3) 10

NURS 636 High Risk Clinical: Neonatal NP
(includes 600 clinical hours) 1-8

NURS 645 Advanced Clinical Practice:
Psychiatric Mental Health CNS
(includes 532 clinical hours)
645-51 (6)
645-52 (7) 13

NURS 665 Advanced Clinical Practice: Gerontology NP
(includes 560 clinical hours)
665-51 (4)
665-52 (5)
665-53 (4)
(Not accepting new students until Fall 2003)

Advanced Clinical Practice: Family Nurse Practitioner
(includes 812 clinical hours)
Taught collaboratively with the University of Kentucky College of Nursing

NURS 725 (UK) (3)
NURS 660 (1)
NURS 726 (3)
NURS 661 (3)
NURS 662 (2)
NURS 727 (UK) (2)
NURS 663 (6)

Minimum Total 45-56

* Basic pathophysiology knowledge and physical/health assessment skills are necessary for successful progression in Advanced Pathphysiology 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 course for Neonatal NP track. Credit hours are subject to change. Based on current course offerings.

*** Core courses for Psychiatric Mental Health Clinical Specialist who do not take NURS 655.

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 for post-master's study. These options are designed to prepare individuals to be eligible for the certification examinations for nurse practitioners or for Clinical Nurse Specialists.

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 (without restrictions) in Kentucky (submit copy of license).
4. Two letters of recommendation which address academic and professional competence.
5. Completion of Applicant Data Sheet (available at Office of Student Services School of Nursing).
6. Personal interview with faculty may be required.
7. Completed UofL Graduate School application (including $25 application fee) .

Successful completion of the following courses meets the basic requirements for the practitioner examinations for Adult, Family, Gerontology, and Women's Health:

	Semester Hours	Total
Advanced Nursing: NP		
NURS 653 Advanced Practice Roles	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	
Family Nurse Practitioner (includes 812 clinical hours)	20	
Total		**25-32**

* 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: Neonatal NP		
PHAR 650 Advanced Nursing Pharmacology	3	
NURS 653 Advanced Practice Roles	3	
PEDI 851 Genetics	1	7
Advanced Clinical Practice		
NURS 629 Neonatal Advanced Health Assessment	3	21
NURS 635/NURS 636 (includes 600 clinical hours)	18	
Total		**28**

Students interested in the Adult or Psychiatric Mental Health CNS track must successfully complete the following courses:

	Semester Hours	Total
Advanced Nursing: CNS		
NURS 647 Clinical Decision Making: Psychopathology (Psychiatric- Mental Health track)	3	
NURS 649 Clinical Psychopharmacology (Psychiatric- Mental Health track)	1	
NURS 653 Advanced Practice Roles	3	
NURS 655 Pathophysiology for Clinical Decision Making (Adult Track)	3	
NURS 656 Advanced Clinical Assessment (includes 42 hours clinical)	3	
PHAR 650 Advanced Nursing Pharmacology	3	12-13
Advanced Clinical Practice		
NURS 645 Advanced Clinical Practice: Adult Psychiatric Mental Health CNS (includes 532 clinical hours)	13	13
NURS 623 Advanced Clinical Practice: Adult CNS (includes 500 clinical hours)	13	
Minimum Total		**25-26**

Oral Biology (OBIO)

www.dental.louisville.edu/dental/html/postdoc_msoralbio.htm

Graduate Program Faculty

Director
John Firriolo, Associate Professor

Professors
Harold E. Boyer
Norbert J. Burzynski
David V. Cohn
Gary A. Crim, Assistant Dean
Ronald J. Doyle
Connie L. Drisko, Assistant Dean
Allan G. Farman
Lawrence Gettleman
Allan Gould
Robert M. Green
Henry Greenwell
Bruce Haskell
B. Edwin Johnson
Zafrulla Khan
Richard L. Miller
Frederick M. Parkins
James P. Scheetz
Robert H. Staat
Arthur Van Stewart
John N. Williams, Dean
William W. Young

Associate Professor
Janice M. Butters
Douglas S. Darling
Paul D. Eleazer
Sven-Ulrik Gorr
Margaret Hill
Regan L. Moore
Abbas Parsian
Michelle L. Pisano
William Scarfe
Anibal M. Silveira

Assistant Professor
Paul F. Nugent
Frederick J. Regennitter

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 developing craniofacial region, clinical studies and biomechanics associated with dental sciences. Students obtain the scientific knowledge and biomedical skills required to perform contemporary dental research.

Areas for research training include: molecular,cellular and craniofacial biology; craniomaxillofacial diagnostic imaging; neural crest-related craniofacial and cardiovascular disorders; biochemistry of calcium-regulating hormones; regulation of gene transcription; oral microbiology; cellular mechanisms of salivary gland secretion; gene mapping of complex traits and birth defects; infection control; protein glycosylation; protein expression and trafficking; periodontology; dental materials science; orthodontics; endodontics; prosthodontics; and health services research related to dentistry.

Master of Science in Oral Biology

Major: **OBIO**
Degree: **MS**
Unit: **GD**

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.

Other course work may be required as individualized programs are developed by students working with their thesis advisor/director 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. degree in oral biology offers training particularly important to persons wishing to pursue a career in academic dentistry. The program is available to students wishing to obtain only the M.S. degree, to students enrolled in Dental Specialty Certificate/ Residency Programs, students enrolled in the D.M.D. degree program, and persons who have previously earned a D.M.D. or M.D. (or equivalent) degree.

Admissions Requirements

Transcripts and Grade Point Average

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 and/or professional degree studies completed must be furnished at the time of application. All University of Louisville transcripts will automatically be submitted with the application.

M.S. degree in oral biology program applicants should have attained an overall grade point average (GPA) of 3.0 (on a 4-point scale) or higher attained during undergraduate education, and during graduate education (e.g., Dental School), if applicable. Individuals with a GPA between 2.75 and 3.0 may be accepted on a conditional basis, and will be considered as "on probation", as described by the University of Louisville Graduate School catalog.This means that if they do not receive a GPA of 3.0 or greater during their first semester, they may be subject to dismissal. No student with a GPA less than 2.75 will be admitted to this program.

Recommendations

At least two recent, favorable letters of recommendation from individuals who can speak to the applicant's academic and/or professional capabilities and potential for study in the M.S. in oral biology degree program are required. (Letters of recommendation to other programs, e.g., Dental School, dental specialty residency programs, are not acceptable).

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, KY 40292. Applicants applying for non-degree or visitor status are not required to submit test scores. The M.S. degree in oral biology program requires the applicant's GRE scores to be greater than the 50th percentile for the Analytic and Quantitative sections of the examination.

Alternatively, an applicant may submit their Part I-National Dental Board Examinations scores in place of the GRE. The student's National Dental Board Examination scores may be acceptable to the program if the average of their Part I scores is 80 or higher, and they received a passing score on all sections of the examination.

Students enrolled in the D.M.D. degree program who are applying to the M.S. degree in oral biology program, and have not yet taken Part I of the National Dental Board Examination, may substitute their Dental Aptitude Test (DAT) test scores. The student's DAT scores may be acceptable to the program if they scored at or above the national average in test category #8 (Academic Average).

International Students

International student applications 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.

Pan-African Studies (PAS)

www.louisville.edu/a-s/pas

Graduate Program Faculty

Chair
J. Blaine Hudson, Associate Professor

Professor
Robert L. Douglas

Associate Professor
Lateef O. Badru
Susan J. Herlin
B. Folasade Iyun
Yvonne Jones

The Pan-African Studies Department 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.

The Graduate Certificate in Pan-African Studies

Admission

Admission to the graduate certificate in Pan-African Studies is open, potentially, to any student who has completed at a minimum. Post-baccalaureate students wishing to pursue the certificate outside the framework of a graduate degree program must apply for admission through and meet the general requirements for admission to the Graduate School. These requirements include the submission of:

- an official transcript reflecting previous degrees earned;
- at least two letters of recommendation; and
- scores on the General Test Section of the Graduate Record Examination.

If resource limitations necessitate the imposition of restrictions, the PAS Graduate Programs Committee will select students based on the following criteria: 1) undergraduate record; 2) letters of recommendation; 3) personal interview; and 4) GRE scores.

Graduate students wishing to pursue the certificate program in Pan-African Studies in conjunction with a graduate degree must meet the requirements for admission to that degree program and should then apply for the certificate program by consulting the PAS Director of Graduate Studies after admission. Depending on the structure of the degree program, coursework toward the certificate may be either additional hours beyond those required for the degree or elective hours toward the degree, or a combination of the two. The PAS Director of Graduate Studies shall then inform the student's degree program chair and work to coordinate the completion of degree and graduate certificate program requirements.

Exceptions

Exceptions to these standards are not anticipated. However, a "Graduate Programs Committee" (comprised of three PAS faculty, one representative from the College of Education and Human Development and one from another Arts and Sciences department) will be responsible for dealing with exceptional cases as they arise.

Responsibility

The Department of Pan-African Studies Director of Graduate Studies will review and evaluate each applicant's qualifications for admission and make recommendations to the Chair. The Graduate Programs Committee referenced above will be convened only to review exceptional cases.

Requirements for the Graduate Certificate in Pan-African Studies

1. A total of fifteen (15) hours in courses approved for graduate credit in accordance with the policies of the Graduate School.
2. Nine (9) credit hours must be chosen from the list of "Approved PAS Courses" (available in the Department of Pan-African Studies): three (3) credit hours from the "Historical Studies" area; three (3) credit hours from the "Cultural Studies" area; and three (3) credit hours from the "Social Studies" area. Substitutions must be approved by the Director of Graduate Studies.
3. Six (6) credit hours must be chosen from the list of "Approved Electives" (available in the Department of Pan-African Studies"). For students pursuing graduate degrees, at least one course must be outside of the department in which the student is pursuing the degree. Substitutions must be approved by the Director of Graduate Studies.
4. At least three hours must be at the 600 level.
5. A single course may satisfy more than one of these requirements.
6. Course work toward the graduate certificate in Pan-African Studies may also count toward the student's graduate degree.

Note: Students may not apply 500-level courses taken for undergraduate credit.

Pharmacology and Toxicology (PHTX)

www.louisville.edu/medschool/pharmacology/

Graduate Program Faculty

Professor and Chair
David W. Hein, Peter K. Knoefel Professor - Molecular pharmacogenetics; molecular epidemiology; genetic predisposition to cancer and drug toxicity; functional genomics; molecular genetics; environmental toxicology.

Professor and Graduate Program Director
William M. Pierce, Jr. - Mechanisms of bone formation and resorption; design of novel drugs for management of osteoporosis; biomolecular mass; spectrometry; proteomics instructural biology.

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.
John Eaton - Oxidation/Reduction Mechanisms in toxicity with disease with emphasis on carnogenic and metastatic mechanisms.
Paul N. Epstein - Molucular mechanisms of diabetogenesis. The use of transgenic animals to study genetics and molecular mechanisms vivo.
David Gozal - Signal transduction mechanisms underlying ventilatory response to hypoxia; neuronal adaptions to intermittent hypoxia; growth factors, intracellular signaling, and genomic implications.
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.
Y. James Kang - Molecular and Cardiac Toxicology; transgenic and knock out animal models to study oxidative injury and antioxidant assistance in the heart; biological functions and toxilogical significance of metallothionein and glutathione and vivo.
Craig J. McClain - University distinguished chair in heptology. Role of cytokines in liver injury and other forms of hypotoxcity and other interactions between nutrition and toxicology.
Donald M. Miller - Structural biology DNA in gene expression and carcinogenesis.
Frederick N. Miller - Macromolecular permeability in the microcirculation.
Donald E. Nerland - Biochemical toxicology; metabolism of drugs and environmental pollutants.
George C. Rodgers, Jr. - 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 in biomarker studies.

Associate Professors
W. Glenn McGregor - Molecular biology of DNA damage, repair and mutagenesis; molecular mechanisms of mutagenesis induced by model carcinogens; molecular mechanisms of replication of DNA templates containing well-defined site specific damage.
Steven R. Myers - Drug metabolism, metabolism of xenobiotics and chemical carcinogens; use of hemoglobin as a biomarker in exposure to xenobiotics.
M. Michele Pisano - Molecular development toxicology; gene environment interactions in normal and abnormal embryonic development; growth factor directed cellular signal transduction in embryonic cell growth and differentiation.
J. Christopher States - Molecular biology and molecular genetics of DNA damage and repair in humans.

Assistant Professors
Evelyne Gozal - Signal transduction pathways involved in neuronal cell survival and neuronal cell death during hypoxia; cellular mechanisms underlying brain adaptation to chronic and intermittent hypoxia; identification of the kinases and transcription factors activated by hypoxia, leading to gene induction and to adaptation to oxygen deprivation.
Zhao-Hui (Joe) Song - Molecular pharmacology; cloning and functional characterization of novel G protein-coupled receptors; molecular mechanisms of action and structure-function relationships of cannabinoid (marijuana) receptors.

Associates
Aruni Bhatnagar - cardiovascular effects of oxidative stress. Role of livid peroxidation in myocardial schema injury and atherosclerosis.
Michael E. Brier - Mathematical modeling in pharmacokintics and drug disposition.
Harvey L. Edmonds
James E. Jumblatt
Avital Schurr - Hypoxic mechanisms in central nervous system injury and methods for protection.

Emeritus/Emerita
Rose Dagirmanjian
Charles H. Jarboe
Thomas G. Scharff
William J. Waddell
Tom J. Zimmerman

Doctor of Philosophy in Pharmacology and Toxicology

Major: PHTX
Degree: PHD
Unit: GM

General Information

These guidelines represent the policies of the Department of Pharmacology and Toxicology regarding the doctoral (Ph.D.) program. The doctoral program is administered by the Graduate Committee consisting of the Graduate Program Director, three additional faculty members elected by the faculty, and a doctoral candidate selected by the graduate students. This committee is responsible for reviewing the progress of the students, administering the monthly qualifying exams and recommending changes in the programs for approval by the faculty. In addition, the Department Chairman, the Graduate committee, and all members of the faculty are available to assist students in their progress towards successful completion of the Ph.D. degree and in obtaining outstanding research positions following graduation.

A copy of these guidelines will be given to all students upon arrival and following any changes. Students are expected to read and be familiar with all of the policies and requirements outlined herein. These guidelines are not meant to supersede the academic policies of the University as outlined in the Graduate Catalog. Students are expected to familiarize themselves with the Graduate Catalog, the policies on academic standing, the statement of student ethics, and the requirements for obtaining graduate degrees at the University of Louisville.

Many students will matriculate into the Pharmacology and Toxicology graduate program through the School of Medicine's Integrated Programs in the Biomedical Sciences (IPIBS) gateway. The Pharmacology and Toxicology graduate program is designed to facilitate matriculation from the IPIBS gateway. Some students may wish to apply for the genetics and molecular medicine track within the pharmacology and toxicology graduate program. This track, for which fellowship support is available from the Center for Genetics and Molecular Medicine, requires that the student take Advanced Eukaryotic Genets (BIOC 641; 4 credits) in addition to the other required courses.

Student Financial Support

Students accepted into the Ph.D. program will be considered for financial aid. Since all Ph.D. students and candidates are considered to be full-time students, they generally are not permitted to seek outside employment while enrolled in the doctoral program. In cases where financial aid is limited and additional support is essential, students needing outside employment must apply in writing for departmental faculty approval. The faculty must also approve any change in employment, as well as approving continued outside employment on an annual basis.

Laboratory Research and Selection of Advisor

Students in the Ph.D. program receive training in both the classroom and laboratory. It is most important that students begin work in the laboratory as soon as possible. During the summer of the first year, incoming students attend an orientation program to introduce them to the facilities and the research activities of the faculty. During this time, each student will choose or be assigned to participate in a research laboratory, although this may not be the laboratory in which the dissertation research is completed.

During the first semester, students will take a research methods course designed to familiarize them with basic pharmacological research techniques and practices. During the first quarter, students also will meet more formally with those faculty members of the department with whom the student may wish to work. Students will participate in laboratory rotations in order to familiarize themselves with a variety of possible research projects and faculty mentors. Students will receive a letter grade for their research effort and performance every semester prior to becoming a doctoral candidate.

As soon as possible, but no later than the end of the first year, students must select Graduate Research Advisors. Early selection of research projects and advisors will permit students to spend a maximum amount of time pursuing their research goals and thus shorten the time required for completion of their dissertation research. The selections of the graduate advisors must be approved by the Graduate Committee. Students are expected to begin working diligently in the laboratory of their research advisors as soon as the selections are made. Although students normally remain in the laboratories of these advisors for all Ph.D. training, if it is decided by either an individual student or his/her advisor that a change of research advisors is desirable, then the student has the option of selecting a new research advisor with the approval of the Graduate Committee.

Selection of Dissertation Committee

Once an advisor has been selected and the research project is underway, the advisor in consultation with the student will submit to the Graduate Committee names of five faculty members willing to serve on the student's Dissertation Committee. Since this dissertation committee must approve the student's research proposal, the committee should be appointed as soon as possible. Committees must be approved by the Graduate Committee, the Chair of the Department and the Dean of the Graduate School.

Course

Students will normally complete all of the required courses for graduation during the first two years of study. The required courses are listed below, and the normal schedule for taking these courses is outlined in the timetable at the end of these guidelines. Any changes to this schedule must be approved in advance by the Graduate Committee.

Required Courses

PHTX 665, Research Methods in Pharmacology and Toxicology
BIOC 645, 647, Biochemistry I and II
PHTX 605, 606, Systemic Physiology I and II
PHTX 660, Principles of Drug and Chemical Action
PHTX 661, Molecular Mechanisms of Drug Action
PHTX 667, Advanced Cell Biology
PHY 668, Molecular Biology
PHTX 601, Principles of Medical Pharmacology
PHTX 606, Pharmacology and Toxicology Seminar
PHTX 619, Research in Pharmacology and Toxicology

In addition to these required courses, a variety of electives are offered by this and other departments, which may be taken with the permission of the student's research advisor.

Seminars and Research Conferences

All students are expected to attend departmental seminars, research conferences and journal clubs and will register for PHTX 606 (Pharmacology Seminar, one hour credit) each semester. Students will also give one presentation per year. Following these presentations, students will be given written evaluations which will be discussed with them by a member of the departmental Seminar Committee. Doctoral candidates will normally have meetings with their Dissertation Committees following their annual seminars in which their accomplishments and progress towards the Ph.D. degree will be discussed. All students are expected to participate actively in the questions and discussion following seminars. Students will receive grades based both on their individual presentations as well as their participation in the other departmental seminars.

Qualifying Exams

Beginning in June after the first year of study, Ph.D. students will begin taking a series of monthly Qualifying Exams, formulated by the faculty members of the department and administered by the Graduate Committee. Each exam will be designed to assess the ability of students to apply their knowledge to various research situations. Student responses to the question(s) will be graded on a 0-4 scale as follows:

0 - <2 unacceptable
2 - <3 acceptable
3 - 4 outstanding

A student will continue taking these exams until he or she has accumulated 24 points or until they have completed all 12 exams. Each student must accumulate at least 24 points in the twelve-month period or be subject to dismissal from the Ph.D. program.

Evaluation of Student's Progress toward the Ph.D. Degree

At the end of every semester, the progress of each Ph.D. student will be evaluated by the departmental faculty. Ph.D. students are expected to maintain a GPA of at least 3.0, satisfactory research performance, active participation in department activities and seminars, and acceptable performance on the Qualifying Exams (for second year students). Students who receive grades of C or below in two or more courses will be considered for dismissal. Students must also maintain a satisfactory level of research performance in order to retain their research assistantship.

NIH Grant and Research Progress Reports

As part of the doctoral training program, students must complete and submit to their Dissertation Committees and the departmental faculty a dissertation research proposal in the form of an NIH grant application. A copy will be placed in the departmental office. After faculty and committee members have had at least two weeks to read the student's grant application, the proposal will be presented and defended by the student during a scheduled seminar period. The student's dissertation committee must give written approval of the proposal prior to advancement to candidacy.

The NIH grant application may be submitted at any time during the second year of study, but normally will be submitted before May 1 and presented by May 15. One hour of Independent Study credit will be given during the Spring semester of the second year for work on the grant application, and a grade will be assigned for the quality of the application.

Doctoral Candidacy

After successful completion of all required course work, successful completion of the qualifying exams (accumulation of 24 points), approval of the NIH grant application, and acceptable performance in the laboratory, a student will become a Doctoral Candidate. At this time, the student will also submit a Masters' Thesis approved by his or her committee following a successful defense contemporaneous with the defense of the NIH research grant proposal. At such time, the Department will also recommend to the Dean of the Graduate School that the student be awarded the M.S. degree by the University. The M.S. degree and doctoral candidacy should normally be achieved no later than the summer following the second year. The remaining requirement is to demonstrate to the student's Dissertation Committee his/her ability to plan, conduct, analyze, and present original research.

Each year of candidacy, students will present updates of their research progress at regularly scheduled departmental seminars. Student Dissertation Committees must provide annual written certification of satisfactory progress toward the Ph.D. Failure to make satisfactory progress towards the Ph.D. degree, documented by unsatisfactory reports from the student's Dissertation Committee, is grounds for dismissal from the program.

Dissertation

The writing and defense of a doctoral dissertation is the final requirement for the Ph.D. degree. Dissertation committee members must have had at least two weeks to read a student's dissertation before a defense can be scheduled. The dissertation must present data of sufficient quality and quantity so as to convince the Dissertation Committee that the student possesses the ability to pursue independent and original research. The student must defend the research protocol, results, and conclusions at an oral dissertation defense. To satisfactorily pass the dissertation defense, a student may not receive more than one unfavorable vote from a member of the Dissertation Committee. Upon passing the dissertation defense, the department will recommend to the Dean of the Graduate School that the Doctor of Philosophy be awarded to the student by the University of Louisville.

Typical Course Schedule and Timetable

FIRST YEAR:
Summer Semester
Orientation

Fall Semester
PHTX 665, Research Methods in Pharmacology and Toxicology (3)
BIOC 645, Advanced Biochemistry I (4)
PHY 605, Systemic Physiology I (3)
PHTX 619, Research in Pharmacology and Toxicology (2)
PHTX 606, Seminar in Pharmacology and Toxicology (1)
(Select research advisor)
SEMESTER TOTAL = 13 credit hours

Spring Semester
BIOC 645, Biochemistry II (4)
PHY 606, Systemic Physiology II (3)
BIOC 667, Advanced Cell Biology (3)
PHTX 606, Seminar in Pharmacology and Toxicology (1)
PHTX 619, Research in Pharmacology and Toxicology (2)
(Appoint Dissertation Committee)
SEMESTER TOTAL = 13

SECOND YEAR
Summer Semester
Full-time research towards Ph.D. degree (6)
(Begin Qualifying Exams)
SEMESTER TOTAL = 6

Fall Semester
PHTX 660, Principles of Drug and Chemical Action (2)
BIOC 668, Molecular Biology (4)
PHTX 606, Seminar in Pharmacology and Toxicology (1)
PHTX 619, Research in Pharmacology and Toxicology (4)
(Continue Qualifying Exams)
SEMESTER TOTAL = 11

Spring Semester
Medical Pharmacology (7)
Molecular Mechanisms of Drug Action (2)
Research in Pharmacology and Toxicology (4)
Independent Study (NIH grant) (1)
Complete Monthly Qualifying Exams
Submission of NIH grant (by May 1)
Seminar presentation of NIH grant (1)
Approval of Doctoral Candidacy and award of M.S. degree
SEMESTER TOTAL = 15

PROGRAM TOTAL = 58

THIRD AND FOURTH YEARS:
Full-time laboratory research
Register as Doctoral Candidate
Seminar (annual research presentations and Dissertation Committee meetings)

FINAL YEAR:
Complete and submit Doctoral Dissertation
Dissertation defense
Award of Ph.D. degree at University graduation ceremony

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 from other backgrounds may make up some limited deficiencies in the early part of the program.

Important admissions materials include and undergraduate transcript, description of any relevant research experience, three letters of recommendation, GRE examination scores, TOEFL scores (if English is a second language), and a letter describing personal and professional goals of applicant.

Students may select a program which is directed toward pharmacology or toward toxicology. A new specialty track with a concentration in genetics/molecular medicine is also available. Since program requirements have many similarities, 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. For the PhD and Laboratory Research track MS degrees, the remainder of the program is spent in original scientific research. For the academic research track MS degree, the research portion of the program may include laboratory research, clinical research, scientific literature research, or some combination of theses.

General Information

These guidelines represent the policies of the Department of Pharmacology and Toxicology regarding the Masters (M.S.) program. The graduate program of the Department is administered by a Graduate Committee consisting of the Graduate Program Director, three additional faculty members elected by the faculty, and a doctoral candidate selected by the graduate students. This committee is responsible for reviewing the progress of the students and recommending changes in the Masters program for approval by the faculty. In addition, the Department Chairman, the Graduate Committee, and all members of the faculty are available to assist students in their progress towards successful completion of the M.S. degree.

A copy of these guidelines will be given to every entering masters candidate upon arrival. Each student is expected to read and be familiar with all of the policies and requirements outline herein. These guidelines are not meant to supersede the academic policies of the University as outlined in the Graduate Catalog. Students are expected to familiarize themselves with the Graduate Catalog, the policies on academic standing, the statement of student ethics, and the requirements for obtaining graduate degrees at the University of Louisville.

Masters Track

Two tracks are available to students interested in obtaining the M.S. degree in the Department of Pharmacology and Toxicology. These are the M.S. - Laboratory Research Track (Track 1), and the M.S. -Academic Research Track (Track 2). The M.S. - Laboratory Research Track requires that the student work extensively in a research laboratory under the direction of a faculty Research Advisor throughout the two-years of matriculation. During the summer of the first year, incoming students in this track of the Masters Program will attend an orientation program to introduce them to the various laboratories and research activities of the faculty. During this time, but not later than the end of the Fall semester, each student must choose (or will be assigned) a Research Advisor under whose direction and in whose laboratory the research project will be conducted. Students in Track 1 of the Masters program are expected to begin working diligently in the laboratory of the advisor as soon as the selection is made. Students will register and receive a grade for laboratory research every semester. Students who successfully complete the M.S. degree in the Laboratory Research track could be considered for advanced standing into the Ph.D. program, usually at the level of Doctoral Candidacy, pending submission of an N.I.H. grant proposal and successful completion of a written qualifying examination.

The M.S.-Academic Research Track, while not requiring extensive laboratory work, requires the student to research an area of pharmacological or toxicological importance under the direction of a faculty advisor. This research must result in the generation of a comprehensive treatise which reviews, critically analyzes and assimilates a body of knowledge into a Masters thesis approved by the student's Thesis Committee. Students in Track 2 of the Masters program are expected to begin working diligently on this project as soon as they have chosen the faculty advisor and research topic. Students will register and receive a grade for work on their research project every semester. Students who obtain the M.S. degree in the Academic Research Track will normally not have attained sufficient laboratory experience to be admitted to advanced standing in the Ph.D. program.

Research Advisor

As indicated above, as soon as possible, but no later than the end of the first semester, each student must select (or be assigned) a Research Advisor with whom the student will conduct their laboratory or academic research project. Early selection of the advisor and research project will permit the student to complete sufficient work to obtain the Masters degree within the usual two-year period. Although this advisor will normally be the faculty member with whom the student completes the M.S. degree, if it is decided by either the student or the advisor that a change of advisors is desirable, then the student has the option of selecting a new research advisor, with the approval of the Graduate Committee, although this may delay achieving the M.S. degree within the expected two-year period.

Once an advisor has been selected and the research project is underway, the advisor in consultation with the student will submit to the Graduate Committee the names of three faculty members willing to serve on the student's Thesis Committee. Since this committee must approve the students research project, this committee should be appointed as soon as possible.

Course Work

Each student in the Masters program is expected to complete all of the required courses for graduation during the first two years of study. The required courses are listed below, and the schedule for taking these courses is outlined in the timetable at the end of these guidelines. Some of the courses may be exempted with the approval of the Graduate Committee if the student provides convincing evidence of an adequate background in the subject area. Any change to the normal schedule of courses must be approved in advance by the Graduate Committee.

Required Courses

PHTX 665, Research Methods in Pharmacology and Toxicology
BIOC 645, 647, Biochemistry I and II
PHY 605, 606, Systemic Physiology I and II
PHTX 660, Principles of drug and Chemical Action
BIOC 668, Molecular Biology
PHTX 601, Principles of Medical Pharmacology
PHTX 606, Pharmacology and Toxicology Seminar
PHTX 619, Research in Pharmacology and Toxicology

Seminars and Research Committees

All students are expected to attend departmental seminars, research conferences and journal clubs and will register for PHTX 606 (Pharmacology Seminar, one hour credit) each semester. All students are expected to participate actively in the discussion following each seminar. Students will receive a grade at the end of the year based both on their attendance and participation.

Evaluation of Student's Progress toward the M.S. Degree

At the end of every semester, the progress of each masters student will be evaluated by the departmental faculty. Students are expected to maintain a GPA of 3.0, have actively participated in department activities and seminars, and to have demonstrated satisfactory progress on their research project each semester. Students who receive a grade of C or below in two or more courses will be considered for dismissal.

Master's Thesis

Each student in the M.S. Program will be required to write and defend a Master's Thesis. The thesis must be a work of sufficient quality to convince the Thesis Committee that the student possesses the ability to either participate actively in a laboratory environment or to contribute significantly as an academician in the broad discipline of pharmacology and toxicology. Each student must present and defend their Masters Thesis at an oral thesis defense. To satisfactorily pass the thesis defense, a student may not receive more than one unfavorable vote from a member of the Thesis Committee.

After successful completion of all required course work and the successful defense of their thesis, the Department will recommend to the Dean of the Graduate School that the degree of Master of Science be awarded to the student by the University of Louisville.

Typical Course Schedule and Timetable

FIRST YEAR:
Summer Semester:
Orientation

Fall Semester
PHTX 665, Research Methods in Pharmacology and Toxicology (3)
BIOC 645, Biochemistry I (4)
PHY 605, Systemic Physiology I (3)
PHTX 619, Research in Pharmacology and Toxicology (2)
PHTX 606, Seminar in Pharmacology and Toxicology (1)
(Select research advisor)
Semester Total = 13

Spring Semester
BIOC 645, Biochemistry II (4)
PHY 606, Systemic Physiology II (3)
PHTX 667, Seminar in Pharmacology and Toxicology (1)
PHTX 619, Research in Pharmacology and Toxicology (3)
(Appoint Thesis Committee)
Semester Total = 11

SECOND YEAR:
Summer Semester
Full-time research towards M.S. degree (6)
Semester Total = 6

Fall Semester
PHTX 660, Principles of Drug and Chemical Action (2)
BIOC 668, Molecular Biology (4)
PHTX 606, Seminar in Pharmacology and Toxicology (1)
PHTX 619, Research in Pharmacology and Toxicology (4)
Semester Total = 11

Spring Semester
PHTX 601, Principles of Medical Pharmacology (7)
PHTX 619, Research in Pharmacology and Toxicology (4)
(Write and defend Masters Thesis)
Semester Total = 11

PROGRAM TOTAL = 52

Further information regarding the Department and the graduate programs is available at the Department of Pharmacology and Toxicology website.

Physics (PHYS)

www.physics.louisville.edu

Graduate Program 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
David N. Brown
John C. Morrison
W. Karl Pitts

Assistant Professors
Shudun Liu

Adjunct Professors
Peter Almond
U.K. Henner

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 (PHY)

www.louisville.edu/medschool/physiology

Graduate Program 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
Frederick N. Miller - microcirculation: permeability
John C. Passmore - renovascular physiology
Richard W. Stremel - angiogenesis and dynamic skeletal muscle function
David L. Wiegman, Vice Dean for Academic Affairs, Medical School and Associate Vice President for Health Affairs

Associate Professors
Ayotunde S. O. Adeagbo - endothelial factors and vascular control
Gary L. Anderson - microvascular disorders associated with reconstructive surgery
Stanley E. D'Souza - cell adhesion molecules
John T. Fleming - microcirculation: diabetes, bone
Peipei Ping - protein kinase C (PKC) dependent signaling mechanisms in the heart
Andrew M. Roberts - cardiopulmonary system: pulmonary microcirculation control
William B. Wead - microcirculation, cardiac performance, and cardiopulmonary interaction

Assistant Professors
Jeff C. Falcone - microvascular regulation of blood flow and Ca2+ imaging and hypertension and aging

Emeritus/Emerita
James C. Moore
X. J. Musacchia
Sheppard M. Walker

Master of Science in Physiology and Biophysics

Major: PHY
Degree: MS
Unit: GM

Programs

The Department of Physiology and Biophysics is located in the Health Sciences Center of the University of Louisville, which provides an active and intellectually stimulating environment, a wide variety of course options and a good teaching experience. The graduate program permits studies in other related disciplines, such as anatomy, neurobiology, pharmacology, biochemistry, microbiology, immunology, molecular biology, physics, mathematics and engineering sciences.

Our Graduate Program offers a Master of Science to provide several career options: 1) to develop competence in directed research for advanced technical positions in industry, government, and university medical research laboratories; 2) to prepare students with good general knowledge of human physiology to enable them to communicate physiological concepts to future students; and 3) to explore the possibility of a future career as an independent scientist in medically-related research.

The typical Master of Science (M.S.) Graduate Program includes a directed research emphasis and consists of thirty-six (36) semester hours typically over a twenty-four month (4 semester) period to include the following: 8 credit hours of basic medical sciences, 6 credit hours of advanced physiology topics and at least 9 credit hours of directed physiological research.

I. ADMISSION

A. Application Procedures

The University of Louisville Graduate School catalog gives a general description about admission procedures. The following application items must be submitted to the Director of Graduate Admissions in the Department of Physiology and Biophysics (www.louisville.edu/medschool/physiology) and through that Department to the Admissions Office at the University of Louisville.

- One official transcript of the applicant's previous course work for each college or university that has been attended,
- Two letters of recommendation from people who are well acquainted with the applicant's previous work,
- Analytical, Verbal and Quantitative scores from the Graduate Record Examination (GRE) or its equivalent,
- TOEFL examination scores from foreign applicants from a non-English speaking country,
- A non-returnable application fee paid to the University of Louisville, and
- A written statement (one typed double-spaced page) stating the applicant's personal background and current career interests

B. Admission Requirements

- A cumulative undergraduate grade point average that is usually 2.80 or higher on a scale of 4.0 (A=4, B=3, etc.),
- A Graduate Record Examination Score which usually averages at the 40th percentile or higher in the verbal, quanititative and analytical sections. Satisfactory MCAT scores will also be accepted in lieu of the GRE,
- In the case of a foreign applicant from a non-English speaking country, the applicant must achieve a TOEFL Examination score of 550 (paper) or 213 (computerized).

C. Graduate Admissions Committee (GAC)

The Departmental Graduate Admissions Committee shall consist of the Director of Graduate Admissions, who is appointed by the Departmental Chair and two other Departmental faculty members who are elected by the Departmental faculty for a three-year term.

D. Procedures For Determining Admissions

1. The Director of GAC will obtain and summarize the applicant's credentials (Form 1).
2. The GAC will review the application items and will determine if the student's qualifications warrant a Departmental interview. If so, the applicant's credentials will be distributed to Departmental faculty and associates with mentoring privileges. Interviews will be arranged by the Director of Graduate Admissions. The applicant will be interviewed by:
   - One member of the GAC.
   - The Department Chair or the Chair's designee.
   - Other interested faculty members.

   If the applicant cannot come for an interview, then consideration of the application will proceed without the interview, or in some cases, by telephone interview.
3. The GAC will submit the applicant's credentials to the full-time Departmental faculty for a vote. Ballots will not be distributed to Department Associates.
4. Applicants will be admitted into the Program with affirmative votes from 2/3 of the full-time Departmental faculty (i.e., full-time faculty with primary appointment in the Department) and if at least one Departmental faculty member or a least one Departmental associate with mentoring privileges has agreed to serve as mentor.
5. When an applicant is accepted into the Master of Science Program, the Department Chair will send an official letter of acceptance. The successful applicant must submit a letter indicating their intent to enroll in the Program. If the applicant is not admitted into the Program, the Chair of the GAO will communicate those results to the applicant.
6. A Departmental file will be established for each student matriculating into the Department. The file will include (a) copy of the application, (b) a copy of all transcripts and GRE scores, (c) a copy of all letters of recommendation, (d) a copy of Form 1 (Graduate Admission Summary Form), (e) a copy of the Departmental notification of admission, (f) a copy of the Graduate School notification of admission, and (g) a copy of the written acceptance by the student. These documents will be transmitted to the Departmental Director of Graduate Studies by the Director of Graduate Admissions after the student arrives to begin training in the Department.

III. MINIMAL REQUIREMENTS FOR THE MASTER'S DEGREE

A. Advisory System

A full-time Graduate Faculty member of the department or an associate with mentoring privileges will be selected to be the Principal Advisor by the student, with approval of the Departmental Director of Graduate Studies and the Department Chair. The selection of a mentor must be made prior to registration for the second semester. In cases where the Principal Advisor holds a primary appointment in a department other than the Department of Physiology and Biophysics, one of the Departmental faculty Committee members must be selected as Co-Advisor by the Principal Advisor and the student. The Principal Advisor will have responsibility for determining the required program of academic studies for the degree of Master of Science with minimal requirements as defined below.

B. Minimum Program Requirements

At least 36 semester hours beyond the Baccalaureate Degree are required for the degree of Master of Science. A maximum of 12 semester hours of the total 36 semester hours may be credited from post-baccalaureate work in other professional or graduate degree programs.

C. Minimum Course Requirements

The M.S. Program must include the following courses taken on a grade basis:

Courses	Credit Hours
Biochemistry (BIOC 645, 647) or equivalent	8
Research (PHY 619)	9
Systemic Physiology I and II (PHY 605 and 606)	6

Credit can be given for one or more courses if the applicant has taken the course prior to admission to the Department and received a grade of "B" or better.

D. Academic Performance

A student must have at least a 3.0 accumulated GPA exclusive of research credit to be graduated with a degree of Master of Science in Physiology and Biophysics. In general, a student with a GPA less than 3.0 at the end of the second semester will require a 2/3 majority vote of the Departmental faculty to continue in the Program. A grade of "B" or better must be obtained in the Systemic Physiology courses.

E. Final Examination

The student will take a Final Examination during the last semester of the M.S. Program. The Final Examination shall consist of a written and/or oral presentation of the completed research.This exam may take the form of an oral presentation of an authored manuscript, a detailed review of a selected topic or an examination demonstrating the student's use and depth of knowledge of physiology (doctoral qualifying examination).

A positive recommendation for the Master of Science shall require a majority vote of the Final Examination Committee (consisting of at least the Principal Advisor who will serve as Chair and two additional members of the Graduate Faculty, one of whom is from outside the Department). The Committee must have been approved by Director of Graduate Studies, the Department Chair, and the Dean of the Graduate School prior to the Final Examination. This recommendation shall be made to the Dean of the Graduate School at least one week before graduation.

In the event of an unfavorable vote of the Final Examination Committee, the student may be considered for re-examination only by a recommendation of a 2/3 majority of the Departmental faculty.

Doctor of Philosophy in Physiology and Biophysics

Major: PHY
Degree: PhD
Unit: GM

The Department of Physiology and Biophysics is located in the Health Sciences Center of the University of Louisville, which provides an active and intellectually stimulating environment, a wide variety of course options and a good teaching experience. The graduate program permits studies in other related disciplines, such as anatomy, neurobiology, pharmacology, biochemistry, microbiology, immunology, molecular biology, physics, mathematics and engineering sciences.

The doctoral program of the Department of Physiology and Biophysics is offered through the Graduate School of the University of Louisville. As such, one major goal of the Department is to provide students with advanced training which leads to the Ph.D. Degree in Physiology and Biophysics. The research interests of the Department are broad enough to provide each student with a wide selection of possible research and graduate education opportunities. The doctoral graduate program is designed primarly to prepare students for a research career in basic and applied physiology.

I. ADMISSION

A. Application Procedures

The University of Louisville Graduate School catalog gives a general description of admission procedures. The following application items must be submitted to the Director of Graduate Admissions in the Department of Physiology and Biophysics (www.louisville.edu/medschool/physiology) and through the Department to the Admissions Office at the University of Louisville.

1. One official transcript of the applicant's previous work for each college or university that has been previously attended,
2. Two letters of recommendation from people who are well acquainted with the applicant's previous academic work,
3. Applicant's must forward the scores from the Analytical, Verbal and Quantitative portions of the Graduate Record Examination (GRE). In the case of students with professional degrees (for example, M.D., D.D.S. or D.V.M.) the aptitude test taken for admission into that professional program or National Board scores may be substituted for the GRE approval by the Departmental Graduate Admissions Committee and the Department Chair.
4. TOEFL examinations scores for foreign students from non-English speaking countries,
5. A non-returnable application fee to the University of Louisville,
6. Applicants must state in a letter to the Department of Physiology and Biophysics, why they desire a Ph.D. degree in this Department.
7. Applicants for combined degrees (Ph.D./M.D., or Ph.D./D.M.D.) must apply and be accepted by the appropriate professional school (e.g., School of Medicine or Dentistry) before final action will be taken on the Deparmental doctoral application.

B. Admission Requirements

Admission to the Department of Physiology and Biophysics requires:

- A genuine interest in graduate work and the desire for a significant research career in the health sciences,
- A cumulative undergraduate grade point average that is usually 3.00 or higher on a scale of 4.0 (A=4, B=3, C=2, D=1),
- A graduate record exam score (or equivalent) which is usually 50th percentile or higher as an average of the verbal, quantitative, and analytical sections, and in addition.
- A foreign applicant from a non-English speaking country must achieve a TOEFL Examination score of at least 550 (paper) or 213 (computerized).

C. Admission Procedures

The Graduate Admission Committee (GAC) evaluates all requests for admission into the Program. The GAC consists of the Director of Graduate Admissions who is appointed by the Department Chair and two other Departmental faculty for three year terms. The GAC will determine if the student's qualifications warrant a Departmental interview. If so, interviews will be arranged by the Director of Graduate Admissions. The applicant will be interviewed by at least:

- One member of the GAC
- The Departmental Chair or the Chair's designated representative
- Three other members of the Departmental faculty

If the applicant cannot come for an interview, then consideration of the application will proceed without the interview, or in some cases, by telephone interview.

The GAC report to the faculty shall consist of: a) the narrative evaluations by each of the faculty interviewers, b) the Graduate School Admissions Summary (Form 1), and c) the completed application file. The report on the applicant will be submitted to the Departmental faculty for their action. An applicant will not be admitted to graduate studies in physiology without affirmative votes from at least 2/3 of the Departmental full-time graduate faculty. When an appointment is accepted into the Program, the Department Chair will send a letter of acceptance. The Chair's letter will also indicate if a stipend and/or tuition remission support will be awarded.

The prospective student must provide a letter indicating their intent to enroll in the Program. A Departmental file will be established for the entering student. The initial file materials will be copies of (a) the application, (b) all transcripts and GRE scores, (c) all letters of recommendation, (d) all faculty evaluations, (e) Form 1, (f) the Departmental notification of admission, (g) the Graduate School notification of admission, and (h) the written acceptance by the student. These documents will normally be placed in the Departmental files by the Departmental Directory of Graduate Admissions after the student has submitted a written acceptance.

II. FACULTY ADVISING

A. First Year Temporary Advisor and Research Experience

The Director of Graduate Student Advising will meet with the new student to discuss the student's academic and research interests. The Director of Graduate Student Advising will serve as a Temporary Advisor until a Permanent Advisor is selected. With the approval of the Department Chair, the new student will be assigned by the Director of Graduate Studies, to the laboratory of a Departmental full-time faculty member for at least eight weeks. During this time, the student will provide 20 hours per week of research assistance to the laboratory. The faculty member may opt to have the student provide this research assistance in the laboratory of an associate with mentoring privileges. The purpose of this assignment is to give the student an immediate opportunity for research experience.

B. Selection of Principal Advisor

Beginning with the first semester as a graduate student, each student will begin rotations in research laboratories. These rotations will be coordinated by the Directory of Graduate Studies and continue in other laboratories until a Principal Advisor is selected.

First-year students with advanced degrees (D.M.D., D.V.M., M.D. or equivalent) will be allowed to undergo rotations immediately upon matriculation and may select a Principal Advisor in the first semester of study. In both cases, the selection process involves approval by the student, the Principal Advisor, the Director of Graduate Student Advising, and the Department Chair.

After selection of the Principal Advisor, the student's Advisory Committee (Form 2) will be determined. This Committee must have at least five members, and will include as a minimum the Principal Advisor as Chair, at least three Departmental faculty, and at least one Graduate faculty member from outside the Department. In cases where the Principal Advisor holds a primary appointment in a department other than the Department of Physiology and Biophysics, one of the Departmental faculty Committee members must be selected as Co-Advisor by the Principal Advisor and the student. Approval of the Committee membership by the Director of Graduate Studies and the Chair will be contingent upon the potential role of each Committee member in the project, in the training, or in the career plans of the student.

III. MINIMAL REQUIREMENTS FOR THE DOCTOR OF PHILOSOPHY DEGREE IN PHYSIOLOGY AND BIOPHYSICS

A. General

The Ph.D. degree is designed for the student who wishes a professional life that involves original, independent research and who desires knowledge that will permit competent advanced teaching in a physiology area. The Ph.D. degree requires that the student reach a high level of creativity and expertise. Therefore, mere competition of a prescribed number of courses is not adequate for receipt of the Doctoral degree. All Ph.D. students are expected to make steady and satisfactory progress toward the completion of the degree.

B. Minimal Program Requirements

The Ph.D. degree requires at least 72 semester hours beyond the Baccalaureate degree. A maximum of 36 semester hours of this requirement may be credited for post-baccalaureate work from other professional or graduate degree programs. A minimum of one year (24 semester hours) shall be taken in full-time residence at the University of Louisville. By the end of the program, the student must demonstrate the ability to conduct independent research.

C. Minimum Course Requirements

The required program of academic studies must include (if not completed with a grade of "B" or better prior to admission to the Department) the following courses (taken on a grade basis):

1. Systemic Physiology I and II (PHY 605 and 606), or equivalent
2. Biochemistry (BIOC 645 and 647), or equivalent
3. Advanced Physiology (PHY 611)
4. Cell Biology (MBIO 667) or equivalent
5. At least 2 additional Graduate 600+ level courses.

D. Academic Performance

A student must have at least a 3.00 accumulated GPA (on a 4.0 scale) in order to take the Ph.D. Qualifying Examination and to qualify for the Ph.D.. degree. A grade of "B" or greater must be obtained in Systemic Physiology (PHY 605 and 606) and Advanced Human Physiology (PHY 611). In general, a student with a GPA of less than 3.00 after two consecutive semesters (excluding summer sessions) will require a 2/3 majority vote of the Departmental faculty to continue in the Ph.D. Program. Grades for research work will not be included in the Departmental calculation of the student's required GPA. For Departmental purposes, pass grades will not be included in the GPA calculation; however, a fail grade in a pass/fail-graded course will be included in the GPA calculation at 0 quality points per credit hour.

E. The Ph.D. Qualifying Examination

The student must have completed C1 through C4 of the Minimum Course Requirements listed above, before the Ph.D. Qualifying Examination may be taken. It would normally be expected that the student would take the Ph.D. Qualifying Examination following two years of graduate studies (or after 36 semester hours of credit). If the student has not taken the Ph.D. Qualifying Examination by the end of the third year, a letter of justification for the delay must be submitted by the Principal Advisor to the Department Chair.

A Ph.D. Qualifying Examination must be passed by the applicant in order to be admitted to Ph.D. candidacy. The membership of the Qualifying Examination Committee will be selected by the Director of Graduate Studies from among the Department faculty and must be approved by the Department Chair and the Dean of the Graduate School. The Qualifying Examination Committee will be comprised of five members of the Departmental faculty. A recommendation of passing shall not involve more than one negative vote of this Committee. If the student does not pass the Qualifying Examination, one additional retake will be allowed if approved by a majority vote of the Departmental faculty.

The purpose of the Ph.D. Qualifying Examination is to test the student's use and depth of core physiological knowledge. This examination shall be given in two parts. The first part will be a written examination which will consist of three-hour periods on each of five consecutive weekdays. Following the last day of the written examination, the Committee will meet within one week to discuss the results of the written examination and to plan the upcoming oral examination. After this meeting, the Principal Advisor will meet with the student to report the results of the meeting and to transmit any information that the individual members of the Committee wish to provide the student concerning the orals. The oral examination will be held within one week of this advisor meeting with the student.

The student will receive the Master of Science Degree in Physiology, upon satisfactory completion of the Qualifying Exam.

F. Maintenance of Graduate Status

A candidate for the Ph.D. degree who has completed all residency requirements, all of the approved required program of academic studies, and passed the Qualifying Examination may register for "DOC 600" to maintain candidacy until the degree is awarded. Yearly progress meetings will continue to be expected. In order to be eligible to receive the Ph.D. degree, the student must have been admitted to candidacy no later than the end of the ninth month prior to the awarding of the degree.

G. Dissertation

The dissertation shall represent a scholarly achievement which embodies results of independent research and which demonstrates a thorough understanding of research concepts in the field of inquiry. The completed dissertation must be approved by a Reading Committee which includes the candidate's Principal Advisor, and two additional readers, one who is a member of the candidate's Advisory Committee, and one who is from outside the Department. Then, at least two weeks before the scheduled dissertation defense and at least 30 days before the expected date of graduation, the dissertation shall be submitted to a Dissertation Defense Committee (consisting of at least the Reading Committee and two additional Department faculty). the Dissertation Defense Committee, selected by the Principal Advisor, must have been approved by the Director of Graduate Studies, the Department Chair, and by the Dean of the Graduate School prior to the Final Examination. Two unbound copies of the accepted dissertation, signed by the Dissertation Defense Committee must be deposited with the Dean of the Graduate School and one copy must be given to the Department Chair before graduation.

H. Dissertation Defense

The dissertation defense is an oral defense of the dissertation and a demonstration of mastery of the candidate's research field. It is administered by the Dissertation Defense Committee. The defense of the dissertation is a public examination and the Graduate School will notify all faculty members of the Graduate School that they are invited to the Dissertation Defense, but only members of the Dissertation Defense Committee will vote on the student's performance. For the student to pass the Dissertation Defense, the vote of the Dissertation Defense Committee may not include more than one negative vote. The Dissertation Defense must take place at least 14 days before the end of the semester in which the degree is anticipated.

I. The Department will not approve the granting of the Ph.D. degree until the student has submitted at least one first-authored manuscript on the dissertation research for publication in a refereed journal. The manuscript and the choice of journal must be approved by the Principal Advisor before manuscript submission.

J. In any case where the Departmental requirements are less restrictive than those of the Graduate School, the Graduate School regulations will apply.

IV. EXCEPTIONS

A. The above are statements of minimum Departmental requirements. However, it is recognized that there could be special and unusual cases in which rare exceptions should be allowed. The student and advisor should consult with the Department Chair if an exception is desired.

B. In the above guidelines, the Director of Graduate Studies has considerable responsibility for program quality. To avoid any possibility of a potential conflict of interest, the Department Chair (or designate) will fulfill the role of Director of Graduate Studies for any Ph.D. or M.S. student who has the Director of Graduate Studies as their Principal Advisor.

TYPICAL DOCTORAL PROGRAMS

TERM	COURSE	CREDIT HOURS
First Semester		
(First Fall)	Biochemistry (BIOC) 645	3
	Systemic Physiology I (PHY 605)	3
	Seminar (PHY 617)	1
	600-Elective	3
	PHY 616 (rotations)	1

Second Semester (1st Spring)	Course	Credit Hours
	Graduate Level Biochemistry (BIOC 647)	3
	Systemic Physiology II (PHY 606)	3
	Seminar (PHY 617)	1
	600-Elective	3
	PHY 616 (rotations)	1

Third Semester (1st Summer)	Course	Credit Hours
	Research (PHY 619) OR PHY 616 (rotations)	9

Fourth Semester (2nd Fall)	Course	Credit Hours
	Advanced Human Physiology (PHY 611)	4
	600-Elective	3
	Research (PHY 619)	2
	Seminar (PHY 617)	1

Fifth Semester	Course	Credit Hours
	Research (PHY 619)	9
	Seminar (PHY 617)	1
	M.S. Final Exam (Ph.D Qualifying Exam)	

Master of Science Degree and matriculation into Ph.D. Program

Term	Course	Credit Hours
Sixth Semester		
(2nd Summer)	Research (PHY 619)	9
Seventh Semester		
(3rd Fall)	Research (PHY 619)	3
	600 Elective	3
	Seminar (PHY 617)	1
Eighth Semester		
(3rd Spring)	DOCT	
Ninth Semester		
(3rd Summer)	DOCT	
Tenth Semester		
(4th Fall)	DOCT	
Eleventh Semester		
(4th Spring)	DOCT	
	Dissertation and Defend	

If more research/dissertation time is needed, the student will continue to register as DOCT ("Active Status"), until completed.

Doctoral Program for Residents/Fellows

This sequence is based on the premise that the clinician will be given the equivalent of two full calendar years ("Research Leave") free to complete research without clinical duties.

The clinician will initially: a) Transfer preclinical curricular hours (36 credit hours), b) Take Advanced Human Physiology (4 credit hours), and c) Complete initial research (PHY 619) to define doctoral research problems.

First Semester (1st Fall)	Course	Credit Hours
	Advanced Human Physiology (611)	4
	Research (PHY 619)`	3
	600-Elective	3
	Seminar (PHY 617)	1

Second Semester (1st Spring)	Course	Credit Hours
	Seminar (PHY 617)	1
	600-Elective	3
	Research (PHY 619)	4
	Ph.D Qualifying Exam	

Master of Science Degree

Third Semester (1st Summer)	Course	Credit Hours
	Research (PHY 619)	9

Fourth Semester (2nd Fall)	Course	Credit Hours
	600-Elective	3
	Research (PHY 619)	6
	Seminar (PHY 617)	1

Fifth Semester (2nd Spring)	Course	Credit Hours
	Research (PHY 619)	9
	Seminar (PHY 617)	1

If more research/dissertation time is needed, the clinician will continue to register as DOCT ("Active Status") until completed and dissertation defense.

Political Science (POLS)

www.louisville.edu/a-s/polsci/

Graduate Program Faculty

Chair
Charles E. Ziegler, Professor

Professors
Philip G. Laemmle
Susan M. Matarese
Ronald K. Vogel
Paul J. Weber

Associate Professors
Julie M. Bunck
Dewey M. Clayton
David L. Imbroscio, Director of Graduate Studies
Rodger A. Payne
Laurie A. Rhodebeck
Nathan H. Schwartz
Okbazghi Yohannes

Assistant Professors
Mark W. Frazier

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 cataloge section 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 should 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**

Psychological and Brain Sciences (PSYC)

www.louisville.edu/a-s/psychology

Graduate Program Faculty

Chair
Dennis Molfese, Professor

Professors
Joseph F. Aponte
John C. Birkimer
Barbara M. Burns
Michael R. Cunningham
Stephen E. Edgell
Edward A. Essock
Carolyn B. Mervis
Robert G. Meyer
Stanley A. Murrell
Heywood M. Petry
Paul G. Salmon

Associate Professors
James K. Beggan
Janet W. Borden
Suzanne Meeks

Assistant Professors
Paul J. DeMarco
Zi Jiang He
Maureen A. McCall
Tamara L. Newton
John R. Pani

Emeritus/Emerita
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 Psychological and Brain Sciences.

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 Psychological and Brain Sciences.

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.

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.

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 (PADM)

http://cbpa.louisville.edu/academicprograms/mpa.htm

Graduate Program Faculty

Professors
Steven Bourassa (Urban and Public Affairs), Department Chair
Betty C. Brown (School of Accountancy)
John I. Gilderbloom (Urban and Public Affairs)
Steven Koven (Urban and Public Affairs)
Peter B. Meyer (Urban and Public Affairs)
H. V. Savitch (School of Economics and Public Affairs), Program Chair
Ronald K. Vogel (Political Science)
Paul V. Weber (Department of Political Science)

Associate Professors
Dewey Clayton (Political Science)
Carrie Donald (Urban and Public Affairs)
Thomas S. Lyons (Urban and Public Affairs)
Nathan H. Schwartz (Political Science)

Assistant Professor
Christopher Mausolff (Urban and Public Affairs)
David M. Simpson (Urban and Public Affairs)

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 three 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 Development and Environment specialization focuses on urban growth and its consequences in a geographic, social and economic context. The Labor-Public Management Relations specialization emphasizes the resolution of disputes in the workplace and the development of partnerships between labor and management.

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.

Master of Public Administration

Major: PADM
Degree: MPA
Unit: GB

	Semester Hours	Total
Core Courses		
PADM 600 Public Administration and Organizational Theory	3	
PADM 601 Statistics for Public Affairs	3	
PADM 602 Applied Research Methods	3	
PADM 603 Public Analysis and Program Evaluation	3	
PADM 604 Public Budgeting and Finance	3	
PADM 606 Public Policy	3	
PADM 642 Human Resources Management	3	
PADM 682 Practicum/Internship		
or PADM 695 Thesis	6	27
Public Policy and Administration Specialization		
Five courses (15 hours) from the following:		
PADM 605 Strategic Management and Planning	3	
PADM 607 Planning	3	
PADM 610 Administrative Law and Process	3	
PADM 611 Accounting for Public Administrators	3	
PADM 620 Intergovernmental Relations	3	
PADM 621 Politics of Urban Development	3	
PADM 623 Comparative Urban Development	3	
PADM 624 Ethics in Public Administration	3	
PADM 625 Advanced Organizational Behavior	3	
PADM 626 Community Housing Policies	3	
PADM 627 Environmental Policy	3	
PADM 640 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 Development and the Environment Specialization		
Five courses (15 hours) from the following:		
PADM 605 Strategic Management and Planning	3	
PADM 607 Planning Theory	3	
PADM 610 Administration Law and Process	3	
PADM 611 Accounting for Public Administrators	3	
PADM 620 Intergovernmental Relations	3	
PADM 621 Politics of Urban Development	3	
PADM 622 Principles of Urban Design	3	
PADM 623 Comparative Urban Development	3	
PADM 624 Ethics in Public Administration	3	
PADM 626 Community Housing Policies	3	
PADM 627 Environmental Policy	3	
PADM 628 Historic Preservation	3	
PADM 630 Environmental Policy and Natural Hazards	3	
PADM 632 Topics in Urban & Regional Planning & Development	3	
PADM 640 Urban Economics	3	
PADM 645 Economic Development	3	
PADM 648 Mediation and Dispute Resolution		
PADM 671 Topics in Public Policy	3	
PADM 680 Independent Research in Public Administration	3	
PADM 681 Independent Readings in Public Administration	3	
PADM 684 Advanced Research Methods	3	
PADM 688 Land Use and Planning Law	3	15
Labor-Public Management Relations Specialization		
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 Administration	3	
PADM 640 Urban Economics	3	
PADM 644 Collective Bargaining	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 625 Advanced Organizational Behavior	3	
PADM 671 Special Topics in Public Policy	3	
PADM 680 Independent Research in Public Administration	3	
PADM 681 Independent Readings in Public Administration	3	
PADM 684 Advanced Research Methods	3	
Minimum Total		**42**

Public Health—Biostatistics-Decision Science (PHDA)

www.louisville.edu/academic/public_health.htm

Graduate Program Faculty

Professors
Troy D. Abell, Ph.D, MPH, Director
Richard D. Clover, M.D.
Stephen W. Looney, Ph.D., Associate Director
Paul Simmons, Ph.D.

Assistant Professor
Jane Goldsmith, Ph.D.

Associates
(Faculty in other programs, departments, and schools serving as research mentors or on graduate student committee)

Lisa C. Baker, Ph.D., Assistant Professor of Pediatrics
Richard D. Blondell, M.D., Professor of Family and Community Medicine
Patricia Cerrito, Ph.D., Professor of Mathematics
Joseph D. Cole, Ph.D., Professor of Electrical and Computer Engineering
Stephen Edgell, Ph.D., Professor of Psychological and Brain Sciences
Adel S. Elmaghraby, Ph.D., Professor of Computer Engineering and Computer Science
Robert J. Esterhay, M.D., Associate Professor of Family and Community Medicine
Gerald W. Evans, Ph.D., Professor of Industrial Engineering
Carol Z. Garrison, Ph.D., Professor of Family and Community Medicine
Stephen F. Gohmann, Ph.D., Professor of Economics
Richard I. Haddy, M.D., Professor of Family and Community Medicine
Inessa Levi, Ph.D., Professor of Mathematics
W. Paul McKinney, M.D., Professor of Medicine
Kelly M. McMasters, M.D., Ph.D., Assistant Professor of Surgery
Lisa B. Markowitz, Ph.D., Assistant Professor of Anthroplogy
Peter B. Meyer, Ph.D., Professor of Urban Policy and Economics
Steven Myers, Ph.D., Associate Professor of Pharmacology and Toxicology
Julie M. Peteet, Ph.D., Associate Professor of Anthroplogy
Mark P. Pfeifer, M.D., Professor of Medicine
Greg Rempala, Ph.D., Assistant Professor of Mathematics
Mark Rothstein, J.D., Professor of Medicine
Michael J. Silvers, D.O, M.P.H., Assistant Professor of Family and Community Medicine
Prasaad Steiner, M.D., M.P.H., Ph.D., Professor of Family and Community Medicine
Howard Stone, J.D., L.L.M., Assistant Professor of Family and Community Medicine
David J. Tollerud, M.D., M.P.H., Professor of Medicine
Christine Seel Ritchie, M.D., M.S.P.H., Assistant Professor of Medicine
Peter L. Walton, M.D., Assistant Professor of Family and Community Medicine
Martin C. Weinrich, Ph.D., Professor of Medicine
Jacek M. Zurada, Ph.D., Professor of Electrical and Computer Engineering

Programs

The Department of Family and Community Medicine, through its Biostatistics-Decision Science Program, in the School of Medicine offers programs of study and investigation leading to the award of Master of Science in Public Health (MSPH) and Doctor of Philosophy (PhD) degrees. Currently a student is able to complete the MSPH in either a Biostatistics or Decision Science Concentration, with the PhD being available in the Decision Science Concentration.

Admissions

Applicants must meet the general requirements of the Graduate School as outlined in the General Information section of this catalog concerning application credentials, transcripts, GPA, recommendations, GRE scores, and TOEFL requirements. Students with a prior earned doctorate (DMD, JD, MD, PhD, etc.) may petition to have the GRE requirement waived. The Program Director and the Dean of the Graduate School will make all decisions concerning modifications to the admissions process.

In addition, students seeking the Biostatistics Concentration in the MSPH program must have completed the following courses (or their equivalent) with a grade of "C" or better prior to entering the program: Elementary Statistics (MATH 109), Calculus III (MATH 301), Introduction to Linear Algebra (MATH 325), and Program Design (Computer Engineering and Computer Science 121). Students seeking either concentration in the MSPH program who have inadequate preparation in mathematics, statistics, or computer science may be admitted conditionally. Remedial courses for those students entering the Biostatistics Concentration may be available, but these courses will not be counted toward the credit hours needed to fulfill the degree requirements.

In addition to the Graduate School admission requirements, applicants seeking the PhD degree will be required to have at least a 3.5 grade point average (out of 4.0) in any previous graduate work and a combined score of 1100 on the verbal and quantitative components of the Aptitude Test of the GRE and a combined score of 1200 on the quantitative and analytical components.

Outstanding applicants may be admitted directly to the PhD degree program in the Decision Science Concentration, complete the MPSH course work requirements, waive the masters theses, and complete the PhD requirements; such students will be awarded the MSPH and PhD simultaneously upon the successful completion of the PhD degree.

Financial Support

Financial support for graduate study currently is provided by stipends on individual research grants in the Health Sciences Center and by Institute of Public Health Research (IPHR) research assistantships.

Doctor of Philosophy in Biostatistics: Decision Science

Major: BDSC
Degree: PhD
Unit: GM

Requirements for the PhD degree in Biostatistics-Decision Science: Decision Science Concentration

1. The program is an eighty-four (84) hour program with an embedded 36 hour MSPH program (48 hours beyond the 36-hour MSPH program in Decision Science).
2. Required PhD course work (12 hours) includes: PHDA 602 Biostatistics-Decision Science Seminar (1 hr x 2 semesters= 2 hours), PHDA 673 Biostatistics-Decision Science Research (3 hours), PHDA 690 Utility Theory and Assessment (2 hours), PHDA 691 Bayesian Inference and Decision (3 hours), and PHDA 703 Advanced Economic Analysis in Decision Science (2 hours).
3. Twelve (12) credit hours of electives. The doctoral student will develop an area of specialization in consultation with and approval of the student's doctoral committee. Approved elective course work will reflect this specialization. Students may find course work in the following areas especially helpful: mathematical modeling, computation and artificial intelligence, operations research, participant observation and other qualitative approaches in anthropology, cognitive psychology, and health policy, law, and ethics.
4. Dissertation Research (24 hours). The major emphasis in the doctoral program is mentored research - training beyond accumulated course credit. Successful passage of Comprehensive Doctoral Exams makes a student a Doctoral Candidate. A doctoral candidate must successfully develop and defend a Dissertation Proposal that describes an original, independent research project. Dissertation research can be taken for up to 24 credit hours. Upon successful defense of the Dissertation, the students receives the PhD degree.

Master of Science in Public Health (MSPH) in Biostatistics-Decision Science

Major: BDSC
Degree: MSPH
Unit: GM

Requirements for the MSPH in Biostatistics-Decision Science

The MSPH in Biostatistics-Decision Science is a thirty-six (36) hour program that requires a thesis (thesis can be waived for students admitted directly into PhD program).

Core Courses	Semester Hours	Total
PHDA 605, Ethical Issues in Decision Making	2	
PHCI 611, Introduction to Public Health and Epidemiology	2	
PHCI 631, Social and Behavioral Sciences in Health Care	2	
PHCI 651, Introduction to Environmental Health	2	
PHCI 662, Health Economics	2	
PHDA 602, Biostatistics-Decision Science Seminar	1	
PHDA 603, Public Health Practicum I	1-2	
PHDA 604, Public Health Practicum II	1-2	
PHDA 661, Probability	3	
PHDA 662, Mathematical Statistics	3	19
Decision Science Concentration Requirements (beyond core)		
PHDA 660, Mathematical Tools	4	
PHDA 663, Decision Analysis	3	
Biostatistics Concentration Requirements (beyond core)		
PHDA 680, Biostatistical Methods I	3	
PHDA 681, Biostatistical Methods II	3	
Electives		
Varies by concentration (Biostatistics or Decision Science)	6-9	
Masters Thesis Research		
PHDA 666, Masters Thesis	2-4	
Minimum Total		**36**

Public Health - Epidemiology and Clinical Investigation Sciences (PHCI)

www.louisville.edu/hsc/publichealth/index.hml

Graduate Program Faculty

Dircetor
Carlton A. Hornug, Professor

Professors
Patricia B. Cerrito
Stephan F. Gohmann
Stephen W. Looney
W. Paul McKinney
David J. Tollerud
Martin C. Weinrich
Osborne P. Wiggins

Associate Professors
Robert J. Esterhay
Stephen Myers

Assistant Professors
Stephanie Ann Call
L. Jane Goldsmith
Susan E. Kelly
Barbara A. Stetson
Peter Walton

Associate Professors
Stan Goldman
W. Edward Miller

Programs

The Epidemiology-Clinical Investigation Sciences program in the School of Medicine offers a Graduate Certificate in Clinical Investigation Sciences, the Masters of Science in Public Health, and the Doctor of Philosophy (PhD) in Epidemiology-Clinical Investigation Sciences. The program is designed to train clinical research scientists.

The Graduate Certificate in Clinical Investigation Sciences is designed to provide individuals with the skills required for a career in a clinical research setting and for professionals seeking to upgrade their clinical research skills.

The Masters of Science in Public health (MSPH) is designed for health professions to acquire the clinical research skills essential for a career in an academic health center. The MSPH is a 30 credit hour program with 24 credit hours of required course work in epidemiology, biostatistics, behavioral science, the responsible conduct of health care research and the methodologies of health services and outcomes research. A six (6) credit hour thesis is required.

The combined MD-MSPH enables medical students to graduate in five years with both their medical degree and the MSPH. Students complete three years of medical school that includes basic medical science training and the first year of their clinical rotations. They then enroll in the MSPH program and complete the course work and thesis for the MSPH degree and their fourth year of medical school over the next two years.

The Doctor of Philosophy (PhD) in Epidemiology-Clinical Investigation Sciences prepares students for an independent career in patient-oriented research. Students concentrate in either Translational Research or Health Services and Outcomes Research. Both concentrations require thirty (30) credit hours of course work beyond the MSPH and an eighteen (18) credit hour dissertation.

Admission Requirements

Requirements for admission to the Graduate Certificate are a Bachelor's Degree in a health field. Students applying for admission in the MSPH or the PhD programs must have a professional degree, a recognized terminal degree in a health field, or a graduate degree with appropriate experience in health care or clinical research. Students who complete the Graduate Certificate may be admitted into the MSPH program and may apply their completed course work toward the requirements of the MSPH degree. Students applying directly to the PhD program must have an MSPH in Clinical Investigation Science or comparable training at the Master's level.

Graduate Certificate in Clinical Investigation Sciences

Major: PHCI
Degree: Graduate Certificate
Unit: GM

The Graduate Certificate requires fifteen (15) credit hours of course work and a one (1) credit hour research paper.

The course work includes:
PHCI 611, Introduction to Epidemiology and Public Health (2)
PHCI 621, Fundamentals of Biostatistics (2)
PHCI 622, Design and Analysis of Case-Control Studies (2)
PHCI 623, Design and Analysis of Cohort Studies (2)
PHCI 624, Clinical Trials I: Planning and Design (2)
PHCI 632, Ethical Conduct of Health Care Research (2)
PHCI 601, Evaluating the Health Care Literature (2)
PHCI 699, Thesis Preparation (1)

Plus one of the following:
PHCI 631, Social and Behavioral Sciences in Health Care (2)
PHCI 662, Health Care Economics (2)
PHCI 602, Health Services and Outcomes Research (2)

All course work completed in the Graduate Certificate program can be applied to the MSPH degree.

Masters of Science in Public Health

Major: PHCI
Degree: MSPH
Unit: GM

The MSPH degree requires twenty-four (24) credit hours of course work plus a six (6) credit hour thesis. Early in the first semester, students should identify a clinical research scientist and member of the graduate faculty to serve as a mentor. The required course work can be completed in three (3) semesters plus one summer. All courses required for the MSPH degree meet from 4:00p.m to 5:30p.m. Monday through Thursday.

Required Courses:
PHCI 661, Introduction to Public Health Informatics (1)
PHCI 611, Introduction to Epidemiology and Public Health (2)
PHCI 651, Introduction to Environmental Health (2)
PHCI 631, Social and Behavioral Sciences in Health Care (2)
PHCI 621, Fundamentals of Biostatistics (2)
PHCI 622, Design and Analysis of Case-Control Studies (2)
PHCI 623, Design and Analysis of Cohort Studies (2)
PHCI 624, Clinical Trials I: Planning and Design (2)
PHCI 625, Clinical Trials II: Conducting and Evaluating Clinical Trials (2)
PHCI 632, Ethical Conduct of Health Care Research (2)
PHCI 662, Health Care Economics (2)
PHCI 602, Health Services and Outcomes Research (2)
PHCI 601, Evaluating the Health Care Literature (1)
PHCI 699, Mentored Research-Thesis Preparation (6)

The Masters Thesis must conform to the Graduate School guidelines. The thesis must be approved by the student's thesis committee and defended before the faculty in accordance with the rules of the Graduate School. Students accepted to pursue the PhD degree may waive the Masters Thesis requirement with the MSPH degree awarded upon satisfactory completion of the PhD qualifying examinations.

Doctor of Philosophy in Epidemiology-Clinical Investigation Sciences

Major: PHCI
Degree: PhD
Unit: GM

The doctoral program in Epidemiology-Clinical Investigation Sciences prepares students for an independent career in patient oriented research. Students are expected to participate in research projects throughout their course of study prior to the preparation of a dissertation. The curriculum enables students to concentrate in either translational research or health services and outcomes research.

Translational Research:
Students who concentrate in translational research will be trained to be clinical scientists capable of leading all phases of the development and testing of new investigational drugs and biomedical devices from "bench to bedside". The translational research curriculum includes twenty (20) credit hours of required and ten (10) credit hours of elective course work beyond the MSPH. Elective courses should be taken from the basic biomedical sciences at the 600 level and above. Independent study courses in biomedical sciences that involve a research experience are strongly recommended.

Required Courses:
BIOC 641/BIOL 641, Advanced Eukaryotic Genetics (4)
PHCI 664, Intellectual Property Rights (1)
PHCI 665, Legal Issues in Drug/Device Development (1)
PHAR 601, Principles of Medical Pharmacology (7)
PHAR 660, Principles of Drug and Chemical Action (3)
PHCI 626, Clinical Trials III: Conducting and Evaluating Clinical Trials (2)

Health Services and Outcomes Research:
Students pursuing the health services and outcomes research concentration will be trained to conduct patient-oriented, population-based research to assess the effectiveness and efficacy of alternative health services delivery systems or treatment options and to design and/or evaluate programs to improve the health status of populations. The curriculum includes eighteen (18) credit hours of required course work and twelve (12) hours of electives beyond the Masters. Elective courses should be chosen from among the graduate level courses offered with the clinical research program or from relevant health related courses offered in other departments of the University. It is expected that a portion of elective hours will be in independent study that will include significant research experiences.

Required Courses:
PHCI 603, Program Evaluation (2)
PHCI 671, Preventive Medicine I: Community Health (2)
PHCI 672, Preventive Medicine II: Individual Health Assessment and Risk Factor Modification (2)
HADM 620, Introduction to the Business of Healthcare Systems (3)
PHCI 605, Survey Research Methods (2)
PHCI 604, Quality Assessment in Healthcare (2)

Two of the following:
PHCI 612 Epidemiology of Cardiovascular Disease (1)
PHCI 613, Epidemiology of Cancer (1)
PHCI 614, Epidemiology of Infectious Disease (1)

Three of the following:
PHCI 641, Programs and Research in maternal and Child Health (1)
PHCI 642, Programs and Research in Child Health (1)
PHCI 643, Programs and Research in Adult Health (1)
PHCI 644, Programs and Research in Geriatric Health (1)
PHCI 645, Programs and Research in Women's Health (1)
PHCI 646, Programs and Research in Minority Health (1)

Social Sciences (SS)

www.louisville.edu/a-s/soc/

Graduate Program Faculty

Chair
Wayne Usui, 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 Division.

Kent School of Social Work (SW)

www.louisville.edu/kent/

Graduate Program Faculty

Dean
Terry L. Singer

Associate Dean
Carol T. Tully

Associate Dean of Research
Riaan van Zyl

Professors
Gerard Barber
Joseph H. Brown
Dana N. Christensen
Ruth Huber, Director Doctoral Program
Thomas R. Lawson
Gale Goldberg Wood

Associate Professors
Stanley R. Frager
Suzanne Midori Hanna
Sharon Moore
Ruth Paton
Bibhuti K. Sar

Associate Professor of Research
Anita Barbee-Cunningham

Assistant Professors
Annatjie Faul
Andy Frey
Tangerine-Ann Holt
Sally St. George
Daniel P. Wulff
Pamela Yankeelov

Assistant Professors of Research
Linda Bledsoe
Mavin Martin

Master of Science in Social Work

Major: SW
Degree: MSSW
Unit: Kent School

Accreditation

The Master of Science in Social Work program is accredited by the Council on Social Work Education. The Post-Masters Certificate Family Therapy program is accredited by the Commission on Accreditation for Marriage and Family Education.

Admission to Kent School of Social Work's Masters Program

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 (502/852-6402), 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), and 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 700-1000 word autobiographical statement. Submit a carefully written personal statement (double-spaced type written pages-12 point.) that addresses the following four topics:
   (1) describe a social problem or program strategy that is of greatest interest to you;
   (2) describe your commitment to engage in social work roles that involve social welfare, institutions, and systems most likely to have an effect on major social problems;
   (3) describe in detail how you would ensure that you work is relevant to the most economically and socially disadvantaged groups in our society;
   (4) describe the intellectual and personal qualifications that will enable you to practice social work successfully.
   Note: ***If there are gaps or deficiencies in your academic record, please address these in an addendum to your statement.***
5. At least three reference forms are required and supplemental letters are encouraged. 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 3.0.
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 (must be sent on-line www.graduate.louisville.edu).
2. A $25.00 processing fee.
3. One official transcript from each institution of higher learning attended must be mailed directly to the University Office of Admissions, Department AO, UofL, Louisville, KY 40292.
4. An autobiographical statement, typewritten and signed.
5. Each applicant is required to add the following statement to their autobiographical statement accompanied by the applicant's signature and date of the signature.
   Academic dishonesty is prohibited at the University of Louisville, in keeping with this policy, I certify the material contained in this application is solely my work and I have neither cheated nor plagiarized in its creation
   Applicant's signature_____ Date_____.
6. Three references (one academic and two employment, which can include field instruction or volunteer work) must be sent directly to the University Office of Admissions, Department AO, UofL, Louisville, KY 40292.
7. Evidence of satisfactory completion (grade + course description) of statistics, research methodology, and human biology prerequisites must be submitted along with the application.
8. MAT and TOEFL scores, when applicable, must be sent directly to the University Office of Admissions, Department AO, UofL, Louisville, KY 40292. Tests may be taken at the nearest university or through the University of Louisville Testing Service.

The University Admission's 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 Kent School Admissions Committee will review the application only when all credentials are on file.

Admission Application Date

Consideration of applications begins in November. The final deadline for applications is May 15th for the following fall semester, but because entry into the program is highly competitive, applicants are encouraged to submit their applications early to ensure a space. All materials must be received before an admissions decision can be made.

Social Work Graduate Curriculum

The graduate social work curriculum is guided by the precepts of the mission of the Kent School to prepare competently trained social workers who practice from a strong professional value base to serve the metropolitan mission of the University. This education is directed to engage learning that develops skills and understanding in practice with individuals, families, and communities and to promote social justice. This foundation year of the curriculum prepares student for generalist practice within the context of a structural approach to social work. The advanced or concentration year provides two avenues of concentration for students to develop specialized skills and knowledge. Students choose one of these two options; either one in advanced direct practice or one in advanced macro practice.

Foundation Curriculum

The foundation year of study prepares students for generalist practice with multi-level systems; individuals, families, groups, organizations, and communities. It is built upon a liberal arts base that provides students with a perspective that society is a complex organization of diverse people and ideas, each of which includes strengths upon which society may prosper and grow.The Kent School approaches foundational learning through the lens of a structural model of practice that is based on an awareness of systematic inequalities in the distribution of society's resources. It further purports a belief in distributive justice that holds as primary each person's need for and right to a fair share of the benefits of society. Students who complete this first year of study will be able to assess social problems in a multi-dimensional framework that allows them to create strategies for intervening in complex problem-solving at various levels of systems and that builds upon the strengths inherent in those systems.

Concentration Curriculum

In the advanced year of the curriculum, students may elect to enroll in a concentration of either advanced direct practice or advanced macro practice. Each concentration develops on the strength of the liberal arts base and foundational generalist perspective from the first year of the curriculum. Both of these practice concentrations take a social constructionist perspective, particularly the idea that there are multiple realities, and that these realities are socially constructed. In each of these concentrations, students enroll concurrently in a designated practice course and a field practicum assignment that parallels the practice interests of the concentration. In addition, advanced research courses provide the student with additional skills in measuring practice of effectiveness at this advanced level of practice.

Advanced Direct Practice

The advanced direct practice curriculum emphasizes the interrelatedness of environmental conditions and individual, family, and group dynamics as they relate to personal, interpersonal, and social problems. The populations specifically targeted by this approach transect all socio-economic classes; however, special attention is given to high-risk client populations. Various models are examined with appropriate intervention modalities. Psychosocial and structural theory are emphasized with respective intervention techniques and skills. Advanced direct practice provides content related to smaller systems such as individuals, families, and is guided by a narrative framework. Narrative social work practice is neither pathology-based, nor victim-blaming, and operates from the assumption that there are many ways to interpret lived experience. The Kent School Advanced Direct Practitioner understands the profound role of power in all human relationships, the role of history in creating meaning, that negotiated meanings influence the actions available to us, and maintains respect for the diverse lives and experiences of clients.

Advanced Macro Practice

The growing complexity and cost of contemporary social welfare services demand able administrators, social planners, and policy analysis. These professionals must be skilled in modern management, policy analysis, and strategic planning techniques, and be capable of monitoring and evaluating the impact of social policies, programs, and services. Administration, policy, and planning methods include those areas of professional social work practice commonly referred to as agency administration, management, and staff development; policy analysis; program design, implementation and evaluation; organizational development; and community planning and organization. The courses emphasize development of strategies and skills for effective practice in the roles of health and welfare planner and developer, program consultant, policy analyst, middle manager, supervisor, staff trainer, program director, and grass-roots organizer. The advanced macro practice curriculum is directed at organizational systems and seeks to provide specialized knowledge and skills that increase students' abilities to work with contemporary problems, issues and practices in the administration of human service delivery systems. Management and critical analysis skills are honed in content related to policy development and organizational effectiveness. Multiple realities as reflected in a competing values paradigm, that affect organizational life parallel the process of smaller system intervention. In that regard, advanced macro practice prepares students to understand organizational complexity and to develop effective administrative tools to manage service delivery.

Tansfer of Credit

Students may transfer up to 30 credits of coursework from graduate programs accredited by (or in candidacy) the Council on Social Work Education. The Director of Student Affairs/Admissions will establish course equivalency for courses transferred and may consult with faculty where areas of comparability are in question. Only courses taken within the last five years and with grades of “B” or better will be considered. No credit will be given for previous work or life experience.

Electives

The Kent School of Social Work provides electives as enrichment to the specialized learning in the concentration year. Social work jobs call for skills and knowledge that are broader than any narrowly defined specialization. For example, mental health workers are asked to know psychopathology, substance abuse, managed care, AIDS, and a range of other substantive areas. Many school social workers share the need for the same content. In addition, it is noted that social workers frequently change jobs, often to another field of practice. Social work education seeks to teach students to think critically, analyze systematically, and know where to find information and resources within the context of social work history, development and values. It is this type of education that best prepares students to function in a rapidly changing society.

In this curriculum paradigm, electives are considered enrichment. Some of this enrichment is in the form of very specific course content that aligns with a concentration. For example, a person in a direct practice concentration may elect to take a course in psychopathology to prepare for work in a mental health center or private practice. In another case, the enrichment may take the form of a complementary course such as a direct practice student taking a management course to prepare for career possibilities or the administrative student taking a course in family intervention to understand the complexities of family practice. Or, the enrichment may take the form of exploration as in the case of the student taking an aging or child welfare course to better understand those fields of practice and to prepare for various job prospects. Finally, the enrichment may include a course of general interest such as a women's issues course which crosses numerous concentration lines, but may not correspond specifically to the direct focus of the advanced practice.

Students are eligible to take electives anytime following completion of the foundation, or at a minimum, after completing two human behavior courses, two social policy courses and the human diversity course. This coursework forms the basis of understanding social work concepts sufficiently to generate enrichment interest. Students are discouraged from taking practice-focused electives until completing generalist practice courses or at least taking such coursework concurrently.

Curriculum Modules

60 Credit Hour Curriculum
(all courses are 3 credit hours each)

Foundation Groundwork
601 Life Span & Human Development
619 Human Transactions in the Social Environment
602 Social Welfare Institutions, Policies, and Services
622 Issues in Policy & Service Delivery
603 Human Diversity
604 Social Work Practice I
605 Social Work Practice II
670 Practicum I (16 clock hours per week)
671 Practicum II (16 clock hours per week)
672 Research Methodology and Design

Advanced Coursework (pre-requisite all Foundation courses)
640 Adv Direct Practice I or 691 Adv Macro Practice I
641 Adv Direct Practice II or 692 Adv Macro Practice I
668 Adv Research Practice I
669 Adv Research Practice II
672 Adv Practicum III (16 clock hours per week)
673 Adv Practicum IV (16 clock hours per week)
Electives (4 electives are required - 12 credit hours)

30 Credit Hour Curriculum
Applies to Advanced Standing Placement ONLY
(Students admitted with BSW)
(all courses are 3 credit hours each)

Advanced Coursework
640 Adv Direct Practice I or 691 Adv Macro Practice I
641 Adv Direct Practice II or 692 Adv Macro Practice II
668 Adv Research Practice I
669 Adv Research Practice II
672 Adv Practicum III (16 clock hours per week)
673 Adv Practicum IV (16 clock hours per week)
Electives (4 electives are required - 12 credit hours)

Family Therapy Program

The Family Therapy Program is located within the Raymond A. Kent School of Social Work. This program is dedicated to the study of Marriage and Family Therapy (MFT) at the Masters and Post-Masters levels. Completion of all program requirements prepare students of licensure (LMFT) in the Commonwealth of Kentucky and clinical membership within the American Association for Marriage and Family Therapy (AAMFT). The program requires coursework and supervised clinical practice. Coursework focuses on the theoretical foundations and practical applications of marriage and family therapy, therapist's ethical responsibility, and integration of research and practice. At the Masters level, the Family Therapy Program offers the MSSW-MFT specialization and at the Post-Masters level, Post-Masters Certificate in MFT.

MSSW-MFT Specialization

The MSSW-MFT specialization offers the opportunity for those pursuing their Masters degree in Social Work to specialize in clinical practice with families in the context of their communities. The Specialization fulfills its mission by combining the systematic foundational principles of Marriage and Family Therapy with the goals and values of Social Work. This specialization deliberately prepares students to utilize family therapy with those families who are disadvantaged and/or typically undeserved.

The MSSW-MFT specialization is integrated within the Kent School Masters curriculum. The MSSW-MFT specialization requires eleven (11) hours in addition to the sixty (60) hours required for the Masters Degree in Social Work. These additional hours are accumulated through two additional courses and five semester hours of MFT supervision concurrent with Social Work Practica.

This specialization has been awarded candidacy status for national accreditation through the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE).

Application materials for the MSSW-MFT Specialization should be included with the application materials required by the Graduate School and the Kent School of Social Work. Consideration for admission into the specialization is dependent upon acceptance into the Kent School's MSSW program.

Post-Masters Certificate in MFT

The Post-Masters Certificate in MFT offers the opportunity for those who already hold a Masters Degree in a Human Services field to pursue advanced study and supervised practice in Marriage and Family Therapy. Prerequisites for entry into this program may be required depending upon the student Masters Program.

This Certificate Program is designed for the student to complete the requirements in two (2) calendar years, a new cohort of students beginning in the summer semester each year. Requirements include six (6) courses concurrent with five hundred (500) hours of supervised clinical practice and one hundred (100) hours of approved supervision in cooperation with Family and Children's Counseling Centers.

The Post-Masters Certificate in MFT has been accredited since 1991 by COAMFTE.

Application materials for the Post-Master's Certificate in MFT should be included with the application materials required by the Graduate School of the University of Louisville. Deadline for completed applications is February 1. Consideration for admission into the certificate program is dependent upon acceptance into the Graduate School.

Doctor of Philosophy in Social Work

Major: SW
Degree: PhD
Unit: GK

The Commonwealth's first doctoral program in social work offers the opportunity for academically motivated master's level social workers to continue their studies at the doctoral level. Graduates will be prepared to serve as 1) faculty members in social work programs in Kentucky colleges and universities and institutions nationally, or 2) administrators, planners, policy analysts, and program evaluators in a broad range of social service agencies.

Application

Prospective students should apply to the institution where they plan to matriculate. The combined University of Louisville/University of Kentucky (UL/UK) program faculty will make admission recommendations to the prospective Deans of Graduate Schools.

To apply to the doctoral program in Social Work through the University of Louisville, send the following materials by February 1 to:

Ruth Huber, Ph.D., Director
Ph.D. Program in Social Work
Kent School of Social Work
University of Louisville
Louisville, KY 40292

1. Completed Graduate School Application (on-line at www.graduate.louisville.edu).
2. Application for Admission to the UL/UK Ph.D. in Social Work Program
3. Official transcripts from each college/university attended, and documentation of the receipt of a Master's Degree in Social Work, e.g. MSW, MSSW
4. Official report of GRE scores
5. Three recommendations from the Graduate School Application (at least two from academicians)
6. Application fee of $25 (unless you are a Kent graduate)
7. A current resume
8. A sample of scholarly or professional writing
9. A personal statement of career goals, research interests, and reasons for pursuing doctoral studies (no more than 3 pages)

The admission process involves the following:

1) Review of application materials by the doctoral admissions committee, 2) admission committee interviews with those recommended, 3) review by the combined UL/UK admission committee, and 4) review by the Graduate School of the university where the candidate plans to matriculate.

Admission Requirements

Those with master's degrees in social work will be considered for admission.

Doctoral 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, or a total of at least 62 credit hours. The curriculum consists of three components:

I. Core Curriculum (29 credit hours): These are required courses that include research, statistics, theory development, policy analysis and behavior change theories, ethics, teaching in social work, and professional seminars.

II. Individualized Plan of Study (at least 15 credit hours): these credit hours are devoted to students' individual interests in areas in which expertise is to be developed.

III. Dissertation (at least 18 credits): 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.

Qualifying Examination

The purpose of the qualifying examination is to provide a vehicle through which students can demonstrate their abilities to integrate the whole of their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge base of social work. A student is eligible to take the qualifying examinations upon successful completion of 44 credits of core and other course work. Students are expected to provide answers that integrate knowledge from all required courses. Following the passage of the qualifying examination, students are admitted to Candidacy Status.

Dissertation

After admission to candidacy, students proceed to propose, complete, and defend their dissertations. The dissertation must represent independent research and should be based on original research questions or hypotheses. Dissertation committees have at least five members, one of whom is from the sister institution. Otherwise, the program at each university follows the policies and procedures of the respective institutions regarding the formation and membership of dissertation committees.

Core Curriculum	Semester Hours	Total
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 and II	3	
Statistics for Social Work I and II	3	
Professional Seminar I and II	2	9
Individualized Plan of Study (15 credit hours)		
Research	3	
Twelve credit hours of coursework in an area of scholarly study	12	15
Dissertation Credit Hours (two full-time semesters)	**18**	**18**
Minimum Total		**62**

Sociology (SOC)

www.louisville.edu/a-s/soc/

Graduate Program Faculty

Chair
Wayne M. Usui, Professor

Professors
Jon H. Rieger
J. Allen Whitt
Associate Professors
D. Mark Austin
Lateef O. Badru
John A. Busch
Melissa Evans-Andris
Patricia Gagné
Cynthia Negrey

Assistant Professor
Allen Furr
Susan E. Kelly
Shawn L. Schwaner

Emeritus/Emerita
Badr-El-Din Ali
James E. DeBurger
K. Robert Durig

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 15.

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's Graduate Advisor.

5 Year BA-BS/MA 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 MA. 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.

Master of Arts in Sociology with concentration in Pan-African Studies

Major: SOC
Degree: MA
Unit: GS

	Semester Hours	Total
Core Curriculum (13 hours)		
SOC 510, computer Data Analysis	3	
SOC 604, Proseminar in Sociology	1	
SOC 610, Seminar in Social Statistics	3	
SOC 615, Seminar in Research Methodology	3	
SOC 620, Seminar in Sociological Theory	3	
Restricted Electives (12 hours)		
Select at least nine (9) hours from the following courses:		
PAS 605, Special Topics	3	
PAS 606, Independent Study	3	
PAS 614, History of Pan-African Social Thought	3	
PAS 615, Advanced Seminar on Race	3	
PAS 625, African Americans in Contemporary American Society	3	
Other 600-level courses with advisor's approval.		
Select no more than three (3) hours from the following:		
PAS 505, The Black Atlantic	3	
PAS 515, Race and Racism	3	
PAS 520, The Black Family in American Society	3	
PAS 528, History of African American Education	3	
PAS 535, History of African Americans in Kentucky	3	
PAS 586, Field Research	3	
Additional Hours:		
As with all Sociology M.A. students, the remaining hours depend on the option the student chooses, whether thesis, internship, or comprehensive examination:		
Thesis Option (31 hours total):		
SOC 600 Thesis/Internship	3	31
Internship Option (37 hours total):		
SOC 600 Thesis/Internship		
Other Sociology graduate-level electives	6	37
Comprehensive exam option (37 hours total):		
Other Sociology graduate-level electives	12	37
Minimum Total		**31-37**

Master of Arts in Sociology with a Minor in Communication

Major: SOC
Minor: COMM
Degree: MA
Unit: GA

Students earning the MA in Sociology may elect to minor in Communication.. All students must take the core courses below and then choose one of the three options (thesis, internship, or comprehensive examination) to complete the degree.

Core Courses

SOC 510 Computer Data Analysis .....3 hours
SOC 604 Proseminar in Sociology .....1 hour
SOC 610 Statistics .....3 hours
SOC 615 Research Methodology .....3 hours
SOC 620 Sociological Theory .....3 hours

Minimum Total .....13 hours

Breakdown of hours for Thesis, Internship, or Comprehensive Examination

	Thesis	Internship	Comp Exam
Communication Electives	12 hours	12 hours	15 hours
Sociology Electives*	0 hours	6 hours	9 hours**
SOC 600 (Thesis/Internship)	6 hours	6 hours	0 hours
Core Courses	13 hours	13 hours	13 hours
TOTAL	**31 hours**	**37 hours**	**37 hours**

* At least 3 of the nine hours of the Sociology electives must be 600-level.

** Six hours of courses outside Geography and Sociology may be selected with the permission of the graduate program coordinator.

Master of Arts in Sociology with a Minor in Urban Geography

Major: SOC
Minor: Urban GEOG
Degree: MA
Unit: GA

Students earning the MA in Sociology may elect to minor in Urban Geography. All students must take the core courses below and then choose one of the three options (thesis, internship, or comprehensive examination) to complete the degree.

Core Courses

SOC 510 Computer Data Analysis .....3 hours
SOC 604 Proseminar in Sociology .....1 hour
SOC 610 Statistics .....3 hours
SOC 615 Research Methodology .....3 hours
SOC 620 Sociological Theory .....3 hours

Minimum Total .....13 Hours

Breakdown of hours for Thesis, Internship, or Comprehensive Examination

	Thesis	Internship	Comp Exam
Urban Geography Electives	12 hours	12 hours	15 hours
Sociology Electives*	0 hours	6 hours	9 hours**
SOC 600 (Thesis/Internship)	6 hours	6 hours	0 hours
Core Courses	13 hours	13 hours	13 hours
TOTAL	31 hours	37 hours	37 hours

* At least 3 of the nine hours of the Sociology electives must be 600-level.

** Six hours of courses outside Geography and Sociology may be selected with the permission of the graduate program coordinator.

Teaching and Learning (EDTL)

www.louisville.edu/edu

Graduate Program Faculty

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Denzil Edge
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William L. Husk
Anne O. Netick
V. Daniel Ochs
Samuel E. Peavey
John H. Pollock
F. Randall Powers
Patricia A. Walker

Programs

The Department of Teaching and Learning offers the Master of Arts in Teaching (MAT) Degree leading to certification in Early Elementary Education, Middle School Education, Secondary Education 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, Middle School and Secondary 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 Doctor of Education Degree (EdD).

The Master of Arts in Teaching (MAT) degree in Secondary Education leads to certification in grades 8-12 for English, Biology, Mathematics, Social Studies, or Physical Science (business and marketing education is 5-12, P-12 Certification in French, German and Spanish is also available through MAT in Secondary Education. Refer to the Fine Arts Department listing for information about the MAT in Art Education Grades P-12. Refer to the Music Department listing for information about the MAT in Music Education Grades P-12.). The Master of Education degree is designed for certified teachers to pursue advanced studies in secondary education.

Non-degree Rank II and Rank I programs provide considerable flexibility for students to pursue expanded professional careers in teaching and related areas.

A variety of graduate degree programs are offered in Special Education at the master's and doctoral degree. 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.

Master of Education in Early Childhood Education (Birth to Primary Teacher Certification Program)

Major:
Degree: MED
Unit: GE

Program Intent

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 36 hours of course work. However, some students admitted to the program may not have general teacher competencies and will need to take pre-requisite courses as identified by their advisor. Due to the differing backgrounds of students who enter the program completion of the Self Assessment to determine areas of strength and need will be required upon admission.

Prerequisites

1. Baccalaureate degree from an accredited college in Child Development; Early Childhood Education; Early Childhood Special Education; or related field BA/BS degree in an unrelated field is based on completion of the Self Assessment.
2. Admission to Teacher Education
3. Admission to Graduate School
4. Completion of Self Assessment

Required Core Courses	Semester Hours	Total
EDFD 600, Introduction to Research Methods and Statistics	3	
EDEM 627, Applied Child Development	3	
EDEM 632, Curriculum Approaches of Early Childhood Education	3	
EDEM 633, Curriculum and Methods in Early Childhood Special Education	3	
EDEM 637, Infant/Toddler Development and Care	3	
EDSP 684, Early Family Intervention for Pre-School Children With Disabilities	3	
EDSP 686, Programs and Services for Pre-School Children With Disabilities	3	
EDEM 604, Special Problems or Field Experience in Curriculum Development/EDSP 697 Topical Seminar	3	
EDSP 687, Practicum/Action Research (field based)*	6	30

Elective Courses

(select one course in two of the three strands listed below)

Strand I (Major focus: Typical Development)

ART 507, Art Education for Early Primary	3	
EDEM 636, Theories of Play	3	
PSYC 661, Advanced Developmental Psychology	3	

Stand 2 (Major focus: Atypical Development)

CMDS 564, Pre-School Language Development	3	
EDSP 683, Early Childhood/Special Education Screening	3	
HPES 618, Diverse Populations and Physical Activity	3	

Strand 3 (Major focus: Families and Programs)

EDEM 635, Administration and Consultation: Day Care and Early Childhood Education	3	
SW 625, Children and Families	3	6

* Successful completion of both EDSP 687, Practicum/Action Research and a professional portfolio, are required at the end of the program and serve as the exit requirements.

Minimum Total **36**

Master of Education in Early Childhood Education (without teacher certification)

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 the master's degree in Interdisciplinary Early Childhood Education.

Prerequisites:
1. Baccalaureate degree from an accredited college
2. Admission to Graduate School
3. Completion of IECE Self Assessment

Required Courses	Semester Hours	Total
Curriculum: (select 18 hours)		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDEM 632, Curriculum Approaches of Early Childhood Education	3	
EDEM 633, Curriculum and Methods in Early Childhood Special Education	3	
EDEM 637, Infant/Toddler Development and Care	3	
EDSP 537, Language Learning for Exceptional Children	3	
CMDS 564, Preschool Language Intervention	3	
HPES 618 Diverse Populations in Physical Activity	3	
ART 507, Art Education for Early Primary	3	18
Development: (select 12 hours)		
EDEM 627, Applied Child Development	3	
EDEM 630, Theories of Child Development	3	
EDEM 636, Theories of Play	3	
EDSP 683, Programs and Services for Preschool Children with Disabilities	3	
EDSP 687, Practicum/Action Research (Exit Requirement)	3	
PSYC 661, Advanced Developmental Psychology	3	12
Families and Programs: (select 6 hours)		
EDEM 635, Administration and Consultation: Daycare and Early Childhood Education	3	
EDSP 684, Early Family Intervention for Preschool Children with Disabilities	3	
EDSP 686, Program and Services for Preschool Children with Disabilities	3	
SW 625, Children and Families	3	6
Minimum Total		**36**

Exit requirement: Successful completion of an IECE portfolio and EDSP 687 Practicum/Action Research.

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

Major: ERED
Degree: MAT
Unit: GE

Admission Requirements

Bachelor's degree with 2.75 grade point average, "C" or better in writing course, Speech, ART 307, MUS 525, HPES 274, MATH 151 and 152, one physical and one biological science course, one with a lab, additional Teacher Education requirements, GRE score of at least 800 (combined verbal and quantitative) and admitted to the Graduate School.

Core Courses	Semester Hours	Total
EDTL 602, Exploring Teaching within the Socio-Political Context of P-12 Schools	3	
EDTL 501, P-5 General Methods	3	
ECPY 607, Learning Theory and Human Growth and Development	3	
Note: *The above three (3) courses must be taken prior to any of the next four (4) courses*		
EDTL 603, P-5 Language Arts Methods	3	
EDTL 604, P-5 Mathematics Methods	3	
EDTL 605, P-5 Science Methods	3	
EDTL 606, Social Studies Methods	3	

Mid-Point Assessment
Completion of all education courses listed above with a minimum of 3.0 in each; PRAXIS exam has been taken; recommendation of advisor.
EDTL 615, Student Teaching (Primary) 3
EDTL 616, Student Teaching (Intermediate) 3
EDSP 545, Exceptional Child in a Regular Classroom 3

Certification Exit Assessment
"B-" or better in each student teaching placement, satisfactory certification portfolio, passing scores on PRAXIS test, 2.5 GPA.
EDTL 503, Developing Cross-Cultural Competence* 3
EDTL 504, Teaching with Technology** 2
EDTL 505, Challenging Advanced Learners** 1

Note:
* Can be taken at any point in program.
** Must be taken concurrently and during/or after first content methods course.

MAT Degree Exit Assessment: "B-" or better in each student teaching placement, certification exit requirements plus a satisfactorily updated portfolio, and an overall 3.0 GPA

Minimum Total 36

Masters of Arts in Teaching Middle School Education (5-9)

Major: MSED
Degree: MAT
Unit: GE

Admission Requirements

Admission to the 5-9 MAT program: Bachelors degree with 2.75 GPA, "C" or better in writing course, Speech, within 9 credits of content areas with a minimum GPA of 2.5 in each, additional Teacher Education requirements, GRE score of at least 800 (combined verbal and quantitative), admitted to the Graduate School.

Core Courses	Semester Hours	Total
EDTL 602, Exploring Teaching within the Socio-Political Context of P-12 Schools	3	
EDTL 501, General Methods	3	
ECPY 607, Learning Theory and Human Growth and Development	3	
Note: *The above three courses must be taken prior to any of the next two courses.*		
EDTL 607, Middle School Methods I	3	
EDTL 608, Middle School Methods II	3	

Mid-Point Assessment
Completion of all education courses listed above with a minimum of 3.0 in each, PRAXIS exam has been taken, recommendation of advisor.
EDTL 617, Middle Grades Student Teaching I 3
EDTL 618, Middle Grades Student Teaching II 3
EDSP 545, Exceptional Child in a Regular Classroom 3

Certification Assessment
"B-" or better in each student placement; satisfactory certification portfolio; passing scores on PRAXIS exam; on PRAXIS test, 2.5 GPA.
EDTL 503, Developing Cross-Cultural Competence* 3
EDTL 504, Teaching with Technology ** 2
EDTL 505, Challenging Advanced Learners** 1
EDTL 620, Reading and Writing Across the Curriculum/Adolescent Literature* 3

Elective (3) chosen from:
EDTL 621, Intensive Field Experience (methods semester only), academic support course*, or advanced education course* 3

* Can be taken at any point in the program
** Can be taken concurrently with or after either content area methods course

MAT Degree Exit Assessment: "B-" or better in each student teaching placement, certification exit requirements plus a satisfactory updated portfolio, and an overall 3.0 GPA.

Minimum Total 36

Master of Arts in Teaching in Secondary School (8-12)

Major: SE
Degree: MAT
Unit: GE

Admission requirements
Bachelor's degree with 2.75 GPA; "C" or better in a writing course; Speech; within 9 credits of completing content area, with a minimum GPA of 2.5, additional Teacher Education requirements, GRE score of at least 800 (combined verbal and quantitative), admission to the Graduate School.

Core Courses	Semester Hours	Total
EDTL 602, Exploring Teaching within the Socio-Political Context of P-12 Schools	3	
EDTL 501, General Methods	3	
ECPY 607, Learning Theory and Human Growth and Development	3	

Note: *The above three courses must be taken prior to the next course listed below.*

EDSD 606, Special Methods in Secondary Education (in teaching field)	3	

Mid-Point Assessment:
Completion of all education courses listed above with a minimum of 3.0 in each, within 9 credits of completing the content major with a minimum 2.5 GPA, PRAXIS exam has been taken, recommendation of advisor.

EDTL 619, Student Teaching in the High School	6	
EDSP 545, Exceptional Child in the Regular Classroom	3	

Certification Exit Assessment:
"B-" or better in student teaching, satisfactory portfolio, passing score on PRAXIS, 2.5 GPA overall and 2.5 GPA in content area.

EDTL 503, Developing Cross-Cultural Competence*	3	
EDTL 504, Teaching with Technology**	2	
EDTL 505, Challenging Advanced Learners**	1	
EDTL 620, Reading and Writing Across the Curriculum/Adolescent Literature*	3	

Electives chosen from:

Academic support courses*	6	

* Can be taken at any point in the program
** Can be taken concurrent with or after content methods course

MAT Degree Exit Assessment: Certification Exit Requirements, satisfactory updated portfolio, and 3.0 GPA overall.

Minimum Total.....36

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

Major: ERED
Degree: MED
Unit: GE

Required Professional Courses	Semester Hours	Total
EDFD 600, Introduction to Research Methods and Statistics [must be taken within the first nine (9) hours]	3	
EDTL 622, Orientation and Readings (taken in the first semester)	3	6

Leadership and Change (select one of the following)

EDTL 623, Leadership and Change	3	
EDTL 624, Curriculum Theory	3	
EDTL 625, Social and Ethical Development of Teaching	3	
EDAD 603, Administrative Leadership in a Reform Environment	3	3

Success for All Learners (select one of the following)

EDEM 642, Literacy Learning and Cultural Differences	3	
EDTL 626, Affirming Diversity	3	
EDTL 503, Developing Cross-Cultural Competence	3	
EDSP 697, Topical Seminar	3	3

Area of Emphasis

In consultation with the Graduate Advisor, twelve (12) hours of Graduate courses must be selected	12	
EDTL 627, Capstone Course	3	
Elective	3	6

Exit Requirement
Successful completion of a portfolio based on the Kentucky Teacher Standards or a Masters Thesis (EDEM/EDSD 699) 2-5

Minimum Total.....30

Notes:
1. Minimum of 18 hours in 600-level courses is required.
2. Program completion requires a 3.0 GPA. No credit is awarded for grades lower than "C".
3. Final acceptance of transfer credit (a maximum of 6 hours) is dependent upon receipt of transcript.
4. Official program must be completed by advisor and filed with the College of Education and Human Resource Development Advising Center at the beginning of the program.
5. A maximum of 6 hours taken in non-degree status can be applied toward a master's degree, upon approval of advisor.
6. All courses must be completed within 6 years of admission to the program.

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

Major: MSED
Degree: MED
Unit: GE

Core Courses	Semester Hours	Total
EDTL 622, Orientation and Readings (take in first semester of enrollment)	3	
EDFD 600, Introduction to Research Methods and Statistics	3	6

Leadership and Change: Select one of the following courses

EDTL 623, Leadership and Change	3	
EDTL 624, Curriculum Theory	3	
EDTL 625, Social and Ethical Development of Teaching	3	
EDAD 603, Administrative Leadership in a Reform Environment	3	3

Success for all learners: Select one of the following courses

EDTL 503, Developing Cross-Cultural Competence	3	
EDTL 626, Affirming Diversity	3	
EDEM 642, Literacy Learning and Cultural Differences	3	3

Area of Emphasis

In consultation with a Graduate Advisor, the student must select a minimum of 12 semester hours of graduate courses.	12	
EDTL 627, Capstone Course	3	
Elective	3	6

Exit Requirements
Successful completion of a portfolio based on the Kentucky Teacher Standards or a Masters Thesis (EDEM/EDSD 699) 2-5

Minimum Total.....30

Notes:
1. Minimum of 18 hours in 600-level courses is required.
2. Program completion requires a 3.0 GPA. No credit is awarded for grades lower than "C".
3. Transfer credit must be officially accepted by the advisor (maximum of 6 hours) - final acceptance is dependent upon receipt of official transcripts.
4. Official program must be approved by advisor and filed with the College of Education and Human Development Advising Center at the beginning of the program.
5. A maximum of 6 hours taken in non-degree status can be applied toward a master's degree, upon approval of advisor.
6. All courses must be completed within 6 years of admission to the program.

Master of Education in Secondary School Education (8-12)

Major: SE
Degree: MED
Unit: GE

Core Courses	Semester Hours	Total
EDTL 622, Orientation and Readings (taken first semester of enrollment)	3	
EDFD 600, Introduction to Research Methods and Statistics	3	6
Leadership and Change: Select one of the following courses		
EDTL 623, Leadership and Change	3	
EDTL 624, Curriculum Theory	3	
EDTL 625, Social and Ethical Development of Teaching	3	
EDAD 603, Administrative Leadership in a Reform Environment	3	3
Success for All Learners: (select one of the following courses)		
EDEM 642, Literacy, Learning and Cultural Differences	3	
EDTL 626, Affirming Diversity	3	
EDTL 503, Developing Cross-Cultural Competence	3	
EDSP 697, Topical Seminar	3	
Area of Emphasis		
In consultation with the graduate advisor, students must select twelve hours (12) of graduate course work.	12	
EDTL 627, Capstone Course	3	
Elective	3	3
Exit Requirements		
Successful completion of a professional portfolio based on the Kentucky Teacher Standards or a Master's Thesis (EDEM/EDSD 699).	2-5	
Minimum Total		**30**

Note:
1. A minimum of 18 hours in 600-level courses is required
2. Program completion requires a 3.0 GPA. No credit is awarded for grades lower than "C".
3. Final acceptance of transfer credit (maximum of 6 hours) is dependent upon receipt of official transcript.
4. Official program must be completed by advisor and filed with the Education Advising Center at the beginning of the program.
5. A maximum of 6 hours taken in non-degree status can be applied toward a Masters degree.
6. All courses must be completed within 6 years of admission to the program.

Rank I Program in Elementary Education (Advanced Practitioner)

Major: ERED
Unit: GE

Prerequisite for Admission:
1. Baccalaureate degree from an accredited college.
2. Certification in a K-12 area and M.Ed. or Rank II equivalency.

Requirements	Semester Hours	Total
Leading Change:		
Select one of the following:		
EDTL 622, Orientation and Readings (taken in the first semester of enrollment)	3	
EDFD 600, Introduction to Research Methods and Statistics	3	
Leadership and Change:		
Select one one of the following courses:		
EDTL 623, Leadership and Change	3	
EDTL 624, Curriculum Theory	3	
EDTL 625, Social and Ethical Development of Teaching	3	
EDAD 603, Administrative leadership in a Reform Environment		
The Multicultural Learner:		
Select one of the following courses:		
EDEM 642, Literacy learning and Cultural Differences	3	
EDTL 403/503, Developing Cross-Cultural Competence	3	
EDTL 626, Affirming Diversity	3	
PAS 529, Teacher Institute on African-American Issues	3	
SOC 630, Sociology of Education	3	
WMST 532, History of American Sexualities	3	
WMST 556, Feminist Theory	3	
Area of Emphasis (courses selected with advisor approval)	12	
EDTL 627 Capstone Course	3	
Electives	9	
Exit Requirements		
Portfolio ***or*** National Board Certification		
Minimum Total		**30**

Note:
1. Minimum of fifteen (15) hours must be completed at the University of Louisville.
2. Transfer credit must be officially accepted by the advisor. Final acceptance is dependent upon receipt of official transcripts.
3. To complete the program, students must have minimum of a 3.0 cumulative grade point average. No credit shall be accepted for carrying a grade lower than "C".

Rank I Program in Middle School Education (Advanced Practitioner)

Major: MSED
Unit: GE

Prerequisite for Admission:
1. Baccalaureate degree from an accredited college.
2. Certification in a K-12 area and M.Ed. or Rank II equivalency.

Requirements	Semester Hours	Total
Leading Change:		
Select one of the following:		
EDTL 622, Orientation and Readings (taken in the first semester of enrollment)	3	
EDFD 600, Introduction to Research Methods and Statistics	3	
Leadership and Change:		
Select one one of the following courses:		
EDTL 623, Leadership and Change	3	
EDTL 624, Curriculum Theory	3	
EDTL 625, Social and Ethical Development of Teaching	3	
EDAD 603, Administrative leadership in a Reform Environment		
The Multicultural Learner:		
Select one of the following courses:		
EDEM 642, Literacy learning and Cultural Differences	3	
EDTL 403/503, Developing Cross-Cultural Competence	3	
EDTL 626, Affirming Diversity	3	
PAS 529, Teacher Institute on African-American Issues	3	
SOC 630, Sociology of Education	3	
WMST 532, History of American Sexualities	3	
WMST 556, Feminist Theory	3	
Area of Emphasis (courses selected with advisor approval)	12	
EDTL 627 Capstone Course	3	
Electives	9	
Exit Requirements		
Portfolio or National Board Certification		
Minimum Total		**30**

Note:
1. Minimum of fifteen (15) hours must be completed at the University of Louisville.
2. Transfer credit must be officially accepted by the advisor. Final acceptance is dependent upon receipt of official transcripts.
3. To complete the program, students must have minimum of a 3.0 cumulative grade point average. No credit shall be accepted for carrying a grade lower than "C".

Rank I Program in Secondary Education (Advanced Practitioner)

Major: SE
Unit: GE

Prerequisite for Admission:
1. Baccalaureate degree from an accredited college.
2. Certification in a K-12 area and M.Ed. or Rank II equivalency.

Requirements	Semester Hours	Total
Leading Change:		
Select one of the following:		
EDTL 622, Orientation and Readings (taken in the first semester of enrollment)	3	
EDFD 600, Introduction to Research Methods and Statistics	3	
Leadership and Change:		
Select one one of the following courses:		
EDTL 623, Leadership and Change	3	
EDTL 624, Curriculum Theory	3	
EDTL 625, Social and Ethical Development of Teaching	3	
EDAD 603, Administrative leadership in a Reform Environment		
The Multicultural Learner:		
Select one of the following courses:		
EDEM 642, Literacy learning and Cultural Differences	3	
EDTL 403/503, Developing Cross-Cultural Competence	3	
EDTL 626, Affirming Diversity	3	
PAS 529, Teacher Institute on African-American Issues	3	
SOC 630, Sociology of Education	3	
WMST 532, History of American Sexualities	3	
WMST 556, Feminist Theory	3	
Area of Emphasis (courses selected with advisor approval)	12	
EDTL 627 Capstone Course	3	
Electives	9	
Exit Requirements		
Portfolio or National Board Certification		
Minimum Total		**30**

Note:
1. Minimum of fifteen (15) hours must be completed at the University of Louisville.
2. Transfer credit must be officially accepted by the advisor. Final acceptance is dependent upon receipt of official transcripts.
3. To complete the program, students must have minimum of a 3.0 cumulative grade point average. No credit shall be accepted for carrying a grade lower than "C".

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

Major: RE
Degree: MED
Unit: GE

Required Core	Semester Hours	Total
EDFD 600, Introduction to Research Methods and Statistics (must be taken within the first 9 hours)	3	
EDTL 624, Curriculum Theory	3	6
Required Literacy		
EDEM 610, Foundations of Literacy (must be taken in first nine hours)	3	
EDEM 614, Helping Struggling Readers and Writers K-12	3	
EDEM 615, Measurement and Evaluation in Literacy	3	
EDEM 642, Literacy, Learning, and Cultural Differences	3	
EDSD 617, Louisville Writing Project (must apply)		
OR		
EDEM 644, The Authoring Cycle (3),		
OR		
EDSD 647, Teaching Writing and Language in Secondary School (3)	3	15-18
Literacy Electives These courses will be selected from courses according to Kentucky Department of Education State Guideline (IIIB) for preparation of reading specialist.	3-6	
Capstone Experience		
EDEM 618, Practicum in Literacy (exit requirement)	3	
Minimum Total		**30**

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.

Core Requirements	Semester Hours	Total
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 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:

Required Courses	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		
Successful completion of a portfolio based on the Kentucky Teachers Standards	3	3
Minimum Total		**46**

Master of Education in Special Education with concentration in Learning and Behavior Disorders

(Stand-alone certification program in Learning and Behavior Disorders for persons with no teacher certification)

Major: SPE
Degree: MED
Concentration: SLBD
Unit: GE

Program Prerequisites

1. Baccalaureate degree from an accredited college or university.
2. Admission to Graduate School.
3. Admission to Teacher Education.
4 Employed as teacher in a Learning and Behavior Disorder classroom.

Three Options:

Option A: Jefferson County Public Schools Charter College Program.
This option leads to a Master of Education degree and teacher certification in Learning and Behavior Disorders. The program begins in the summer and is completed in five semesters. While in the program you teach (with an emergency certificate) in a LBD classroom for JCPS in most cases for each "B" or higher you earn in the program, JCPS will reimburse you for a part of your tuition.

Option B: Master of Education degree or Certification only in LBD
This option can lead to a Master of Education degree with certification in LBD or certification only in LBD. This program begins in the summer and can be completed in five semesters or up to six years. While in the program you teach (with an emergency certificate) in a LBD classroom in one of your local school districts. The Teaching and Learning Department's Admissions committee must approve your school location. Remember, should you decide to start out in the certification only program and later change to the Master of Education program, you can only transfer six hours to the MED program.

Option C: Alternative Certification with a Master of Education Degree or certification only

This option can lead to a Master of Education degree with certification in LBD or certification only in LBD. The program begins in the summer, takes two years to complete. As part of this program you will receive a temporary provisional teaching certification. You must be employed an an LBD teacher. The Teaching and Learning Department's Admissions Committee must approve your school location. In the second year of this program, you will participate in the Kentucky Teacher Internship Program (KTIP). Remember, should you decide to start out in the certification only program and later change to the MED program, you can only transfer six hours to the MED program.

Required Courses for certification	Semester Hours	Total
EDSP 541, Introduction to Learning and Behavior Disorders	3	
EDSP 675, Management of the Behavior Problem Child in the Classroom	3	
EDSP 537, Language Learning for Exceptional Children	3	
EDSP 612, Curriculum Methods and Assessment I	3	
EDSP 613, Curriculum Methods and Assessment: Field Component I	3	
EDSP 618, Instructional Technology for Students With Special Needs	3	
EDSP 693, Consulting with Parents and Teachers of Exceptional Children	3	
EDSP 616, Curriculum Methods and Assessment II	3	
EDSP 617, Curriculum Methods and Assessment: Field Component II	3	
EDSP 614, Transition Programs Services for Children and Youth with Disabilities	3	
EDSP 681, Early Childhood Education of Exceptional Children	3	
EDSP 594, Problems and Methods of Teaching the Physically Handicapped and Sensory Impaired	3	
EDEM 610, Literacy Research and Theory	3	
EDEM 620, Introduction to Teaching Elementary Mathematics Education	3	42
Additional courses for Masters degree:		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDFD xxx, Elective (approved by advisor)	3	

Exit Requirements:

- Develop successful professional portfolio
- Successfully complete all coursework with grade of "B" or better
- Successful completion of the following PRAXIS Exams is required:
  - The Application of Core Principles Across Categories of Disability and Teaching
  - Students with Emotional/Behavioral Disorders.

Minimum Total 48

Successful completion of the appropriate PRAXIS specialty exams is required for teacher certification.

Rank II Certification in Special Education with a Concentration in 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. Successful completion of EDSP 540- Introduction to Exception Children

Basic Professional Courses	Semester Hours	Total
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 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

Graduate Cor	Semester Hours	Total
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 College of Education and Human Development; subject to approval of advisor)	9	9
Exit Requirement		
EDSP 639, Research Analysis in Special Education	3	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

Graduate Core	Semester Hours	Total
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 College of Education and Human Development; 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 a concentration in Moderate and Severe Disabilities

Major: EDSP
Degree: MED
Concentration: MSVD
Unit: GE

The first twenty-two (22) hours lead to certification in Moderate and Severe Disabilities, 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

Certification Requirements	Semester Hours	Total
EDSP 615, The Normalization Principle in Human Service Systems	3	
EDSP 627, 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, Transdisciplinary Collaboration for Inclusion	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.

Master of Education in Special Education with concentration in Moderate and Severe Disabilities

(Stand-alone Certification Program in Moderate and Severe Disabilities for persons with no teacher certification)

Major: SPE
Degree: MED
Concentration: MSDD
Unit: GE

Admission Requirements

1. Baccalaureate degree from an accredited college or university
2. Admission to Graduate School
3. Admission to Teacher Education
4. Employed as a teacher in a moderate and severe disabilities classroom

Two Options

Option A: Master of Education Degree or Certification Only
This option can lead to a Master of Education degree with certification in MSD OR certification only in MSD. You may begin the program in any semester and complete it in two years or you may take as long as six years. While in the program you teach (with an emergency certificate in a MSD classroom in one of our local school districts. The Teaching and Learning Department's Admissions Committee must approve your school location. Remember, should you decide to start out in the certification only program and late change to the Master of Education program, *you can only transfer six hours to the MED program.*

Option B: Alternative Certification with a Master of Education Degree or Certification Only
This option can lead to a Master of Education degree with certification in MDS OR certification only in MSD. As part of this program you will receive a temporary provisional teaching certificate. You must be employed as an MSD teacher. The Teaching and Learning Department's Admissions Committee must approve your location. The second year of this program you will participate in the Kentucky Teacher Internship Program (KTIP). Remember, should you decide to start out in the certification program and later change to the MED program, *you can only transfer six hours to the MED program.*

Required Courses	Semester Hours	Total
EDSP 614, Transition Program Services for Children and Youth With Disabilities	3	
EDSP 627, Applications of Assistive Technology	3	
EDSP 634, Characteristics and Needs of Students With Severe and Moderate Disabilities	3	
EDSP 636, Diagnostic/Prescriptive Teaching of Individuals With Moderate Mental Retardation	3	
EDSP 637, Transdisciplinary Collaboration for Inclusion	3	
EDSP 638, Educational Management of Physical and Multiple Disabilities	3	
EDSP 537, Language Learning for Exceptional Children	3	
EDEM 610, Literacy Research and Theory	3	
EDSP 613, Curriculum Methods and Assessment: Field Component I (MSD)	3	
EDSP 617, Curriculum Methods and Assessment Field:Component II (MSD)	3	
EDSP 675, Management of the Behavior Problem Child in the Classroom	3	33
For Rank or Masters Program		
EDFD 600, Introduction to Research Methods and Statistics	3	
EDFD 6XX, Elective	3	6
Minimum Total		**39**

NOTE:
Successful completion of the appropriate PRAXIS specialty exams is required for teacher certification.

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

Graduate Core	Semester Hours	Total
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 College of Education and Human Development; 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 a concentration in Visual Impairment and Blindness

Major: EDSP
Degree: MED
Concentration: SVI
Unit: GE

The first twenty-seven (27) hours lead to teacher certification only in VI, 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

Certification Requirements (27 hours)	Semester Hours	Total
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, 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, Transdisciplinary Collaboration for Inclusion	3	
EDSP 638, Educational Management of Health, 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.

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.

Certification Requirements	Semester Hours	Total
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 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.

Theatre Arts (TA)

www.louisville.edu/a-s/tas/

Graduate Program Faculty

Chair
Michael F. Hottois, Professor

Professors
Albert J. Harris

Associate Professors
Rinda Frye
Lundeanna M. Thomas
James Tompkins

Assistant Professor
Nefertiti Burton

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
Minimum 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**

Uuban and Public Affairs (UPA)

http://cbpa.lousivlle.edu/academicprograms/upa.htm

Graduate Program Faculty

Program Director
Steven C. Bourassa, Professor

Professors
John I. Gilderbloom
Steven G. Koven
Peter Meyer
H.V. Savitch
Wayne M. Usui
Gennaro Vito
Ronald K. Vogel
J. Allen Whitt

Associate Professors
Carrie G. Donald
Thomas S. Lyons
Assistant Professors
Christopher Mausolff
David M. Simpson

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 in the fields of environmental policy and planning, urban planning and development, and urban policy and administration including criminal justice administration.

Students are required to complete 48 credit hours of study. This requires a sequence of core courses consisting of 18 credit hours. Students must complete 18 credit hours in one specialty area, including 3 required courses. Three specialty areas are offered: Environment Policy and Planning, Urban Planning and Development, and Urban Policy and Administration. Twelve credit hours of dissertation research are also required. Students must pass qualifying examinations on the core and specialty area before commencing formal dissertation work. Students should consult the Program Guidelines for details.

Admission Requirements

Admission is competitive. Successful applicants should, at minimum:

- hold a master's degree or equivalent professional degree in an appropriate field with a grade point average (GPA) of at least 3.0 (on a 4.0 scale); preference is given to applicants with GPAs of 3.5 or better.
- achieve a score of at least 1500 (verbal, quantitative, and analytical) on the Graduate Record Examination.

Exceptions may be made to these criteria for applicants who otherwise have strong applications. Program gives preference to applicants who intend to study full-time and who can be supported with financial aid (a Graduate Research Assistantship or a Fellowship). However, a small number of places are reserved each year for highly capable students who intend to study part-time. Such students should note that the Graduate School requires every PhD student to complete at least one year of full-time study.

Doctorate in Urban and Public Affairs

Major: UPA
Degree: PhD
Unit: GB

	Semester Hours	Total
Core Courses		
UPA 602 Urban Policy and Governance	3	
UPA 603 Urban Economics	3	
UPA 606 Research Methods	3	
UPA 610 Urban Theory & Public Affairs	3	
UPA 621 Program Analysis and Program Evaluations	3	
UPA 621 Program Analysis and Program Evaluations	3	
SOC 610 Seminar in Statistics	3	18
One Specialty Area (listed below)	18	18
UPA 700 Dissertation Research	12	12
Minimum Total Hours		**48**

Students with no prior study of statistics are required to take PADM 601/PLAN 602 Statistics for Public Affairs and SOC 510 Computerized Data Analysis prior to enrolling in SOC 610. Students with previous study of basic statistics, but no experience with statistical software, are required to take SOC 510 prior to enrolling in SOC 610. Students with no prior study in economics are recommended to take an introductory course in that subject, such as PLAN 500 Foundations of Economics. These courses do not count toward the 48-semester-hour-requirement.

Specialty Areas:
Students must pursue one of the three specialty areas, including 9 hours of required courses and 9 hours of elective courses. Elective courses from other specialty areas, programs, or departments may be taken with the approval of the Program Director.

Environmental Policy and Planning Specialization

Required Courses

UPA 678 Land Use and Planning Law	3
UPA 679 Environmental Policy	3
UPA 683 Land Use Planning	3

Elective Courses

PLAN 612 Mediation and Dispute Resolution	3
PLAN 615 Special Statistics	3
PLAN 619 Urban Geographic Information Systems Applications	3
SOC 616 Advanced Multivariate Modeling	3
SOC 618 Qualitative Field Research Methods	3
UPA 627 Decision Models	3
UPA 629 Geographic Information Systems	3
UPA 632 Independent Study	1-6
UPA 672 Strategic Planning and Management	3
UPA 680 Special Topics in Urban and Public Affairs	3
UPA 684 Planning Theory	3
UPA 687 Environmental Policy and Natural Hazards	3
UPA 696 Urban Infrastructure	3

Urban Planning and Development Specialization

Required Courses

UPA 623 Comparative Urban Development	3
UPA 683 Land Use Planning	3
UPA 684 Planning Theory	3

Elective Courses

PLAN 612 Mediation and Dispute Resolution	3
PLAN 616 Analytical Urban Geography	3
PLAN 618 Urban Demography	3
PLAN 619 Urban Geographic Information Systems Applications	3
SOC 616 Advanced Multivariate Modeling	3
SOC 618 Qualitative Field Research Methods	3
UPA 624 Economic Conditions and Forecasting	3
UPA 627 Decision Models	3
UPA 629 Urban Geography and Information Systems	3
UPA 632 Independent Study	1-6
UPA 640 Economic Development	3
UPA 648 Housing	3
UPA 651 The Politics of Urban Development	3
UPA 672 Strategic Planning and Management	3
UPA 678 Land Use and Planning Law	3
UPA 679 Environmental Policy	3
UPA 680 Special Topics in Urban and Public Affairs	1-6
UPA 682 Principles of Urban Design	3
UPA 686 History of Urban Architecture and Design	3
UPA 687 Environmental Policy and Natural Hazards	3
UPA 690 Urban Transportation Planning	3
UPA 696 Urban Infrastructure	3

Urban Policy and Administration Specialization

Required Courses

UPA 630 Politics of Urban Policy	3
UPA 660 Advanced Organizational Behavior	3
UPA 661 Public Administration and Organizational Theory	3

Elective Courses

JA 603 Criminal Justice System Planning	3
JA 605 Police in our Political and Social Systems	3
JA 606 Personal Management in the Criminal Justice System	3
JA 610 Theoretical Foundations of Corrections	3
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 651 Computer Applications in Criminal Justice	3
PADM 648 Mediation and Dispute Resolution	3
SOC 616 Advanced Multivariate Modeling	3
SOC 618 Qualitative Field Research Methods	3
SOC 634 Social Network Analysis	3
SOC 640 Seminar in Urban Sociology	3
UPA 623 Comparative Urban Development	3
UPA 624 Economic Conditions and Forecasting	3
UPA 625 Macroeconomic Theory	3
UPA 627 Decision Models	3
UPA 628 Microeconomic Theory	3
UPA 632 Independent Study	1-6
UPA 640 Economic Development	3
UPA 643 Inequality in Public Policy	3
UPA 646 Urban and Public Finance	3
UPA 647 Public Budgeting and Finance	3
UPA 648 Housing	3
UPA 651 Politics of Urban Development	3
UPA 662 Administrative Law and Processes	3
UPA 667 Human Resource Management	3
UPA 672 Strategic Planning and Management	3
UPA 679 Environmental Policy	3
UPA 680 Special Topics in Urban and Public Affairs	3

Urban Planning (PLAN)

www.cbpa.louisville.edu/academicprograms/mastersplanning.htm

Graduate Program Faculty

Program Director
Steven C. Bourassa, Professor

Professors
Arthur W. Dakan
John I. Gilderbloom
Steven G. Koven
Peter B. Meyer
H.V. Savitch

Associate Professors
Carrie G. Donald
Clara A. Leuthart
Thomas S. Lyons

Assistant Professors
Christopher Mausolff
Darren M. Scott
David M. Simpson

Program

The Department of Urban and Public Affairs offers a Master of Urban Planning (MUP) degree in cooperation with the Department of Geography and Geosciences. The MUP Program prepares students to work in a wide variety of fields, including land use and environmental planning, parks and recreation planning, urban design, historic preservation, transportation planning, open space planning, regional planning, and in the development of geographic information systems. With the continuing expansion of Louisville and the nation's other metropolitan areas, urban planning is one of the leading professional fields in terms of demand and job satisfaction, according to surveys by Jobs Rated Almanac and Encyclopedia of Careers and Vocational Guidance.

Students can specialize in one or two of three areas: land use and environmental planning; administration of planning organizations; and spatial analysis for planning. Students have the opportunity to benefit from working on real planning problems through the required internship and studio courses. Studio courses are taught at the Urban Design Studio, located in downtown Louisville and operated by the MUP Program in cooperation with the City of Louisville and College of Architecture of the University of Kentucky.

The degree requires 48 hours (two years of full-time study or the equivalent in part-time study), although up to 12 hours of relevant graduate course work may be transferred into the program. Students may enroll on a part-time or full-time basis.

Admission Requirements

Applicants must have a bachelor's degree (any major is acceptable), must have taken the Graduate Record Examination, and must submit two letters of reference. Admission is competitive and generally requires a minimum combined quantitative and verbal GRE score of 1000 and minimum undergraduate GPA of 3.0 (B).

Financial Aid

The Department of Urban and Public Affairs administers a number of Graduate Research Assistantships (GRAs) that are awarded competitively and are intended to support full-time study. Students in the MUP Program may receive a maximum of two years of support as a GRA. The GRAs provided a stipend of at least $10,000 for 20 hours of work per week over a ten-month period. They also provide for remission of tuition and health insurance. Early application is encouraged.

Master of Urban Planning

Major: PLAN
Degree: MUP
Unit: GB

	Semester Hours	Total
Core Courses		
PLAN 500 Foundations of Economics	3	
PLAN 600 Planning History and Issues	3	
PLAN 601 Planning Theory	3	
PLAN 602 Statistics for Public Affairs	3	
PLAN 603 Urban Economics	3	
PLAN 604 Applied Research Methods	3	
PLAN 605 Land Use and Planning Law	3	
PLAN 606 Professional Practice	3	
One Specialty Area (listed below)	9	
Other Electives	9	
PLAN 649 Planning Internship	3	
PLAN 650 Capstone Studio	3	
Minimum Total Hours		**48**

Specializations

The courses available for each specialization are as follows. Other courses not listed below may be substituted with the permission of the Program Director.

Specialization in Land Use and Environmental Planning

PLAN 501 Urban Environmental Quality	3
PLAN 607 Land Use and Environmental Planning	3
PLAN 608 Geographic Information Systems	3
PLAN 612 Mediation and Dispute Resolution	3
PLAN 620 Environmental Policy	3
PLAN 622 Urban Design	3
PLAN 623 Environmental Policy and Natural Hazards	3

Specialization in Administration of Planning Organization

PLAN 609 Public Budgeting and Finance	3
PLAN 610 Strategic Management and Planning	3
PLAN 611 Human Resources Management	3
PLAN 612 Mediation and Dispute Resolution	3
PLAN 613 Public Administration and Organizational Behavior	3

Specialization in Spatial Analysis for Planning

PLAN 608 Geographic Information Systems	3
PLAN 614 Retail Site Analysis	3
PLAN 615 Spatial Statistics	3
PLAN 616 Analytical Urban Geography	3
PLAN 618 Urban Demography	3
PLAN 619 Urban Geographic Informations Systems Applications	3
PLAN 624 Urban Transportation Planning	3
PLAN 628 Economic Conditions and Forecasting	3

Women's Studies (WMST)

www.louisville.edu/a-s/ws/

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 Women's Studies.

Graduate Program Faculty

Chair
Nancy Theriot, Professor of Women's Studies/History

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.

Affiliated Faculty

Professors
Ann Allen, History
Barbara Burns, Psychology
Thomas B. Byers, English
Julia Dietrich, English
Susan Griffin, English
Suzette Henke, English
Marianne Hutti, Nursing
Kathleen Kirby, Educational & Counseling Psychology
Cheryl Kolander, Health/Phys Ed/Sport Studies
Wendy Pfeffer, Classical and Modern Languages
Sydney Schultze, Classical and Modern Languages
Edwin S. Segal, Anthropology
Arthur Slavin, Humanities, Emeritus

Associate Professors
Mary C. Flannery, English
Rinda Frye, Theatre Arts
Patricia Gagne, Sociology
Bose Folasade Iyun, Pan African Studies
Susan Herlin, History/Pan African Studies
Mary Hums, Health/Phys Ed/Sport Studies
Eileen John, Philosophy
Mary Ann Stenger, Humanities

Assistant Professor
Susan Kelly, Sociology
Pamela 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 catalog for more information about Interdisciplinary Studies. After contacting 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 requirement 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 requirement may be waived if the student has had a theory course approved by the Women's Studies chairperson.

Course Descriptions Section Contents

Descriptions

Course Descriptions

Accounting

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 (3.0)
Prerequisites:ECON 600, CIS 675, MGMT 600, 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 (3.0)
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 (2.0)
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 (3.0)
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 (1.0)
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 (3.0)
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 (3.0)
Prerequisites: Admittance to the Masters 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 (6.0)
Prerequisites: 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 655 Special Topics in Accounting (3.0)
Prerequisites: Admittance to the Master of Accountancy Program.
Explores a variety of topics in accounting, auditing, or taxation.

ACCT 680 Special Topics in Accounting (1.0-6.0)
An advanced study of one or more selected topics or issues related to the study of Accounting.

ACCT 698 Research Seminar in Accounting (1.0-3.0)
Prerequisite: ACCT 600 and permission of departmental chair.

Anthropology

ANTH 546 Problems in Urban Anthropology (3.0)
Prerequisite: ANTH 201 or consent of 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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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.

Art (Creative)

ART 502 Directed Study in Painting (1.0-3.0)
Prerequisites: ART 301; BFA Candidacy or faculty consent.
3 lab, 3 independent study.
Experimentation on individual problems in painting. May be repeated up to a maximum of 12 hours.

ART 503 Art Workshop (0.5-3.0)
Prerequisite: Consent of instructor.
An intensive workshop in a specialized area of art.

ART 507 Art Education (3.0)
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 (3.0)
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 517 Directed Study in Drawing (1.0-3.0)
Prerequisites: ART 515 or 516; BFA Candidacy or faculty consent.
3 lab, 3 independent study.
Experimentation on individual problems in drawing.
May be repeated up to a maximum of 12 hours.

ART 518 Art Education Methods and Research II (3.0)
Prerequisite: Fine Arts majors only.
Art education methods and current research readings to satisfy Kentucky certification requirements for teachers in grades 7-12.

ART 527 Directed Study in Printmaking (1.0-3.0)
Prerequisites: ART 525; BFA Candidacy or faculty consent.
3 lab, 3 independent study.
Experimentation on individual problems in printmaking. May be repeated up to a maximum of 12 hours.

ART 549 BFA Fibers - Construction (3.0)
Prerequisites: BFA Candidacy and consent of instructor.
Concentrated studio projects within the BFA program. Directed study and critique on individual problems.

ART 550 BFA Painting (3.0)
Prerequisites: BFA candidacy and consent of instructor.
Concentrated studio projects within the BFA program. Directed study and critique on individual problems in painting. May be repeated to a maximum of 12 hours.

ART 552 Directed Study in Photography (1.0-3.0)
Prerequisites: ART 511 or 513; BFA Candidacy or faculty consent.
3 lab, 3 independent study.
Experimentation on individual problems in photography. May be repeated up to a maximum of 12 hours.

ART 556 Directed Study in Ceramics (1.0-3.0)
Prerequisites:ART 531; BFA Candidacy of faculty consent.
3 lab, 3 independent study.
Experimentation on individual problems in clay and ceramics. May be repeated up to a maximum of 12 hours.

ART 558 BFA Seminar (2.0)
Prerequisite: BFA candidacy.
Note: Fall only.
Discussion and critiques on selected topics in contemporary art.

ART 580 Professional Development in Interior Design (1.0)
Prerequisite: Junior standing.
Professional aspects of interior design, with emphasis on the role, purpose

and study of professional development.

ART 584 Directed Study in Fiber and Mixed Media Art (1.0-3.0)
Prerequisites: ART 581 or 582; BFA Candidacy or faculty consent.
3 lab, 3 independent study.
Experimentation on individual problems in fiber and mixed media art. May be repeated up to a maximum of 12 hours.

ART 590 Special Problems in Studio Art (3.0)
Prerequisites: BFA Candidacy; or faculty consent.
Advanced exploration of a particular theme, medium or combination of media outside the scope of established departmental curriculum, with emphasis on individual problems. May be repeated with different subtitles to a maximum of 12 hours.

ART 595 Independent Study (1.0-3.0)
Prerequisite: Minimum grade point average of 3.0 overall; minimum grade point average of 3.5 in the department, and at least 18 semester hours credit in the department.

ART 600 Graduate Seminar (1.0)
Prerequisites: Graduate Standing.
Note: Crosslisted with ARTH 600.
Reports, critiques, presentations and discussions on personal research and current topics in the visual arts.

ART 601 Workshop in Painting (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 Independent Study (1.0-15.0)
Prerequisite: Consent of instructor.
Credit according to achievement.

ART 644 Independent Study (1.0-15.0)
Refer to: ART 643

ART 645 Thesis Guidance (3.0)

ART 646 Thesis Guidance (3.0)
Refer to: ART 645

ART 682 Workshop in Fiber (3.0)
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

ARTH 540 Approaches to Study of Art History (3.0)
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 (3.0)
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 (1.0-3.0)
Prerequisite: Consent of instructor.

ARTH 544 Pan-African Art: Form and Content (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Survey of the history of ceramics. Emphasis on the evolution of technical innovations and styles.

ARTH 548 Museum Methods (3.0)
Refer to: ARTH 547

ARTH 551 Studies in Ancient Art (3.0)
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 (3.0)
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.

ARTH 553 Ancient Cities (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Special problems and advanced research in garden history and the development of spatial planning.

ARTH 599 Urban Design (3.0)
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 600 Graduate Seminar (1.0)
Prerequisites: Graduate Standing.
Note: Crosslisted with ART 600.
Reports, critiques, presentations and discussions on personal research and current topics in visual arts.

ARTH 641 Seminar in Art History (3.0)
Prerequisite: Consent of instructor.
Exploration of core problems in iconography, formal analysis, criticism, or historiography.

ARTH 643 Independent Study (1.0-12.0)
Prerequisite: Consent of instructor.
Credit according to achievement.

ARTH 644 Independent Study (1.0-12.0)
Refer to: ARTH 643

ARTH 645 Thesis Guidance (3.0)

ARTH 646 Thesis Guidance (3.0)
Refer to: ARTH 645

ARTH 647 Teaching Internship (2.0)
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 (3.0)
Prerequisite: Consent of instructor.
Advanced study on selected topics in ancient art and architecture.

ARTH 661 Special Problems in Medieval Art (3.0)
Prerequisite: Consent of instructor.

ARTH 671 Special Problems in Renaissance Art (3.0)
Prerequisite: Consent of instructor.

ARTH 681 Special Problems in Baroque Art (3.0)
Prerequisite: Consent of instructor.

ARTH 691 Special Problems in Modern Art (3.0)
Prerequisite: Consent of instructor.

ARTH 693 Special Problems in Modern Architecture (3.0)
Prerequisite: Consent of instructor.

ARTH 695 Special Problems in American Art (3.0)
Prerequisite: Consent of instructor.

ARTH 699 Special Problems in Urban History (3.0)
Prerequisite: Consent of instructor.
Advanced research in urban history from an architectural standpoint.

ARTH 745 Dissertation Research (1.0-12.0)
Prerequisite: Permission of dissertation director.

Anatomical Sciences and Neurobiology

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 (6.0)
Prerequisite: Permission from course director at least two weeks before beginning of course.
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 (1.0)
Presentations and discussions of individual research or topics of current anatomical interest throughout the year.

ASNB 611 Methods in Neurobiology (3.0)
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 labeling, electrophysiology, protein blotting and immunohistochemistry, cell culture microscopy, and basic molecular biology.

ASNB 612 Cellular Electrophysiology (3.0)
Prerequisites: Medical Neurosciences (615) or consent of the instructor.
To provide graduate students in the neurosciences with a solid foundation in electrophysiology, so they can apply electrophysiological concepts and methods to their research activities.

ASNB 614 Molecular Neuroscience (4.0)
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 (8.0)
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 (1.0-15.0)
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 ASNB 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 (3.0)
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 (1.0-15.0)

ASNB 620 Thesis (1.0-6.0)

ASNB 665 Techniques of Biological Electron Microscopy (3.0)
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 (3.0)
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 (6.0)
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 (5.0)
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.

Audiology

AUDI 600 Anatomy and Physiology for Communication Sciences (4.0)
Note: Cross-listed with CMDS 572.
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 604 Essential Techniques in Audiometry (3.0)
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 606 Audition and Acoustics (3.0)
Study of sound and it's measurement. Relationship of sound to human hearing. Speech acoustics and perception of speech.

AUDI 608 Anatomy and Physiology of the Auditory and Vestibular Systems (3.0)
Prerequisites: AUDI 600
Structure and function of the peripheral auditory system and central auditory pathways. Vestibular anatomy and physiology including vestibular-ocular reflex.

AUDI 610 Clinical Observation I and II (1.0)
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 (3.0)
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.

AUDI 614 Speech-Language Pathology for the Audiologist (3.0)
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 (2.0)
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 (2.0)
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 (2.0)
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 621 Audiologic Rehabilitation (3.0)
Management strategies for hearing loss beyond the hearing aid. Topics include auditory training, speech reading, communication repair strategies, counseling, adjustment to hearing aids, assistive listening devices and cochlear implants.

AUDI 622 Electrophysiologic Techniques in Audiology I (3.0)
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 (3.0)
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 (1.0)
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 626 Assessment and Management of Vestibular Disorders (2.0)
Study of the contribution of the vestibular system to balance and orientation. Technologies and procedures for assessing the dizzy patient. Management of vestibular disorders.

AUDI 628 Differential Diagnosis in Audiology (3.0)
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 (3.0)
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 (1.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
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 (3.0)
A broad study of the human aging process at the cellular, organ, system and social levels with respect to the hearing process. Study of the hearing-impaired elderly in a social context with consequences for case management.

AUDI 644 Communication Evaluation and Training in the Geriatric Population (3.0)
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 (3.0)
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 (6.0)
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 Prevention of Hearing Loss (2.0)
Focuses on the effect of noise on the auditory system, noise measurement and abatement, hearing conservation programming, OSHA standards, etc. The medical-legal aspects of hearing impairment.

AUDI 654 Neuroanatomy/ Neurophysiology and Central Auditory Processing (3.0)
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 (3.0)
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 (1.0-3.0)
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 (8.0)
Advanced clinical training under general direction of faculty member or preceptor in an external praticum site. Residency tailored to student interests. May involve travel and/or relocation. May be repeated.

AUDI 679 Independent Study in Audiology (1.0-6.0)
Individualized course with topics determined by student and instructor. May be repeated.

Business Education

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 (3.0)
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) (3.0)
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 (1.0-3.0)
Intensive study of current topics in business education. Opportunity will be available for independent research and writing.

Biochemistry

Note: *Biochemistry courses are scheduled according to the Health Sciences calendar.*

BIOC 545 Biochemistry I (3.0)
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; nucleotides; RNA,DNA and protein biosynthesis. 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 (3.0)
Prerequisite: BIOC 545/CHEM 545
Note: Cross-listed with CHEM 547.
Cellular metabolism of carbohydrates, lipids, amino acids and biomembrane phenomena, enzyme properties, kinetics, and control mechanisms; ligand binding. 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 (1.0-4.0)
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 (2.0)
Prerequisite: BIOC 645, 681 (recommended), or consent of instructor.
Structure and function of proteins, including protein folding.

BIOC 606 Biochemistry Seminar (1.0)
Both Fall and Spring semesters.

BIOC 611 Biochemical and Molecular Methods (3.0)
Analysis of modern biochemical and molecular biology methods including theory, practice, demonstration and data analysis of the purification and characterization of proteins and nucleic acids, centrifugation, spectroscopy, chromatography, electrophoresis, cloning, yeast genetics and recombinant DNA techniques.

BIOC 613 Biochemistry Laboratory (2.0-4.0)
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 (1.0-15.0)

BIOC 640 Principles of Biochemistry (5.0)
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 (4.0)
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 (4.0)
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; nucleotides; RNA, DNA and protein biosynthesis. 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 (4.0)
Prerequisites: BIOC 645/CHEM 645.
Note: Cross-listed with CHEM 647.
Cellular metabolism of carbohydrates, lipids, amino acids and nucleotides; enzyme properties, kinetics, and control mechanisms, ligand binding; 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 (3.0)
Prerequisites: BIOC 645 and BIOC 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 (2.0)
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 Cell Biology (3.0)
Prerequisite: BIOC 645 or consent of instructor.
Note: Cross-listed with ASNB 667, BIOL 667, MBIO 667 and VISC 667.
An advanced treatment of contemporary cell biology including membrane structure and function, cytoskeleron, signal, transduction, regulation of cell cycle, apoptosis, and the molecular mechanisms of cell differentiation.

BIOC 668 Molecular Biology (4.0)
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 (2.0)
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 (3.0)
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

BIOL 500 Plant Growth and Development (3.0)
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 501 Independent Study (1.0-3.0)
Prerequisite: Minimum grade point average of 3.0 overall; minimum grade point average of 3.5 in the department, and at least 18 semester hours credit in the department.

BIOL 502 Independent Study (1.0-3.0)
Refer to: BIOL 501

BIOL 506 Freshwater In vertebrates (4.0)
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.

BIOL 507 Aquatic Entomology (3.0)
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 (3.0)
Prerequisite: Unity of Life (BIOL 240) and Diversity of Life (BIOL 242).
Study of taxonomic theory and methods of nomenclature in zoology. Credit may not be earned in both 509 and 609. 3 hrs. lect.

BIOL 512 Endocrinology (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Introduction to Ecology (BIOL 301) and Introduction to Ecology Lab (BIOL 302) or consent of instructor. 2 lecture, 3 lab.
Evolution, morphology, diversity, ecology, and behavior of birds. Lab stresses field identification of birds. Credit may not be earned in both 514 and 614.
Fall, odd years.

BIOL 515 Environmental Physiology (3.0)
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 (4.0)
Prerequisites: BIOL 330 and BIOL 331 or equivalent and consent of instructor.
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 (3.0)
Prerequisite: Unity of Life (BIOL 240) and Diversity of Life (BIOL 242); Population and Community Ecology (BIOL 563) or Advanced Population and Community Ecology (BIOL 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 (3.0)
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 521 Stream Ecology (3.0)
Prerequisite: BIOL 302 or equivalent.
2 lecture, 2 lab or field.
Introduction to interactions among algae, invertebrates, fish, and their environments in streams. Focus on basic research methods with field and laboratory projects.Offered Fall of odd-numbered years.

BIOL 522 Aquatic Ecology (4.0)
Prerequisite: BIOL 301.
Ecological processes occurring in aquatic environments. Primary focus will be on lakes and reserviors with some discussion of stream, river and wetland processes. Credit may not be earned in both 522 and 622.Offered Fall of even-numbered years. 2 hrs. lect., 4 hrs. lab or field.

BIOL 523 Plant Physiology (4.0)
Prerequisite: Diversity of Life (BIOL 242), Diversity of Life (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 529 Mammalogy (3.0)
Prerequisites: BIOL 301 and BIOL 302 or consent of instructor.
2 lecture, 2 lab.
Systematics, evolution, behavior, ecology and distribution of mammals. Credit may not be earned in both BIOL 529 and BIOL 629.
Fall, even years.

BIOL 539 Medical Entomology (3.0)
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 (3.0)
Prerequisite: Diversity of Life (BIOL 242) and Cellular and Molecular Biology (BIOL 329).
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 (3.0)
Prerequisite:BIOL 330 or equivalent..
Advanced topics in genetics of prokaryotes and eukaryotes, including chromosome structure and function, and gene regulation, and genetic engineering. Credit may not be earned for both 542 and 642.

BIOL 544 Fisheries Management (4.0)
Prerequisite: Introduction to Ecology (BIOL 301) and Introduction to Ecology Lab (BIOL 302).
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.

BIOL 550 Biostatistics (3.0)
Prerequisite: Elements of Calculus (MATH 108) or Analytic Geometry and 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 (3.0)
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 (3.0)
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 Ecosytems Ecology (3.0)
Prerequisite: BIOL 301; an advanced ecology course 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. Offered Spring of even-numbered years.

BIOL 563 Population and Community Ecology (3.0)
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. Offered Spring of odd-numbered years.

BIOL 568 Conservation Biology (3.0)
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 (3.0)
Prerequisite: The Diversity of Life (BIOL 242), The Diversity of Life: Laboratory (BIOL 243), 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 (1.0-4.0)
Contents to be indicated in schedule of courses.

BIOL 584 Interdisciplinary Frameworks in Environmental Science and Technology (3.0)
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 (3.0)
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 (3.0)
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 (4.0)
Prerequisite: The Diversity of Life (BIOL 242)/The Diversity ofLife: Laboratory (BIOL 243) 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 606 Advanced Freshwater Invertebrates (5.0)
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 (4.0)
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 (3.0)
The theory and practice of modern techniques of measurement in micro- and macro-ecosystems. 3 hrs. lect.

BIOL 609 Advanced Systematic Zoology (4.0)
Prerequisite: Unity of Life (BIOL 240) and Introduction to Ecology (BIOL 301).
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 (4.0)
Prerequisite: Introduction to Ecology (BIOL 301).
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 (4.0)
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 (4.0)
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.

BIOL 614 Advanced Ornithology (4.0)
Prerequisites: BIOL 301 and BIOL 302 or consent of instructor.
Evolution, morphology, diversity, ecology and behavior of birds.Credit may not be earned in both BIOL 514 and BIOL 614. Fall, odd years.2 hrs.lect., 3 hrs. lab.

BIOL 615 Advanced Environmental Physiology (4.0)
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 (5.0)
Prerequisites: BIOL 330 & BIOL 331 or equivalent & consent of instructor.
An advanced course in laboratory techniques to study bacteria and fungi at the molecular level. Emphasis on up-to-date in vivo and invitro 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. Recommended : BIOL 355 & 542 or 642.

BIOL 617 Advanced Molecular Biology (4.0)
Prerequisite: Cellular and Molecular Biology (BIOL 329) or Genetic & Molecular Biology (BIOL 330), 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 (4.0)
Prerequisites: Diversity of Life (BIOL 242) and Introduction to Ecology (BIOL 301); 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 (3.0)
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 (3.0)
Prerequisite: Diversity of Life (BIOL 242) 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 (4.0)
Prerequisites: BIOL 330 and BIOL 331 or equivalent and consent of instructor.
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. Recommended : BIOL 355 and 542 or 642.

BIOL 622 Advanced Aquatic Ecology (5.0)
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 lect., 4 hrs. lab or field. Offered Fall of even-numbered years.

BIOL 623 Advanced Plant Physiology (5.0)
Prerequisite: Diversity of Life (BIOL 242), Diversity of Life Lab (BIOL 243) and Cellular and Molecular Biology (BIOL 329).
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 629 Advanced Mammalogy (4.0)
Prerequisites: BIOL 301 and BIOL 302 or consent of instructor.
Systematics, evolution, behavior, ecology, and distribution of mammals. Credit may not be earned in both BIOL 529 and BIOL 629. Fall, even years. 2 hrs.lect., 2 hrs lab.

BIOL 631 Advanced Cellular Physiology (5.0)
Prerequisite: Cellular and Molecular Biology (BIOL 329).
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 633 Advanced Physiological Plant Ecology (5.0)
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 (4.0)
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 (4.0)
Prerequisite: Diversity of Life (BIOL 242) and Cellular and Molecular Biology (BIOL 329).
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 (4.0)
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.

BIOL 642 Advanced Gene Structure and Function (4.0)
Prerequisites: BIOL 330 or eqiuvalent.
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 644 Advanced Fisheries Management (5.0)
Prerequisite: Introduction to Ecology (BIOL 301) and Introduction to Ecology Lab (BIOL 302).
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 (4.0)
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 651 Bioststistics II (3.0)
Prerequisites: BIOL 650
Advanced Biostatistics, involves interpretation of experimental data using statistical software. Topics include Experimental design and ANOVA, ANCOVA, MANOVA, Logistic analysis, Logistic regression, and Log linear models.

BIOL 655 Advanced Microbial Ecology (4.0)
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 (4.0)
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 (5.0)
Prerequisite: Diversity of Life (BIOL 242) and Introduction to Ecology (BIOL 301).
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 (4.0)
Prerequisites: 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 required for students enrolling in 662. Credit may not be earned in both 562 and 662.3 hrs. lect..Offered Spring of even-numbered years.

BIOL 663 Advanced Population and Community Ecology (4.0)
Prerequisites: 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. Offered Spring of odd-numbered years.

BIOL 664 Research Methods in Ecology (3.0)
Prerequisite: Introduction to Ecology (BIOL 301).
Introduction to experimental design, data collection and quantitative analyses. Field and laboratory research, statistical tools and critical evaluation data.

BIOL 666 Scientific Writing (3.0)
Graduate level course in scientific writing (publications, grant proposals, conference presentations, job applications) for Biology/Environmental Biology students.

BIOL 668 Advanced Conservation Biology (4.0)
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 (3.0)
Prerequisite: Diversity of Life (BIOL 242), Diversity of Life: Laboratory (BIOL 243), 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 (1.0-4.0)
Topics to be indicated in schedule of courses.

BIOL 684 Interdisciplinary Frameworks in Environmental Science and Technology (3.0)
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 (1.0)
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 (1.0-6.0)
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 (1.0-6.0)
Prerequisite: Consent of instructor.
Independent field or laboratory research on a problem not related to thesis or dissertation.

BIOL 692 Independent Study (1.0-6.0)
Prerequisite: Consent of instructor.
Independent library research on a problem not related to the thesis or dissertation.

BIOL 700 Dissertation Research (1.0-9.0)
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.

Computer Engineering & Computer Science

Computer Engineering and Computer Science courses are open only to students who have been admitted to the Computer Engineering and Computer Science program, or with permission of the Computer Engineering and Computer Science Department Chair.

CECS 502 Seminar in Computer Engineering and Computer Science (1.0)
Prerequisite: Fourth-year standing in CECS.
An oral presentation and a written report to a CECS topic of current interest are required. Study and presentations of the ethical, legal and societal consequences and responsibilities of engineering and technological decisions.

CECS 504 Automata Theory (3.0)
Prerequisite: Discrete Structures (CECS 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.

CECS 506 Modeling and Analysis of Engineering Systems (3.0)
Prerequisite: Linear Algebra for Engineering (CECS 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.

CECS 508 Numerical Analysis I (3.0)
Prerequisite: Engineering Computation (CEE 330).
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.

CECS 510 Computer Design (3.0)
Prerequisite: Logic Design (ECE 210) and assembly language experience as covered by Computer Interfacing (ECE/CECS 412), Introduction to Computer Science and Engineering, CECS 301, or experience acceptable to the instructor.
Corequisite: ECE 511.
Note: Cross-listed with CSE/ECE 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.

CECS 516 Fundamentals of Computer Communications and Networks (3.0)
Prerequisite: Probability and Statistics for Engineers (CECS 360), and Computer Interfacing (CECS 412).
Note: Cross-listed with ECE 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.

CECS 522 Performance Evaluation of Computer Systems (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 360) and Design of Operating Systems (CECS 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.

CECS 525 Microcomputer Design (4.0)
Prerequisite: Computer Interfacing (ECE/CECS 412) or consent of instructor.
Note: Cross-listed with ECE 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.

CECS 530 Design of Compilers (3.0)
Prerequisite: Design of Operating Systems (CECS 420).
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.

CECS 542 Computer Control and Real Time Programming (3.0)
Prerequisites: ECE 252, CECS 310, EAC 205 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.

CECS 545 Artificial Intelligence (3.0)
Prerequisite: Design of File Structures (CECS 335) and Use of Selected Programming Languages: LISP (CECS 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.

CECS 546 Knowledge Engineering and Expert Systems (3.0)
Prerequisites: CECS 302.
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.

CECS 550 Software Engineering (3.0)
Prerequisite: Design of Operating Systems (CECS 420) and Object Oriented Design (CECS 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.

CECS 563 Experimental Design in Engineering (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 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.

CECS 590 Special Topics in Computer Engineering and Computer Science (1.0-6.0)
Devoted to topics which usually are not treated in detail in the general courses.

CECS 608 Advanced Design of Operating Systems (3.0)
Prerequisite: Design of Operating Systems (CECS 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.

CECS 609 Hypertext and Multimedia Processing (3.0)
Prerequisite: Design of File Structures (CECS 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.

CECS 611 Computer Architecture (3.0)
Prerequisite: CECS 510.
Note: Cross-listed with CSE/ECE 611.
Classification of computer designs. PMS and ISP descriptions. Study of major systems of current and historical interest.

CECS 616 Communication and Network Architectures (3.0)
Prerequisite: CECS 516 or equivalent.
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.

CECS 619 Design and Analysis of Computer Algorithms (3.0)
Prerequisite: Design of File Structures (CECS 335) and Discrete Structures (CECS 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.

CECS 622 Simulation and Modeling of Discrete Systems (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 360).
Engineering design of simulation languages and simulators, discrete stochastic systems, issues in large scale simulation studies and engineering evaluation methods.

CECS 624 Advanced Simulation (3.0)
Prerequisite: CECS 622.
Selected advanced topics in computer and software architectures, algorithms and models in simulation.

CECS 627 Digital Image Processing (3.0)
Prerequisites: CECS 506 or ECE 420 or faculty consent.
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.

CECS 628 Computer Graphics (3.0)
Prerequisite: Elementary Linear Algebra Methods in Engineering (CECS 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.

CECS 629 Distributed System Design (3.0)
Prerequisite: Design of Operating Systems (CECS 420) and CECS 516.
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.

CECS 630 Data Base Design (3.0)
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.

CECS 633 Computer Vision (3.0)
Prerequisite: CECS 627, or ECE 618, or consent of instructor.
Note: Cross-listed with ECE 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.

CECS 640 Internet Application Design and Development (3.0)
Prerequisites: CECS 516 and basic knowledge of Java and object oriented design.
Java and network communications, applets, servlets, and JSP, database access, remote method envocation, activatable RMI, Java security, COBRA, XML, and e-commerce applications.

CECS 645 Advanced Artificial Intelligence (3.0)
Prerequisite: CECS 545.
Advanced topics in artificial intelligence from current research publications. Oriented toward second year graduate students. Major project required.

CECS 650 Advanced Software Engineering (3.0)
Prerequisite: CECS 550.
Selected formal methods, algorithms and models applicable in the software engineering process life-cycle.

CECS 690 M.S. Thesis in Computer Science (1.0-6.0)
Experimental and/or theoretical research to be presented in thesis.

CECS 693 Independent Study in Computer Engineering and Computer Science (1.0-6.0)
Note: Chair Approval is required.

CECS 694 Special Topics in Computer Engineering and Computer Science (1.0-6.0)
Devoted to topics which usually are not treated in detail in the general course.

CECS 695 Computer Engineering and Computer Science Seminar (1.0)

CECS 697 Master of Engineering Thesis in Computer Engineering and Computer Science (1.0-8.0)
Prerequisite: Graduate/Professional standing.
Note: This course may be repeated for a maximum total of eight semester hours.
A candidate for the Master of Engineering degree, specializing in the field of Computer Engineering and Computer Science, is required to perform a study, design, or investigation under the direction of a faculty member. A written dissertation is required to be presented and defended orally and submitted to the faculty for approval.

Civil and Environmental Engineering

CEE 503 Fundamentals of Engineering Exam Review (2.0)
Prerequisite: 4th Year Standing.
Review of topics covered on eight-hour NCEEES Fundamentals of Engineering supplied- references examination. Not to be counted towards meeting the requirements for a degree.

CEE 520 Design of Structural Systems (3.0)
Prerequisite: CEE 421, 422 & 551.
Introduction to the design of structural systems. Model building codes. Material, structural system and foundation system selection. Design of connections. Economic, detailing constructability and erection issues. Preparation of engineering drawings; review of shop drawing.

CEE 522 Fundamentals of Prestressed Concrete (3.0)
Prerequisite: Matrix Structural Analysis (CEE 420) and Fundamentals of Concrete Design (CEE 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 530 Construction Materials (3.0)
Prerequisite: CEE 254, CEE 255 and CEE 450.
Properties of construction materials such as cement, concrete, asphalt, and structural elastomers. Design of Portland cement concrete and asphaltic concrete mixes.

CEE 532 Experimental Stress Analysis (3.0)
Prerequisite: Construction Materials (CEE 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 (3.0)
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 (3.0)
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 (4.0)
Prerequisite: Geomechanics (CEE 450).
Laboratory testing of soil mechanical properties; index testing; testing for permeability, compressibility, and shear strength.

CEE 551 Foundation Engineering (3.0)
Prerequisite: Geomechanics (CEE 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 (3.0)
Prerequisite: Geomechanics (CEE 450).
Earth pressure calculation: theory and practice. Design techniques for retaining walls, reinforced earth and soil nailing.

CEE 560 Traffic Engineering (3.0)
Prerequisite: Transportation Systems Engineering (CEE 360).
Characteristics of the vehicle, the driver, and the traffic stream. Highway and intersection capacity, theory of traffic flow, parking, traffic safety.

CEE 561 Environmental Analysis of Transportation Systems I (3.0)
Prerequisite: CEE 360.
An examination of the various impacts that transportation systems and projects may have on the natural and human environment. Areas of study include noise, air quality, and water resources. Relevant laws and regulations, as well as quantitative prediction models, are thoroughly considered.

CEE 562 Geometric Design of Highways (3.0)
Prerequisites: CEE 560.
Development of concepts of geometric design for rural and urban highways. Topics include: design criteria; sight distance; horizontal alignment; vertical alignment, cross-section elements; highway types; intersection design; interchange design; grade separation; highway safety; and drainage design. These concepts will then be applied using state-of-the art proprietary design software.

CEE 570 Applied Hydraulics (3.0)
Prerequisite: CEE 370.
Application of basic principles of hydraulic engineering to analysis of flow in floodways, through bridge openings, culverts, and spillways. Analysis of stable channel design is also considered. Commonly used computer programs are utilized to design structures in floodways.

CEE 571 Applied Hydrology (3.0)
Prerequisite: CEE 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 572 Open Channel Hydraulics (3.0)
Prerequisite: CEE 370.
Application of basic principles of hydraulics to open channel flow. Theory and analysis of critical, uniform and gradually varied flow and computer analysis. Select topics in rapidly varied and unsteady flow.

CEE 573 Groundwater Hydrology (3.0)
Prerequisite: Geomechanics (CEE 450) and Surface Water Hydrology (CEE 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 (1.0-4.0)
Prerequisite: Consent of instructor.

CEE 604 Interaction of Soils and Structure (3.0)
Prerequisite: Fundamentals of Concrete Design (CEE 421), Fundamentals of Steel Design (CEE 422), and Foundation Engineering (CEE 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 (3.0)
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 (3.0)
Prerequisite: Matrix Structural Analysis (CEE 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.

CEE 622 Theory of Plates and Shells (3.0)
Prerequisite: CEE 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 (3.0)
Prerequisite: CEE 421, 422 & 625.
Design of earthquake resistant steel, concrete, and masonry structures. Introduction to time history, modal analysis and pushover analysis. Model code seismic design provisions. Ductility concepts.

CEE 624 Nonlinear Material Behavior (3.0)
Prerequisite: Construction Materials (CEE 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 (3.0)
Prerequisite: Matrix Structural Analysis (CEE 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 (3.0)
Prerequisite: Earth Pressures and Retaining Structures (CEE 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 (3.0)
Prerequisite: Geomechanics (CEE 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 (3.0)
Prerequisite: Geomechanics (CEE 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 (3.0)
Prerequisite: Transportation Systems Engineering (CEE 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 (3.0)
Prerequisite: Environmental Analysis of Transportation Systems I (CEE 561).
A continuation of CEE 561, with in-depth advanced study of air quality and noise levels resulting from transportation improvements. CEE 561 is not available for credit toward Graduate School degrees.

CEE 662 Airport Planning & Design (3.0)
Prerequisite: Transportation Systems Engineering (CEE 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 (3.0)
Prerequisite: CEE 560.
A continuation of CEE 560, with an emphasis on mathematical and computer techniques to solve traffic problems.

CEE 664 Fundamentals of Intelligent Transportation Systems (3.0)
Prerequisites: CEE 560 & 660.
Overview of the complete Intelligent Transportation Systems field. Elements of traffic flow theory, incident/emergency management, dynamic route guidance, in-vehicle systems, and traffic signal systems.

CEE 665 Pavement Design (3.0)
Prerequisite: Transportation Systems Engineering (360) and Geomechanics (CEE 450).
Design of flexible and rigid pavements, base courses, and subgrades. Effects of loading on pavement life.

CEE 670 Advanced Hydraulics (3.0)
Prerequisite: Engineering Hydraulics (CEE 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 (3.0)
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 (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 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 (3.0)
Prerequisites: CEE 470 & IE 360.
Advanced concepts for studying hydrologic processes; theory of linear hydrologic systems; conceptual models for modeling watershed rainfall-runoff response including geomorphological approaches.

CEE 674 Water Resources Systems (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Engineering Hydraulics (CEE 370).
Sediment transport theory; overland erosion; alluvial streams; analysis, prediction, and control of river characteristics; local scour at river structures.

CEE 677 Groundwater Modeling (3.0)
Prerequisite: Engineering Hydraulics (CEE 370) and CEE 573.
Mathematical and numerical modeling of groundwater and pollution transport.

CEE 680 Civil Engineering Capstone Design (3.0)
Prerequisite: Graduate/Professional School standing.
A capstone Civil Engineering course to include elements of geotechnical, structural, transportation, and water resources engineering in a comprehensive design project.

CEE 690 M.S. Thesis in Civil Engineering (1.0-6.0)
Experimental and/or theoretical research to be presented in thesis for degree requirement.

CEE 692 Interactions of the Environment and Society (3.0)
Prerequisites: Permission of instructor.
A broad treatment of environmental problems especially tailored to elementary, middle and high school teachers, emphasizing the social and economic impact of environmental problems on our society. Special attention will be devoted to developing educational portfolios specific to environmental problems for possible incorporation into elementary, middle, and high school course context. Topics of discussion will include water quality, air quality, solid waste disposal, environmental law, noise pollution, and environmental health planning.

CEE 693 Independent Study in Civil Engineering (1.0-6.0)

CEE 694 Special Topics in Civil Engineering (1.0-6.0)

CEE 695 Civil Engineering Seminar (1.0)

CEE 697 Master of Engineering Thesis in Civil Engineering (1.0-6.0)
Prerequisite: CEE 402 and graduate/professional school standing.
A candidate for the Master of Engineering degree, specializing in the field of civil 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 and defended orally and submitted to the faculty for approval.

CEE 698 CE PhD Seminar (3.0)
Prerequisites: Permission of the chair.
Current literature in the field of civil engineering; extensive student presentations on research projects with interaction and feedback from students and faculty; guest speakers.

CEE 699 CE Phd Research (1.0-18.0)
Prerequisites: Permission of dissertation director.
Original research activity in an appropriate civil engineering discipline, under the direction of a Civil Engineering graduate faculty member.

Chemical Engineering

CHE 502 Biochemical Engineering (3.0)
Prerequisite: For undergraduate students, second-year professional school standing or faculty consent is required.
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, including system design.

CHE 509 Technology and the Environment (3.0)
Prerequisites: Senior level standing.
Note: Cross-listed with CEE 509.
This course is intended to provide 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. Not only will the course cover the basic scientific and engineering principles required to understand natural and designed systems, but will present 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 practices.

CHE 532 Advanced Material Science (3.0)
Prerequisite: For undergraduate students, Graduate/professional school standing is required.
Advanced study of materials science. Topics may include 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; science of thin films; or topics selected by the instructor.

CHE 533 Chemical Engineering Safety and Health (3.0)
Prerequisite: For undergraduate students, 4th year standing in engineering or chemistry or equivalent is required.
Overview of regulations and industrial practices, emphasizing chemical hazards, including: industrial hygiene, toxicology, controls and hazards analysis. Safety considerations in process design.

CHE 534 Industrial Waste Management (3.0)
Prerequisite: For undergraduate students, 2nd year professional school standing is required.
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. Design of waste treatment facilities.

CHE 535 Pollution Prevention (3.0)
Prerequisite: For undergraduate students, 4th year undergraduate or 1st year graduate level status in engineering or science, or equivalent is required.
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 (3.0)
Prerequisite: Kinetics & Chemical Reactors (CHE 441), or consent of instructor.
Kinetic expressions are developed for several polymer reaction mechanisms including chain, step, ionic and emulsion reactions; copolymerization; polymer reaction engineering; molecular weight distributions; structural considerations; design considerations.

CHE 551 Polymer Science (3.0)
Prerequisite: For undergraduate students, second-year professional school standing is required.
Introduction to polymer science and engineering. Polymer synthesis, kinetics, structure, and properties; commercial polymers; polymer processing; equipment design.

CHE 562 Process Control Laboratory (1.0)
Prerequisite or corequisite: Elements of Process Control (CHE 461).
A laboratory course demonstrating computer simulation and the characteristics of sensing and control devices and their interactions when incorporated into process control systems.

CHE 572 Plant Process and Project Design (3.0)
Prerequisite: For undergraduate students, second year professional standing or CHE 471 is required.
The design and economic evaluation of a chemical plant, from process definition and flow sheet construction to a cash position diagram and measures of profitability.

CHE 574 Techniques of Research (3.0)
Prerequisite: For undergraduate students, second- year professional standing is required.
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 (3.0)
A comprehensive study of physical and chemical equilibrium, with special emphasis on nonideality.

CHE 612 Nonequilibrium Thermodynamics (3.0)
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 (3.0)
An integrated study of momentum, thermal energy, and mass transport by molecular and convective mechanisms, with and without generation, for steady-state and unsteady-state conditions, in laminar, boundary-layer, or turbulent flow. Molecular theories of transport properties.

CHE 621 Transport Phenomena II (3.0)
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 (3.0)
Principles and applications of the rheology of polymeric materials. Kinematics of shear and extentional flows. Properties of polymer melts; experimental rheometry. Property predictions based on a variety of generalized Newtonian, linear viscoelastic, co-rotational, and co-deformational models.

CHE 631 Homogeneous Fluid Dynamics (3.0)
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 approximations; non-Newtonian fluids.

CHE 632 Heterogeneous Flow (3.0)
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.

CHE 633 Heat Transfer (3.0)
Advanced problems in the fields of conductive and convective heat transfer.

CHE 637 Advanced Stagewise Processes (3.0)
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 (3.0)
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 (3.0)
A study of catalytic reaction mechanisms and solid catalysts with applications to cracking, reforming, hydrotreatment of fuels, synthesis gas conversion and partial oxidation reactions. Design of catalysts and catalytic reactors for specific applications.

CHE 641 Advanced Reactor Design (3.0)
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.
Extensive application of digital computers.

CHE 650 Membrane Separations (3.0)
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. Design of membranes, membrane modules and membrane separation processes.

CHE 653 Polymer Processing (3.0)
Introduction to polymer melt rheology. Simple model flows. Analysis, modeling, design 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 (3.0)
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 (3.0)
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 (3.0)
A combined laboratory and seminar course involving advanced process-control experiments and simulation procedures with the necessary concomitant discussion.

CHE 662 Advanced Process Control (3.0)
Advanced control system design and implementation; feed-forward, cascade, adaptive, multivariable, and constraint control systems; computer process control.

CHE 663 Distillation Dynamics and Control (3.0)
Multicomponent calculations and design of distillation units. Automatic control of these units, sensitivity analysis in control strategy, and dynamic mathematical modeling and simulation of the columns and accessories, including design considerations.

CHE 686 Chemical Engineering Analysis (3.0)
Mathematical modeling of chemical engineering phenomena leading to total and partial differential equations requiring solution by use of series, transforms, and digital computer techniques. Applications to design and analysis of chemical engineering processes.

CHE 687 Modeling and Simulation of Chemical Processes (3.0)
Prerequisite or corequisite: Consent of instructor.
Techniques of computer-aided process modeling and design, primarily using ASPEN PLUS, which simulates the 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.

CHE 690 M.S. Thesis in Chemical Engineering (1.0-6.0)
Experimental and/or theoretical research to be presented in thesis for degree requirement.

CHE 693 Advanced Research in Chemical Engineering (1.0-12.0)

CHE 694 Special Topics in Chemical Engineering (1.0-6.0)

CHE 695 Chemical Engineering Seminar (1.0-4.0)

CHE 696 Independent Study in Chemical Engineering (1.0-6.0)

CHE 697 Master of Engineering Thesis in Chemical Engineering (1.0-8.0)
Prerequisite: Graduate/professional school standing.
A candidate for the Master of Engineering degree, specializing in the field of Chemical Engineering, is required to perform a study, design, or investigation under the direction of a faculty member. A written dissertation is required to be presented and defended orally and submitted to the faculty for approval. This course must be repeated for a minimum total of 8 semester hour credits to satisfy minimum M.Eng. requirements.

CHE 698 Chemical Engineering Project Mangement (3.0)
Prerequisites: Graduate/Professional School standing.
Presents the fundamentals of proposal writing, business plan requirements, literature and background investigation, and project management once a project is funded.

CHE 699 Chemical Engineering Project Communications (3.0)
Prerequisites: Graduate/Professional School standing, ChE 698.
Students accomplish either a written proposal/business plan or a written project report. An oral presentation of the proposal or project reports is also required.

Chemistry

CHEM 501 Independent Study (1.0-3.0)
Prerequisite: Minimum grade point average of 3.0 overall; minimum grade point average of 3.5 in the department, and at least 18 semester hours credit in the department.

CHEM 503 Special Topics in Chemistry (1.0-3.0)
Prerequisite: As required by topic.
Not applicable toward graduate degree in chemistry.

CHEM 515 Inorganic Chemistry (3.0)
Prerequisite: CHEM 342 and concurrent enrollment in CHEM 441 or 461.
Descriptive and theoretical chemistry of the elements.

CHEM 528 Contemporary Methods of Synthesis and Analysis I (2.0)
1 lecture, 1 lab.
Prerequisites: CHEM 527, concurrent registration in CHEM 515.
A discovery-based approach to the solution of problems encountered in chemical synthesis and analysis.

CHEM 529 Contemporary Methods of Synthesis and Analysis II (2.0)
1 lecture, 1 lab.
Prerequisites: CHEM 528.
A discovery-based approach to the solution of problems encountered in chemical synthesis and analysis.

CHEM 545 Biochemistry I (3.0)
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 547 Biochemistry II (3.0)
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 (3.0)
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.

CHEM 557 Bio-Organic Phenomena (3.0)
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 Advanced Physical Chemistry (3.0)
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 562 Advanced Physical Chemistry (3.0)
Refer to: CHEM 561

CHEM 576 Polymer Chemistry (3.0)
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 Chemistry for Teachers I (3.0)
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 592 Chemistry for Teachers II (3.0)
Refer to: CHEM 591

CHEM 620 Optical Spectrochemical Methods of Analysis (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: CHEM 525 and 526.
Electronic aspects of chemical instrumentation; analog and digital circuitry; computer interfacing and software.

CHEM 625 Advanced Analytical Chemistry (3.0)
Prerequisite: CHEM 525 and 526.
A survey of theoretical and practical aspects of modern methods of analysis.

CHEM 629 Special Topics in Analytical Chemistry (1.0-3.0)
Prerequisite: CHEM 525 and 526, or consent of instructor.
Recent developments in selected areas of analytical chemistry.

CHEM 632 Chemical Education (3.0)
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 (4.0)
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 (4.0)
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 Independent Study (1.0-3.0)
Credit according to achievement; limited to 3 hrs. per semester

CHEM 652 Independent Study (1.0-3.0)
Refer to: CHEM 651

CHEM 653 Main Group Chemistry (3.0)
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 (3.0)
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 Special Topics in Inorganic Chemistry (1.0-3.0)
Prerequisite: CHEM 515.
Current problems in inorganic chemistry. 3 hrs. lect.

CHEM 656 Special Topics in Inorganic Chemistry (1.0-3.0)
Refer to: CHEM 655

CHEM 661 Chemical Thermodynamics (3.0)
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 Special Topics in Physical Chemistry (1.0-3.0)

CHEM 666 Special Topics in Physical Chemistry (1.0-3.0)
Refer to: CHEM 665

CHEM 667 Reaction Kinetics (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 Special Topics in Organic Chemistry (1.0-3.0)
Prerequisite: One year of organic chemistry.
Current problems in organic chemistry; organometallic chemistry; free radical reactions; carbohydrates and nucleosides; peptides. 3 hrs. lect.

CHEM 676 Special Topics in Organic Chemistry (1.0-3.0)
Refer to: CHEM 675

CHEM 678 Advanced Organic Chemistry: General Survey (3.0)
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 679 Advanced Organic Chemistry: General Survey (3.0)
Refer to: CHEM 678

CHEM 681 Modern Biochemistry I (3.0)
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 (3.0)
Prerequisite: CHEM 681 or consent of instructor.
Carbohydrate, lipid, protein, and nucleic acid metabolism; endocrine control of metabolism and physiological activities.

CHEM 683 Statistical Thermodynamics (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 Research (1.0-15.0)
Prerequisite: 30 semester hours of undergraduate chemistry.

CHEM 692 Research (1.0-15.0)
Refer to: CHEM 691

CHEM 695 Seminar (1.0)
Maximum credit allowed is 3 semester hours. Required of all graduate students during residency.

Computer Information Systems

CIS 655 Computer Ethics and Social Issues (3.0)
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 (3.0)
Prerequisite: Computer Concepts for Managers (CIS 500) or equivalent.
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 (1.0-6.0)
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 (1.0-6.0)
Prerequisite: Permission of departmental chair.

Commercial Law

CLAW 600 Legal Aspects of Business (3.0)
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 (3.0)
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 (3.0)
A focused study of selected issues in the regulation of business. Content varies at the discretion of the instructor.

Communicative Disorders

CMDS 545 Survey of Communication Processes and Disorders (3.0)
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 (4.0)
Prerequisite: CMDS 545.
Overview of historical and current philosophies in the rehabilitation of hearing impaired persons, including psychological, sociological, educational and vocational aspects.

CMDS 567 Fundamentals of Speech and Hearing Science (3.0)
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 (1.0)
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 602 Articulation/ Phonology (3.0)
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 (4.0)
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 (1.0-4.0)
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 (1.0-4.0)
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 620 Neurological Disorders of Speech Production (3.0)
Prerequisite: CMDS 572.
Study of disorders resulting in flaccid, spastic, mixed, ataxic, hypokinetic, or hyperkinetic dysarthria. Covers diagnostic and treatment strategies.

CMDS 652 School Age Language and Phonology Intervention (3.0)
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 661 Assessment of Childhood Language Disorders (3.0)
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 (4.0)
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 (3.0)
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 (3.0)
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 (1.0)
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 (3.0)
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 690 Dysphagia (3.0)
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 (1.0-3.0)
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 (3.0)
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 (1.0-3.0)
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 (1.0-6.0)

Communication

COMM 510 Special Topics in Speech (1.0-3.0)
Prerequisite: Faculty consent. Advanced study in specific areas in speech and forensics. May be repeated under different subtitles.

COMM 520 Computer-Mediated Communication (3.0)
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 (3.0)
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 (1.0-3.0)
Prerequisite: Consent of instructor Practical work in speech. Pass/Fail grading

COMM 610 Problems of Public Discourse (3.0)
Prerequisite: Consent of instructor Surveys the chief theories and disputes about public discourse, public knowledge, and decision-making.

COMM 620 Organizational Communication (3.0)
Prerequisite: Consent of instructor Theoretical and applied studies of communication within organizations and between organizations and their publics.

COMM 630 Communication and Multiculturalism (3.0)
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 (3.0)
Prerequisite: Consent of instructor. Studies public communication campaigns, e.g., health information and policy campaigns.

COMM 650 Corporate Communication (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Examination of topics not covered in regularly-scheduled courses.

Computer Science & Engineering

CSE 504 Automata Theory (3.0)
Prerequisite: Discrete Structures (CECS 410).
Note: Cross-listed with CECS 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 (3.0)
Prerequisite: Logic Design (ECE 210) and assembly language experience as covered by Computer Interfacing (ECE/CECS 412), Introduction to Computer Science and Engineering (CECS 301), or experience acceptable to the instructor.
Corequisite: CSE 511.
Note: Cross-listed with EE/CECS 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 (1.0)
Prerequisite: Logic Design (ECE 210).
Corequisite: CSE 510.
Note: Cross-listed with ECE 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.

CSE 515 Introduction to VLSI Systems (3.0)
Prerequisite: Logic Design (ECE/CECS 210).
Corequisite: ECE/CECS 510, and ECE 514, or consent of instructor.
Note: Cross-listed with ECE 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 (3.0)
Prerequisite: Design of Operating Systems (CECS 420), CSE/CECS 504.
Note: Cross-listed with CECS 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 (3.0)
Prerequisite: Design of File Structures (CECS 335) and Use of Selected Programming Languages-LISP (CECS 303).
Note: Cross-listed with CECS 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 (3.0)
Prerequisite: Design of Operating Systems (CECS 420).
Note: Cross-listed with CECS 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 (3.0)
Prerequisite: Design of Operating Systems (CECS 420).
Note: Cross-listed with CECS 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 (3.0)
Prerequisite: Logic Design (ECE/CECS 210).
Note: Cross-listed with ECE/CECS 610.
Models and elementary properties of sequential machines, sequential machine compatibility and equivalence, state assignment and state minimization.

CSE 611 Computer Architecture (3.0)
Prerequisite: ECE/CECS 510.
Note: Cross-listed with ECE/CECS 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 (3.0)
Prerequisite: Design of File Structures (CECS 335) and Discrete Structures (CECS 410).
Note: Cross-listed with CECS 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 (3.0)
Prerequisite: Design of File Structures (CECS 335).
Note: Cross-listed with CECS 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 (3.0)
Prerequisite: Active Network Design I (ECE 421) or consent of instructor.
Corequisite: ECE 631.
Note: Cross-listed with ECE 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 (1.0-24.0)
Prerequisite: Consent of advisor.

CSE 694 Special Topics in Computer Science & Engineering (1.0-6.0)
Prerequisite: Consent of advisor.

CSE 695 Seminar in Computer Science & Engineering (1.0)
Prerequisite: Consent of advisor.
Pass/Fail grading.

CSE 696 Independent Study in Computer Science & Engineering (1.0-6.0)
Prerequisite: Consent of advisor.

CSE 790 Special Topics in Computer Science & Engineering (1.0-6.0)
Devoted to advanced topics that are not treated in the general courses. Topics will be announced in the Schedule of Courses.

Electrical and Computer Engineering

ECE 500 Special Topics in Electrical Engineering (1.0-6.0)

ECE 503 Fundamentals of Engineering Examination Review (2.0)
Prerequisite: 4th Year Standing.
Review of topics covered on eight-hour NCEES Fundamentals of Engineering supplied-reference examination. Not to be counted towards meeting the requirements for a degree.

ECE 505 Graduate-Professional Project in Electrical Engineering (1.0-6.0)
Prerequisite: Approval of a faculty sponsor.

ECE 510 Computer Design (3.0)
Prerequisite: Logic Design (ECE 210) and assembly language experience as covered by Computer Interfacing (ECE/CECS 412), Introduction to Computer Science and Engineering (CECS 230), or experience acceptable to instructor.
Corequisite: ECE 511.
Note: Cross-listed with CSE/CECS 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.

ECE 511 Computer Design Laboratory (1.0)
Prerequisite: Logic Design (ECE 210).
Corequisite: ECE 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.

ECE 512 Electronics II (3.0)
Prerequisites: Electronic Circuits (ECE 333) and Electronic Circuits Laboratory I (ECE 334).
Corequisite: ECE 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.

ECE 513 Electronics II Laboratory (1.0)
Prerequisite: Electronic Circuits Laboratory I (ECE 334).
Corequisite: ECE 512.
Laboratory requirement for ECE 512.

ECE 514 Introduction to VLSI Systems Laboratory (1.0)
Prerequisite: Logic Design & Lab (ECE 210 & 211).
Corequisite: ECE 510/CECS 510 & ECE 515, or consent of instructor.
Design of logic circuits and subsystems using CAD tools: layout, verification, parameter extraction, circuit- and logic-level simulation.

ECE 515 Introduction to VLSI Systems (3.0)
Prerequisite: Logic Design (ECE 210).
Corequisite: ECE 510/CECS 510 and ECE 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.

ECE 516 Microcomputer Design (4.0)
Prerequisite: Computer Interfacing (ECE/CECS 412) or consent of instructor.
Note: Cross-listed with CECS 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.

ECE 518 Fundamentals of Computer Communications and Networks (3.0)
Prerequisite: Probability and Statistics for Engineers (IE 360), and Computer Interfacing (ECE 412).
Note: Cross-listed with CECS 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.

ECE 520 Digital Signal Processing (3.0)
Prerequisite: Signals & Linear Systems (ECE 420) and Active Network Design I (ECE 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.

ECE 521 Digital Signal Processing Laboratory (1.0)
Prerequisite: Signals & Linear Systems (ECE 420) and Active Network Design I Laboratory (ECE 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.

ECE 530 Introduction to Random Processes and Estimation Theory (3.0)
Prerequisites: Linear Algebra for Engineering (CEE 330), Probability and Statistics for Engineers (IE 360), and Signals and Linear Systems (ECE 420).
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.

ECE 531 Electronic Circuit Design Laboratory (3.0)
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.

ECE 533 Integrated Circuit Design (3.0)
Prerequisite: Electronic Circuits (ECE 333) and Active Network Design (ECE 421).
Corequisite: ECE 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.

ECE 534 Integrated Circuit Design Laboratory (1.0)
Prerequisite: Electronic Circuits (ECE 333) and Active Network Design I (ECE 421).
Corequisite: ECE 533.
Laboratory to illustrate design principles in ECE 533.

ECE 535 Instrumentation Electronics (4.0)
Prerequisite: Major in mechanical engineering and Introduction to Electrical Engineering (ECE 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.

ECE 540 Lasers and Electrooptical Systems (3.0)
Prerequisite: Numerical Methods for Engineering (CEE 307), Linear Algebra for Engineering (CEE 330), and ECE 569; or faculty consent.
Corequisite: ECE 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.

ECE 541 Engineering Optics Laboratory (1.0)
Prerequisite: Numerical Methods for Engineering (CEE 307), Linear Algebra for Engineering (CEE 330), and ECE 569; or faculty consent.
Corequisite: ECE 540 or ECE 545.
Computer-aided design-oriented series of fundamental optics experiments ranging from thin lens experiments, diffraction, interference, laser coherence and birefringence. Abbe theory.

ECE 542 Physical Electronics (3.0)
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 capacitors, field effect transistors, microelectronic fabrication.

ECE 543 Fundamentals of Microfabrication and MEMS (3.0)
Prerequisites: Senior Standing.
Microfabrication techniques including cleanroom technology, lithography, thermal oxidation, diffusion, ion implantation, film deposition, etching, micromachining, wafer-level bonding/polishing, and packaging yield. Microtechnology measurement and analysis techniques. Process simulation. CAD device-layout. MEMS (microelectromechanical systems) and microelectric technology and applications. Material issues for MEMS/microelectronics.

ECE 544 Microfabrications/MEMS Laboratory (1.0)
Prerequisites/Co-requisite:
ECE 543.
Laboratory to illustrate microfabrication processes, semiconductor measurement techniques, MEMS microstructure fabrication, and MEMS testing. Cleanroom activity required.

ECE 545 Optical Signal Processing (3.0)
Prerequisite: Signals & Linear Systems (ECE 420); or consent of instructor.
Scalar diffraction theory and equivalence to linear filtering. Fourier transform properties of lenses. The modulation transfer function.

ECE 550 Communications and Modulation (3.0)
Prerequisite: Signals & Linear Systems (ECE 420).
Corequisite: ECE 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.

ECE 551 Communication Systems Laboratory (1.0)
Prerequisite: Signals & Linear Systems (ECE 420).
Corequisite: ECE 550.
Laboratory exercises involving the design and analysis of electronic communication systems for the transmission of analog and digital data at radio frequencies.

ECE 560 Control Systems Principles (3.0)
Prerequisite: Signals & Linear Systems (ECE 420).
Corequisite: ECE 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.

ECE 561 Control Systems Laboratory (1.0)
Corequisite: ECE 560.
Laboratory exercises involving identification, analysis and design of closed-loop control systems.

ECE 569 Intermediate Electromagnetic Fields and Waves (3.0)
Prerequisite: Introduction to Electromagnetic Fields and Waves (ECE 473).
General curvilinear coordinates. Electromagnetic energy transmission. The wave equation, Poynting theorem and plane wave propagation in media. Transmission lines and impedance matching.

ECE 570 Microwave Engineering (3.0)
Prerequisite or Corequisite:
ECE 569 and ECE 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.

ECE 571 Antennas (3.0)
Prerequisite or Corequisite: ECE 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.

ECE 572 Microwave Engineering Laboratory (1.0)
Prerequisite or Corequisite: ECE 569, ECE 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.

ECE 581 Electromechanics (3.0)
Prerequisite: Introduction to Electromagnetic Fields and Waves (ECE 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.

ECE 582 Power System Analysis (3.0)
Prerequisite: Introduction to Electromagnetic Fields and Waves (ECE 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.

ECE 593 Independent Study in Electrical Engineering (1.0-6.0)
Prerequisite: Approval of a faculty sponsor.

ECE 595 Graduate/Professional Seminar in Electrical & Computer Engineering (1.0)
The following courses of instruction offered by the Department of Electrical and Computer Engineering, Speed Scientific School, in conjunction with the Graduate School, are also available to students enrolled in the Professional School of Engineering-Division of Higher Studies, on approval.

ECE 600 Special Topics in Electrical & Computer Engineering (1.0-6.0)

ECE 605 Graduate Project in Electrical & Computer Engineering (1.0-6.0)
Prerequisite: Approval of a faculty sponsor.

ECE 611 Computer Architecture (3.0)
Prerequisite: ECE 510/CECS 510.
Note: Cross-listed with CSE/CECS 611.
Classification of computer designs. PMS and ISP descriptions. Study of major systems of current and historical interest.

ECE 614 Artificial Neural Systems (3.0)
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.

ECE 616 VLSI Architectures (3.0)
Prerequisites: ECE 510, 515 or consent of instructor
Design of datapaths and processor arrays, testability, analog architectures. VLSI design project: design, implementation and fabrication.

ECE 617 Expert Systems Engineering (3.0)
Knowledge representation, production and decision support systems. Electrical engineering design project using LISP, PROLOG or expert systems shell.

ECE 618 Digital Image Processing (3.0)
Prerequisite: ECE 520, 521 or ECE 420 and faculty consent.
Corequisite: ECE 635.
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.

ECE 619 Computer Vision (3.0)
Prerequisite: ECE 618.
Corequisite: ECE 645.
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 and 3D vision.

ECE 620 Pattern Recognition and Machine Intelligence (3.0)
Prerequisite: ECE 420, IE 360 or consent of instructor.
Corequisite: ECE 655.
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.

ECE 621 Active Network Design II (3.0)
Prerequisite: Active Network Design I (ECE 421).
Corequisite: ECE 622.
A continuation of ECE 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.

ECE 622 Active Network Design II Laboratory (1.0)
Prerequisite: Active Network Design I Laboratory (ECE 422).
Corequisite: ECE 621.
Laboratory to illustrate analysis and design principles.

ECE 625 State Space Theory of Linear Systems (3.0)
Prerequisite: Signals & Linear Systems (ECE 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.

ECE 630 Pulse and Digital Waveforms (3.0)
Prerequisite: Active Network Design I (ECE 421), or consent of instructor.
Corequisite: ECE 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.

ECE 631 Pulse and Digital Laboratory (1.0)
Prerequisite: Active Network Design I Lab (ECE 422) or consent of instructor.
Corequisite: ECE 630.
Laboratory to illustrate analysis and design principles.

ECE 635 Digital Image Processing Laboratory (1.0)
Corequisites: ECE 618.
Laboratory experiments in hardware and software forms are assigned to test the concepts covered in ECE 618, Digital Image Procesing. Projects include: digital image acquisition, transform analysis of digital images, image enhancement for display and printing, color image processing and image quality, image coding and compression, video processing, high definition television, networking and broadcasting, and image reconstruction from projects.

ECE 640 Introduction to Biomedical Engineering (3.0)
Prerequisite: Signals & Linear Systems (ECE 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.

ECE 642 Fiber Optics and Integrated Optical Systems (3.0)
Prerequisite: Numerical Methods for Engineering (CEE 307), Linear Algebra for Engineering (CEE 330), and ECE 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.

ECE 645 Computer Vision Laboratory (1.0)
Prerequisites: ECE 618.
Corequisites: ECE 619.
Laboratory experiments in hardware and software forms are assigned to test the concepts covered in ECE 619, Computer Vision. Projects include: Image formation and camera calibration, stereo vision, 3D object reconstruction from the sequence of images,active vision applications, surface registration, and motion estimation.

ECE 646 Optical Computer Architectures (3.0)
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.

ECE 647 Fundamentals of Optoelectronics and Photonics (3.0)
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.

ECE 650 Statistical Theory of Communication (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 360) and ECE 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.

ECE 651 Communication System Design (3.0)
Prerequisite: ECE 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.

ECE 652 Information Theory and Coding (3.0)
Prerequisite: ECE 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.

ECE 655 Pattern Recognition and Machine Intelligence Laboratory (1.0)
Corequisite: ECE 620.
Laboratory experiments in hardware and software forms are assigned to test concepts covered in ECE 620, Pattern Recognition and Machine Intelligence. Projects include: Stochastic simulation, design of Bayesian classifiers, clustering, hyperspectral classifiers, digital train mapping, automatic target recognition, and biomedical applications.

ECE 661 Sampled-Data Control Systems (3.0)
Prerequisite: ECE 560.
Analysis and synthesis of closed-loop sampled-data control systems using Z-transforms and state-space methods. Sampling and data reconstruction. Modified Z-transform. Time response and steady state accuracy. Stability analysis. Lag, lead, and PID controllers. Pole assignment. State estimation. Discrete optimal control.

ECE 662 Introduction to Optimum Control (3.0)
Prerequisite: ECE 560.
Calculus of variations, dynamic programming, the minimum principle, and numerical optimization techniques applied to discrete-time and continuous-time deterministic control systems.

ECE 664 Modern Adaptive Control (3.0)
Prerequisite: ECE 560 and 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.

ECE 665 Theory of Nonlinear Systems (3.0)
Prerequisite: ECE 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.

ECE 667 Fuzzy Control (3.0)
Prerequisites: ECE 560 and ECE 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.

ECE 670 Advanced Electromagnetic Theory (3.0)
Prerequisite: ECE 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.

ECE 681 Solid-State Motor Controls (3.0)
Prerequisite or corequisite: ECE 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.

ECE 682 Advanced Power System Analysis (3.0)
Prerequisite: ECE 582.
Symmetrical components. Unsymmetrical faults. Power system stability. Power system protection. Computer methods.

ECE 690 M.S. Thesis in Electrical Engineering (1.0-6.0)
Experimental and/or theoretical research to be presented in thesis for degree requirement.

ECE 693 Independent Study in Electrical & Computer Engineering (1.0-6.0)
Prerequisite: Approval of a faculty sponsor.

ECE 695 Graduate Seminar in Electrical and Computer Engineering (1.0)

ECE 697 Master of Engineering Thesis in Electrical Engineering (1.0-8.0)
Prerequisite: ECE 496 and Graduate/Professional standing.
A candidate for the Master of Engineering degree may satisfy this requirement by producing a written thesis to be presented and defended orally before a faculty committee for approval.

ECE 698 Master of Engineering Paper in Electrical Engineering (1.0-8.0)
Prerequisites: ECE 496 and Graduate/Professional standing.
A candidate for the Master of Engineering degree may satisfy this requirement by producing a written technical paper to be presented and defended orally before a faculty committee for approval. The paper must also be submitted to a refereed conference or refereed journal for potential publication.

ECE 700 Dissertation Research in Electrical Engineering (1.0-18.0)
Prerequisites: Completion of doctoral core program and consent of dissertation director.
Original research activity in an appropriate electrical engineering discipline, under the direction of an Electrical and Computer Engineering graduate faculty member.

Economics

ECON 500 Foundations of Economics (3.0)
Prerequisites: Consent of instructor.
Note: Crosslisted with PLAN 500.
Survey of supply and demand analysis, cost and production, and price determination in different market organizations. Analysis of GOP, unemployment, inflation, and economic growth.

ECON 600 Managerial Economics (3.0)
Prerequisites: Econ 500.
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, international competitiveness, and economic analysis of current business trends and changing technologies are among the topics covered.

ECON 605 Urban Economics (3.0)
Prerequisites: PLAN 500, ECON 500, or consent of instructor.
Note: Crosslisted with PADM 640, UPA 603, and PLAN 603.
Application of economic theory to urban policy issues including metropolitan development and job creation, poverty, crime, transportation, environment, spatial structure, and other issues.

ECON 620 Economic Conditions and Forecasting (3.0)
Prerequisites: ECON 600 or ECON 605/UPA 603/PLAN 603/PADM 640.
Note: Crosslisted with PLAN 628 and UPA 624.
Develops quantitative tools for the analysis and forecasting of economic phenomena. Both structural and time series models are presented. Basic econometric methods are used to fit models and evaluate their forecasting properties.

ECON 640 Public Finance (3.0)
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 (3.0)
Examines health care issues by applying microeconomic theory. Particular emphasis on health insurance, managed care, health care production, and physician services.

ECON 650 Macroeconomic Theory (3.0)
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 (3.0)
Prerequisites: ECON 500/PLAN 500.
Note: Crosslisted with UPA 628.
A thorough examination of the theory of household and firm. Determination of price under different market structures.

ECON 670 International Economy (3.0)
A Discussion of current problems of international trade and finance and their effects upon the national economy and the firm. Particular stress is placed upon the role of private capital in the developed and the developing economies.

ECON 680 Special Topics in Economics (1.0-6.0)
An advanced study of one or more selected topics or issues related to the study of Economics.

ECON 698 Research Seminar in Economics (1.0-3.0)
Prerequisite: One 600-level economics course and permission of the departmental chair.

Educational and Counseling Psychology

ECPY 501 Independent Study in Educational Psychology (1.0-3.0)
To be arranged with the dean.

ECPY 502 Independent Study in Educational Psychology (1.0-3.0)
Refer to: ECPY 501

ECPY 507 Learning Theory and Human Growth and Development (3.0)
Basic principles of learning theory and human development. Included are the major theories of learning including behaviorism, cognitive, and cultural historical activity theory along with physical, social, cognitive, emotional, language, and cultural development as they apply to children and youth including those with special needs.

ECPY 512 Learning and Cognition in Education (3.0)
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 (3.0)
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 Topical Studies in Educational Psychology I (1.0-3.0)
Prerequisite: Consent of instructor.
Investigation of current concerns and issues in educational psychology.

ECPY 526 Topical Studies in Educational Psychology II (1.0-3.0)
Refer to: ECPY 525

ECPY 527 Workshop in Educational Psychology I (1.0-4.0)
Prerequisite: Consent of instructor.
Topical workshop on educational psychology concerns.

ECPY 528 Workshop in Educational Psychology II (1.0-4.0)
Refer to: ECPY 527

ECPY 540 Evaluation and Measurement in Education (3.0)
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 Seminar in Guidance (1.0-4.0)
Prerequisite: Majors are urged to take seminars prior to or concurrent with practicum.
The investigation of special problems in counseling.

ECPY 597 Seminar in Guidance (1.0-4.0)
Refer to: ECPY 596

ECPY 600 Introduction to Counseling and Psychotherapy (3.0)
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 (3.0)
Survey of the principles of development from conception to adulthood, emphasizing biological, environmental, and cultural factors affecting development.

ECPY 607 Learning Theory and Human Growth and Development (3.0)
Basic principles of learning theory and human development. Included are the major theories of learning including behaviorism, cognitive, and cultural historical activity theory along with physical, social, cognitive, emotional, language, and cultural development as the apply to children and youth including those with special needs.

ECPY 611 Learning Systems: Theory and Practice (3.0)
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 (3.0)
The study of major theoretical positions in counseling and psychotherapy; implications for research and practice.

ECPY 620 Classroom Based Guidance/Counseling (3.0)
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 (3.0)
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 (3.0)
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.

ECPY 625 Elementary School Counseling (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisites: 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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: ECPY 570/670.
Advanced study of current research and theories of career counseling and career-related assessment.

ECPY 680 Practicum in Counseling (1.0-8.0)
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 (3.0)
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 (1.0-3.0)
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.

ECPY 684 Internship in School Counseling (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Covers current issues in counseling and psychology. Course may be repeated.

ECPY 695 Capstone Seminar in College Personnel Work (3.0)
Prerequisite: 30 hours in master's program.
Examines various topical areas in the field of student affairs in today's university setting. Emphasis on synthesis of topical material covered in other courses in the curriculum. Primary focus will be the integration of the practical application in conjunct with developmental theory models.

ECPY 696 Independent Study in Guidance (1.0-3.0)
By arrangement with dean and advisor.

ECPY 697 Topical Seminar in College Student Personnel Services (3.0)
Selected topics such as legal problems, housing, and financial aid, determined by student needs and interests.

ECPY 698 Supervised Readings (1.0-3.0)
By arrangement with advisor and dean.

ECPY 699 Thesis or Professional Paper (3.0-6.0)
Prerequisite: EDFD 600 or equivalent; consent of advisor and dean.

ECPY 700 Supervised Research in Counseling Psychology (1.0-6.0)
Prerequisites: Admission to doctoral program in counseling psychology.
An intensive research apprenticeship with a faculty member. Students assist in formulating research hypotheses, articulating the research design, developing the research method, making arrangements to conduct the study, entering and analyzing the data, and writing up the findings for publication.

ECPY 705 Adult Development Theories (3.0)
Prerequisite: Consent of instructor.
A seminar examining physical, psychological, and social changes that occur during adulthood and how those changes affect learning.

ECPY 710 Social Ecology & Social Behavior (3.0)
Prerequisites: Doctoral students status or permission of instructor.
The development of culture and the effects of social systems on individual & group behavior including the development and interaction of social systems with individual psychology, biological constraints on social behavior, and the effects of the interaction of different social systems.

ECPY 721 Advanced Counseling Seminar (1.0-8.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Methodologies of developing student affairs programs. Needs assessment through summative evaluations.

ECPY 762 Training of College Student Personnel Paraprofessionals (3.0)
Prerequisite: ECPY 629, ECPY 650, EDAD 682.
Basic training program for paraprofessionals who work in such traditional settings as residence halls, tutorials, peer advisors and 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 (3.0)
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 (3.0)
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 (1.0-9.0)
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 (1.0-9.0)
Prerequisite: Admission to post-masters programs.
Field observation or experience.

ECPY 782 Doctoral Internship (3.0-6.0)
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 Doctoral Seminar in Counseling and Student Personnel (3.0)
Prerequisite: Doctoral students in counseling and student personnel or consent of instructor.
Analysis of current issues and research in the field of counseling.

ECPY 794 Doctoral Seminar in Counseling and Student Personnel (3.0)
Refer to: ECPY 793

ECPY 795 Doctoral Research (1.0-15.0)
Prerequisites: Completion of coursework for Ed.D program or successful completion of comprehensive examinations.
Note: Crosslisted with EDSP, EDAD, EDSD, EDEM, EDFD, EDTD 795. Doctoral students must register for the course by using the departmental prefix, corresponding to their dissertation chair.

ECPY 796 Research Literature (1.0-6.0)
For advanced graduate students only. Consent of instructor and department chair required.

ECPY 798 Field Study (2.0)
For Ed.S. candidates only.

ECPY 799 Professional Paper (1.0-5.0)
For Ed.S. candidates only.
To provide course credit for the Ed.S. candidate in completing the required independent professional project.

Administration and Higher Education

EDAD 504 School Law for Teachers (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Examines concepts, analytical tools, case material, and organizational theories from the public, business, and educational administration sectors.

EDAD 608 K-12 Leadership (3.0)
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 (3.0)
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 (3.0)
A lecture-laboratory course to build student awareness and skills for effective collaborative leadership, communication, decision-making, community relations, and group management.

EDAD 612 Human Resource Management (3.0)
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 (3.0)
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 (3.0)
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 (1.0-6.0)
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 (3.0)
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 (3.0)
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 (3.0)
Focuses on the development of planning, implementation, and leadership skills needed to direct strategic decision-making.

EDAD 679 The Superintendency Practicum (2.0-6.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-6.0)
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 (2.0-6.0)
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 (1.0-3.0)
By arrangement with advisor and consent of dean.

EDAD 698 Supervised Readings (1.0-3.0)
By arrangement with advisor and consent of dean.

EDAD 699 Thesis or Professional Paper (1.0-6.0)
Culminating paper for masters degree in higher education. By arrangement with advisor.

EDAD 700 Doctoral Seminar in Educational Administration (3.0)
Study of meaning and requirements of doctoral study. Discussion of current literature. Pass/Fail.

EDAD 701 Advanced Organizational Theory (3.0)
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 (2.0-6.0)
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 (3.0)
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 (1.0)
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 (3.0)
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 (3.0)
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 (1.0-15.0)
Prerequisite: Completion of coursework for Ed.D program or successful completion of comprehensive examinations.
Note: Crosslisted with EDSP, ECPY, EDSD, EDEM, EDFD, EDTD 795. Doctoral students must register for the course by using the departmental prefix corresponding to their dissertation chair.

EDAD 796 Research Literature (1.0-6.0)
For Ed.S. candidates only. Culminating paper for specialist in education degree. By arrangement with advisor.

Early and Middle Childhood Education

EDEM 501 Independent Study in Early and Middle Childhood Education (1.0-3.0)
To be arranged with the dean.

EDEM 502 Independent Study in Early and Middle Childhood Education (1.0-3.0)
Refer to: EDEM 501

EDEM 503 Building Classroom Community (3.0)
Prerequisites: EDEM 503, EDEM 509, & EDUC 503 must be taken concurrently.
Explore issues of creating a caring community of learning in early elementary school classrooms. Provides the students with an understanding of how issues of ethnical and social development in children are integrally interwoven into the academic/cognitive learning that we typically envision in classrooms.

EDEM 506 Study of Multiethnic Education (3.0)
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 (1.0)
Linking seminar with other academic specialty area courses and Core I.

EDEM 508 Child and Family Studies Seminar II (1.0)
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 (1.0)
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 510 SP Topics in Math Ed (3.0)
SP Topics n Math Ed.

EDEM 511 Reading and Writing in Content Areas (3.0)
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 (1.0)
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 (4.0-6.0)
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 (1.0-4.0)
An analysis of issues and problems in early childhood education.

EDEM 540 Teaching Adolescent Readers (3.0)
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 Student Teaching in Grades 5-8 (4.0)
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 553 Student Teaching in Grades 5-8 (4.0)
Refer to: EDEM 552

EDEM 581 Teaching for Talent Development (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Note: Cross-listed with EDSD 592 and PAS 531.
An intensive survey of the history and culture of African-Americans for teachers.

EDEM 596 Seminar in Elementary Education (1.0-4.0)
The investigation of special problems in education.

EDEM 597 Seminar in Elementary Education (1.0-4.0)
Refer to: EDEM 596

EDEM 602 Elementary School Curriculum (3.0)
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 (3.0)
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 (1.0-6.0)
Intensive study in a current problem in an area of curriculum development or curriculum construction.

EDEM 605 Action Research for Classroom Teachers (3.0)
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 (3.0)
A basic study of philosophy, organizational patterns, and curriculum concepts relating to teaching in the middle grades.

EDEM 608 Integrated Thematic Units (3.0)
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 (3.0)
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 (3.0)
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 614 Supporting Struggling Readers and Writers K-12 (3.0)
Prerequisites: One basic course on the teaching of reading and writing. Addresses the needs of teachers who work with students who have not learned to be fluent, eager and effective readers and writers. Focuses development of literacy concepts that define, support, keep flexible literacy skills.

EDEM 615 Measurement and Evaluation in Literacy (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 627 Applied Child Development (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 and Methods in Early Childhood Education (3.0)
Prerequisites: 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 (3.0)
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 (3.0)
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 (3.0)
Responsibilities of the day care or early childhood program director and the early childhood consultant.

EDEM 636 Theories of Play (3.0)
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 637 Infant/Toddler Development & Care (3.0)
Focuses on the young child (birth-four years of age). Includes an overview of development, child care, curriculum and facility design, assessment of young children, and planning developmentally appropriate experiences.

EDEM 638 Advanced Practicum in Early Childhood Education (4.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-6.0)
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 (3.0)
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 (3.0)
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 (3.0)
Examines learning in informal education sites and develops appropriate instructional programs.

EDEM 656 Science Education for Middle Schools (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Examines alternative approaches to assessing instruction and learning in science classrooms.

EDEM 662 Workshop in Social Studies Education (3.0)
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 (3.0)
Provides an introduction to observational methods of studying animal behavior and the scientific methods.

EDEM 664 Trends in Social Studies Education (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Note: Cross-listed with EDSD 669.
Examines economic content, materials and strategies. Economic education teaching units are developed, taught and evaluated.

EDEM 671 Introduction to Children's Literature and Literacy Instruction (3.0)
Prerequisites: Acceptance into P-5 MAT program.
Literacy instructional strategies, based on literature, are explored and demonstrated. The connection between children's literature and reading instruction is investigated.

EDEM 672 Elementary: Orientation and General Methods (3.0)
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 (9.0)
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 (3.0)
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 (3.0-6.0)
Prerequisites: Admission to the MAT ad 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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Current topics in the education of the gifted. Course topics will vary as needed.

EDEM 686 Learning Styles: Curriculum & Instruction (3.0)
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 (3.0)
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 (9.0)
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 (3.0)
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.

EDEM 692 Middle Grades: Case Studies (3.0)
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 (3.0)
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 (1.0-6.0)
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 (1.0-5.0)
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 (1.0-3.0)
By arrangement with dean and advisor.

EDEM 698 Supervised Readings (1.0-2.0)
By arrangement with dean and advisor.

EDEM 699 Thesis or Professional Paper (2.0-5.0)
Prerequisite: EDFD 600 or equivalent; consent of dean and advisor.

EDEM 710 Advanced Study in Literacy (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 770 Doctoral Seminar in Supervision (3.0)
Prerequisites: Near the end of the doctoral program and by permission of instructor (for students in supervision subspeciality).
Note: Crosslisted with EDSD 770.
Provides an information base in the field of interest, opportunities to explore recent innovations in Supervision, and practice in evaluating slected supervision strategies.

EDEM 796 Research Literature (1.0-6.0)
For Ed.S. candidates only.

EDEM 798 Field Study (2.0)
For Ed.S. candidates only.

EDEM 799 Professional Paper (1.0-5.0)
For Ed.S. candidates only.

Foundations of Education

EDFD 596 Seminar in Foundations of Education (1.0-4.0)
Prerequisite: Consent of the dean.
The investigation of special problems in education.

EDFD 597 Seminar in Foundations of Education (1.0-4.0)
Refer to: EDFD 596

EDFD 600 Introduction to Research Methods and Statistics (3.0)
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 (3.0)
Prerequisites: 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 (3.0)
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 (1.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 Motivation and Human Resource Development (3.0)
The course examines social factors that influence adult motivation and performance in human resource 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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
By arrangement with dean and advisor.

EDFD 699 Thesis or Professional Paper (2.0-5.0)
Prerequisite: EDFD 600; consent of advisor and dean. For M.A. and M.Ed. only.

EDFD 700 Research Concepts and Design (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0-6.0)
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 (3.0)
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 (1.0-15.0)
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 (1.0-6.0)
Prerequisite: Consent of instructor.
For post-masters students candidates only.

EDFD 799 Professional Paper (1.0-5.0)
For Ed.S. candidates only.

Secondary Education

EDSD 506 Exploring Teaching (6.0)
Prerequisites: Must meet the Writing Proficiency Process established by the College of Education and Human Development.
This course focuses on human development and learning; sociological, political and cultural influences; educational theories, and curriculum and instruction issues. Twenty hours of classroom fieldwork and twenty hours of community service fieldwork required.

EDSD 511 Reading and Writing in Content Areas (3.0)
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 535 Student Teaching in the Secondary School (4.0)
Prerequisites: EDSD/EDEM 201, ECPY 305, EDSD 401/601, EDSD 575, and admission 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 533. EDSD 556 may be taken previously or concurrently.

EDSD 540 Teaching Adolescent Readers (3.0)
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 575 Instructional Media (3.0)
Demonstration and utilization of instructional media (hardware and software), including films, film strips, slides, transparencies, audio and video recordings, and computers.

EDSD 590 Teacher Institute on African-American Issues (3.0)
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 (3.0)
Note: Cross-listed with EDEM 591 and PAS 530.
An intensive survey of the history and culture of Africa (to 1600) for teachers.

EDSD 592 Survey of African-American History and Culture for Teachers (3.0)
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 (1.0-4.0)
The investigation of special problems in education.

EDSD 601 Materials and Methods in Secondary Education (3.0)
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 (3.0)
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 (6.0)
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 (3.0)
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 (4.0)
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 (4.0)
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 (3.0)
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 (1.0)
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 (3.0)
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 (6.0)
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 (3.0)
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 (3.0)
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 620 Art Student Teaching in the Elementary/Secondary Schools I (4.0)
Prerequisites: EDEM 514, EDEM 515 and either EDEM 516 or EDEM 517 or EDUC 505 or EDUC 506; EDSD 605, EDSD 606 (or currently enrolled in EDSD 606), EDUC 620 or a 2.75 g.p.a. in major and minor teaching fields, admission to teacher education program, admission to the MAT program.
Corequisites: EDSD 609 and EDSD 610.
Provides supervised observation, participation and teaching.

EDSD 621 Art Student Teaching in the Elementary/Secondary Shools II (4.0)
Prerequisites: EDEM 514, EDEM 515 and either EDEM 516 or EDEM 517 or EDUC 506; EDSD 605, EDSD 606 (or currently enrolled in EDSD 606) EDUC 620, a 2.75 g.p.a. in major and minor teaching fields, admission to teacher education program, and admission to the MAT program.
Corequisites: EDSD 609 and EDSD 610.
Provides supervised observation, participation and teaching.

EDSD 627 Teaching Structured Computer Programming (3.0)
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 (3.0)
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 (4.0)
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 Student Teaching in the Secondary School (4.0)
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 (3.0)
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 636 Student Teaching in the Secondary School (4.0)
Refer to: EDSD 634

EDSD 642 Secondary Instruction (3.0)
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 (1.0-6.0)
Intensive study of a current problem in an area of curriculum development or curriculum construction.

EDSD 646 Literature in the Secondary Language Arts Curriculum (3.0)
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.

EDSD 647 Teaching Writing and Language in the Secondary School (3.0)
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 (3.0)
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 (1.0-6.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Analysis and use of techniques of televised presentation in development of prototype instructional programs.

EDSD 696 Independent Study in Secondary Education (1.0-3.0)
By arrangement with dean and advisor.

EDSD 698 Supervised Readings in Educational Literature (1.0-3.0)
By arrangement with dean and advisor.

EDSD 699 Thesis or Professional Paper (2.0-5.0)
Prerequisite: EDFD 600 or equivalent; consent of dean and advisor.

EDSD 730 Internship in Teaching and Learning (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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.

Special Education

EDSP 528 Assessment Procedures for the Visually Impaired (3.0)
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 (4.0)
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 (3.0)
Study of language development from infancy through adolescence. Relates language to adaptive and personal-social growth.

EDSP 537 Language Learning for Exceptional Children (3.0)
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 (3.0)
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 (3.0)
An integration of theoretical, conceptual, and applied educational systems for children with learning and behavior disorders.

EDSP 545 Exceptional Children in the Regular Classroom (3.0)
Prerequisite: EDSP 540.
Educational programming for exceptional children in regular classrooms; curricular approaches in mainstreaming.

EDSP 578 Practicum in Teaching the Trainable Mentally Retarded (4.0)
Prerequisite: EDSP 540, 570 and 586.
Supervised student teaching of trainable mentally retarded children.

EDSP 586 Diagnostic and Prescriptive Teaching of Moderately Retarded Individuals (3.0)
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 (3.0)
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 Seminar in Special Education (1.0-4.0)
The investigation of special problems in education.

EDSP 597 Seminar in Special Education (1.0-4.0)
Refer to: EDSP 596

EDSP 600 Assessment of Students with Disabilities (3.0)
Prerequisites: EDSP 540 or Survey course in special education.
Examines and discusses the identification of assessment instruments used in the evaluation process of children and youth with moderate, severe, and profound disabilities.

EDSP 610 Administration and Supervision in Special Education (3.0)
The development, coordination, administration, and supervision of special services for exceptional children.

EDSP 612 Curriculum Methods and Assessment I (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 620 Introduction to Orientation and Mobility (4.0)
Prerequisites: EDSP 624, EDSP 625.
An in-depth study of the history, development and future trends in the field of orientation and mobility. Current practices and philosophies will be discussed. This course will also include an extensive review of the visual system and common eye conditions and disorders as they relate to orientation and mobility (O&M) intervention. A one credit hour lab will be mandatory for all students who have not completed a basic O&M course or who wish to review these prerequisite skills.

EDSP 621 Advanced Methods in Orientation and Mobility 1 (3.0)
Prerequisites: EDSP 624, EDSP 625, EDSP 540, EDSP 620, EDSP 623.
Prepares the future orientation and mobility (O&M) specialist in methods, techniques, and procedures in the area of pre-cane and cane travel skills essential in the development of independent travel skills for persons with visual impairments.

EDSP 622 Advanced Methods in Orientation and Mobility II (3.0)
Prerequisites: EDSP 620, EDSP 621, EDSP 623, EDSP 624, EDSP 625, EDSP 540, consent of instructor.
Provides application of skills learned in EDSP 621 and to real world situations, conditions, and environments typical of those in which persons who are blind must live, work, and travel.

EDSP 623 Foundations in O&M for Infants, Preschool and Multiply Impaired (3.0)
Prerequisites: EDSP 624, EDSP 540, EDSP 625, consent of instructor.
Methods of teaching orientation and mobility skills to visually impaired and blind children, and individuals who are multiply impaired with an emphasis on infants, preschool and multiply impaired students, with particular attention to concept development, gross and fine-motor skills, early intervention, parent training, orientation skills, pre-cane skills, cane skills, protective techniques, exploration and independent ambulation.

EDSP 624 Educational, Physical, Psychological and Social Aspects of Visual Impairment and Blindness (3.0)
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 (3.0)
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 (3.0)
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 Applications of Assistive Technology (3.0)
Prerequisites: EDSP 540 or Survey course in special education.
Designed to provide professionals information about the latest advances in assistive technology for students with learning, visual, hearing and multiple disabilities. Provided on the web. CyberLessons are provided as well as CD supplemental materials, demonstrations, and required readings will be combined to provide a basic foundation of skills.

EDSP 628 Seminar: Assessment of the Visually Impaired Students (3.0)
Discussion of special topics of educating visually impaired persons.

EDSP 629 Student Teaching with Visually Impaired Students (3.0)
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 630 Practicum: Observation and Participation in Orientation and Mobility (3.0)
Prerequisites: EDSP 620, EDSP 621,EDSP 623, EDSP 624, EDSP 625, EDSP 540, consent of instructor.
Practicum experience in direct instruction of students who are visually impaired under the direct and constant supervision and mentoring of a certified O&M specialist. A weekly seminar will be conducted to discuss observations, experiences, and issues.

EDSP 631 Internship in Orientation and Mobility (3.0)
Prerequisites: EDSP 620, EDSP 621, EDSP 622, EDSP 623, EDSP 624, EDSP 625, EDSP 630, and EDSP 540, consent of instructor.
Completes the 360-clock hour requirement for successful practicum and student teaching experience for an O&M specialist. Meets and exceeds all national certification requirements of the Academy of the National Federation of the Blind (NFB).

EDSP 633 Curriculum and Methods for Early Childhood Special Education (3.0)
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 Characteristics & Needs of Students with Moderate and Severe Disabilities (3.0)
This course addresses the issues and trends of teaching persons who are diagnosed with moderate and severe disabilities. Focus is on the instructional, social, educational, and transitional needs.

EDSP 635 Moderate and Severe Disabilities Practicum (3.0)
Prerequisites: Undertaken after all program requirements have been meet.
Practicum: A field -based developing-teacher experience that provides active classroom involvement with students diagnosed with moderate, severe , or multiple disabilities while under the supervision of trained educators and University faculty.

EDSP 636 Diagnostic/Prescriptive Teaching of Individuals with Moderate Mental Retardation (3.0)
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 Transdisciplinary Collaboration for Inclusion (3.0)
Prerequisites: EDSP 540 or Survey course in special education.
Designed for teaching children with disabilities in the inclusive general education classroom. The course provides strategies for curriculum development, instructional modifications and student accomodations focusing on teachers working as members of a team within the framework of general curricula and classrooms. This is a distance education course.

EDSP 638 Educational Management of Health, Physical and Multiple Disabilities (3.0)
Prerequisites: EDSP 540 or Survey course in special education and EDSP 634 Characteristics & Needs of Students with Moderate and Severe Disabilities.
Addresses a broad range of issues of importance to the health and physical problems of students with multiple disabilities.

EDSP 639 Research Analysis in Special Education (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (4.0)
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.

EDSP 648 Psychological Assessment I (3.0)
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 (3.0)
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 Disorder (12.0)
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 Disorder (9.0)
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 & Behavior Disorders (9.0)
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 660 Assistive Technology: Introduction and Software Applications for Young Children (3.0)
Provide educators with the awareness ofthe range of available Assistive Technology (AT) options and knowledge of softwareto enhance learning experiences for students with disabilities. Participants will investigate the use of Assistive Technology as it relates to life skills such as communication, mobility, education, recreation, vocation, independence, and therapy/rehabilitation.

EDSP 661 Assistive Technology: Assessment Data Collection and Decision-Making (3.0)
Prerequisites: EDSP 660 Assistive Technology Introduction and Software for Young Children.
Participants in this course gain an understanding of the importance of the assessment process in determining appropriate assistive technology solutions. Legal issues associated with assessment, theories that drive data gathering, data gathering instruments and procedures, administrative responsibilites, team assessments, and care-giver involvement are a few of the topics addressed.

EDSP 662 Assistive Technology: Funding and Family Involvement (3.0)
Prerequisites: EDSP 660 Assistive Technology: Introduction and Software for Young Children.
This course emphasizes the need for family participation in the selection, acquisition and implementation of assistive technology. The variety of funding sources and other related alternatives available to assist consumers in purchasing assistive technology services, software, and devices are also explored.

EDSP 664 Assistive Technology: Computer Access and Switches and Toys (3.0)
Prerequisites: EDSP 660 Assistive Technology: Introduction and Software Applications for Young Children.
This course addresses a variety of computer access methods including speech synthesis, touchscreens, expanded keyboards and other interface alternatives as well as the construction and repair of switches, toys and other such devices that play important roles in the daily lives of individuals with disabilities.

EDSP 670 Autism: Introduction and Understanding (3.0)
Increase understanding of individuals with Autism/Pervasive Developmental Disorder (PDD) across the lifespan. Characteristics of this population, namely communication, social and behavioral attributes will be examined as they are manifested across all ages in the context of the family and community. Historical, diagnostic, and identification issues will be addressed.

EDSP 671 Autism: Strategies and Techniques (3.0)
Prerequisites: Intro to Autism or permission of instructor.
Students will examine instructional approaches used with students with autism. Particular emphasis on research based strategies that have considerable utility in facilitating increases in communication, social skills, and involvement in-group activites.

EDSP 672 Autism: Collaboration and Technology (3.0)
Prerequisites: EDSP 671.
Prepare students to develop augumentative/alternative communication systems for individuals with autism. Students will create technology based communication systems with an emphasis on Board/Maker and Overlay Maker. Follow up sessions will be devoted to discussing strategies of implementation.

EDSP 673 Educational Procedures for Exceptional Children: Diagnostic and Prescriptive Education (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0-4.0)
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 (3.0)
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 (3.0)
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 (3.0)
Identification and assessment of children with special needs, ages birth to five.

EDSP 684 Early Family Intervention for Preschool Disabilities (3.0)
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 (3.0)
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 (6.0)
Preparation of teachers in the development, implementation and evaluation of preschool programs for children with disabilities.

EDSP 690 Human Sexuality of the Developmentally Disabled (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
By arrangement with advisor.

EDSP 697 Topical Seminar (1.0-4.0)
Intensive study of topics indicated.

EDSP 698 Supervised Readings (1.0-3.0)
By arrangement with advisor.

EDSP 699 Thesis or Professional Paper (2.0-5.0)
Prerequisite: Consent of advisor.

EDSP 710 Professional Seminar in Special Education (3.0)
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 (3.0-6.0)
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 (3.0)
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 (1.0-15.0)
Prerequisite: Passing Ed.D. Comprehensive Examination and admission to candidacy for the Doctoral Degree.
Note: Cross-listed with EDAD, EDFD, ECPY, EDUC 795.

EDSP 796 Research Literature in Special Education (1.0-6.0)
For Ed.S. and Ed.D. candidates only.

EDSP 798 Internship/Field Experience in Special Education (3.0)
For Ed.D. candidates only.

EDSP 799 Professional Paper (1.0-6.0)
For Ed.S. and Ed.D. candidates only.

Occupational Training and Development

EDTD 501 Independent Study in Occupational Training and Development (1.0-3.0)
Provides Training & Development students with course credit for special investigation into areas not currently subsumed in existing courses.

EDTD 502 Independent Study in Occupational Training and Development (1.0-3.0)
Refer to: EDTD 501

EDTD 515 Supervised Staff-Industry Exchange (1.0-3.0)
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 520 Seminar Special Topics (1.0-5.0)
Seminar course on selected topics relevant to current issues and concerns in occupational education.

EDTD 530 Occupational Education Instructional Internship (2.0-8.0)
Instructional experience in public occupational education programs at the secondary and/or postsecondary level.

EDTD 540 Practicum in Occupational Subjects (2.0-8.0)
Prerequisite: For experienced teachers.
Practicum in occupational education agencies. Experiences in secondary and postsecondary programs; research, administration, instruction, coordination, and development.

EDTD 574 Using Productivity Tools (3.0)
Teaches the basic operation of computer systems and use of integrated word processing, spreadsheet, database and presentation software for purpose of application to instruction and/or training, and to professional/classroom/school management. Required for all Occupational Training BS programs and for M.Ed. Technology Strand.

EDTD 596 Seminar in Training and Development (1.0-4.0)
The investigation of special problems in training and development.

EDTD 597 Seminar in Training and Development (1.0-4.0)
Refer to: EDTD 596

EDTD 604 Planning & Evaluation (3.0)
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 611 Performance Improvement in Human Resource Development (3.0)
Systematic approach to developing human resources in a work environment with emphasis on individual, process and organizational level performance improvement and integration of performance improvement techniques in human resource development.

EDTD 615 Human Resource Development Internship (2.0-8.0)
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 616 Capstone Seminar & Portfolio Presentation (3.0)
1 lecture, 2 field work.
Prerequisites: Graduate standing, completion of all courses required for student's program, and approval from the student's advisor.
Covers three components: development of a professional portfolio, a supervised professional work experience in activities related to the student's masters program and professional goals, and a presentation of the student's portfolio with reflection upon growth in the program to an authentic audience.

EDTD 630 Occupational Education for Youth and Adults with Special Needs (3.0)
Emphasis on integrating instructional and/or management activities to assist disadvantaged and handicapped persons enrolled in occupational education programs.

EDTD 640 Graduate Seminar (1.0-4.0)
Detailed discussion of new and emerging themes in human resource development and/or instructional technology.
This course may be used as an elective in the Med in HRD, Med in Instructional Technology, and the MED in Occupational Education.

EDTD 661 Adult Development and Learning Principles (3.0)
Study of current cognitive, psychomotor and affective theories and their application to training programs in industry.
Required for the M.Ed. in Occupational Education.

EDTD 662 Oraganizational Analysis (3.0)
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 (3.0)
Development of the presentation skills needed to conduct training programs in non-school settings. Focus placed upon the difference between teaching and facilitation of adult learning. This course is required for the Master of Education in Occupational Training and Development.

EDTD 664 Facilitating Change in Organizations (3.0)
Consists of the study of the organization as a system and how organizations change and develop in reaction to internal and external forces.

EDTD 672 Industrial Design and Development (3.0)
Emphasizes 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 673 Curriculum Leadership for Technology Integration (3.0)
Facilitate the integration of technology skills and concepts by evaluating and planning curriculum designs, by identifying and evaluating software and by developing and practicing methods for technology use.

EDTD 674 School Technology Leadership Seminar (3.0)

EDTD 675 Applications of Instructional Technology (3.0)
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 (3.0)
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 677 Technical Support Skills (3.0)
Overview of the evaluation, purchase, installation and ongoing management and maintenance of computer systems and related software for instruction and staff productivity.

EDTD 695 Teleteaching and Distance Education (3.0)
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 (1.0-3.0)
By arrangement with dean and advisor.

EDTD 698 Supervised Readings (1.0-3.0)
By arrangement with advisor.

EDTD 699 Thesis or Professional Paper (2.0-5.0)
Prerequisite: EDFD 600; consent of dean and advisor.

EDTD 730 Doctoral Seminar in Training and Development (1.0-3.0)
Prerequisites: Admission into the Ed. D. program or consent of the instructor, and consent of the student's advisor.
It is designed to expose students to the work of other doctoral students, faculty members, and other research professionals in human resource development.

EDTD 740 Advanced Internship in Training and Human Resource Development (2.0-6.0)
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.

Teaching and Learning

EDTL 501 General Methods (3.0)
Prerequisites: Admission to the MAT program.
Prepares pre-service teachers to: identify appropriate learning goals for students; design learning experiences that include a variety of developmentally appropriate instructional strategies; manage a range of students, materials, and classroom activities; and honor students' diversity with respect to learning style, motivation, race/ethnicity, gender, and language proficiency.

EDTL 502 Exploring Teaching in the Sociopolitical Contexts of P-12 Schools (3.0)
Prerequisites: Admission to the MAT program.
The sociocultural contexts of P-12 teaching are ever shifting. Society's expectations for schools and the role that teachers are expected to assume must be understood in relation to the social, cultural, political, and historical contexts from which they arise. Teacher candidates must be made aware of the ways in which these multiple and overlapping contexts influence their future work as classroom teachers.

EDTL 503 Developing Cross-Cultural Competence: Teaching Students from Diverse Backgrounds (3.0)
Prerequisites: Admission to the MAT program.
Extends the principles of curriculum, development, teaching and learning introduced in previous courses to working with students from diverse, ethnic, racial, linguistic, and socioeconomic backgrounds.

EDTL 504 Teaching with Technology (2.0)
Prerequisites: Admission to a teacher education program and completion of, or concurrent enrollment in , a content methods course.
Leading teachers to understand and apply current technologies in classroom instruction. The tools of technology are explored for their creative application in education of B-12 children across the curriculum.

EDTL 505 Challenging Advanced Learners (1.0)
Prerequisites: Admission to a teacher education program and completion of, or concurrent enrollment in, a content methods course.
Study of methods for identifying gifted/talented students and differentiating curriculum and instruction to meet their needs.

EDTL 602 Exploring Teaching in the Sociopolitical Contexts of P-12 Schools (3.0)
Prerequisites: Admission to the MAT program.
The sociocultural contexts of P-12 teaching are ever shifting. Society's expectations for schools and the roles that teachers are expected to assume must be understood in relation to the social, cultural, political, and historical contexts from which they arise. Teacher candidates must be made aware of the ways in which multiple and overlapping contexts influence their future work as classroom teachers.

EDTL 603 P-5 Language Arts Methods (3.0)
Prerequisites: Admission to the P-5 MAT Professional Year Education Program.
Examines specific strategies and practices for teaching children with and without disabilities, giftedness, and other individual differences in grades P-5.

EDTL 604 P-5 Mathematics Methods (3.0)
Prerequisites: EDTL 602, ECPY 607, EDTL 501
Investigation of trends, learning theories, instructional activities, and manipulative materials applicable to mathematics education in the elementary school. The focus of this course is on means for improving the teaching of mathematics in the elementary school for all learners. Particular attention will be given to the implementation of the National Council of Teachers of Mathematics' Principles and Standards for School Mathematics. In addition, there will be an emphasis on developmental approach to mathematics learning, teaching, and assessment.

EDTL 605 Teaching Elementary School Science (3.0)
Prerequisites: EDTL 602, ECPY 607, EDTL 501.
Examines the instructional methods and curricular materials appropriate for teaching the concepts and skills of science in grades P-5.

EDTL 606 P-5 Social Studies Methods (3.0)
Prerequisites: EDTL 602, ECPY 607, EDTL 501.
Examines specific strategies and practices for teaching social studies to all children in grades P-5.

EDTL 607 Middle School Special Methods (3.0)
Prerequisites: EDTL 602, ECPY 607, EDTL 501.
Study of methods and materials in teaching, appropriate to the field of English. This course is part of the professional sequence of courses for English majors seeking middle or secondary certification.

EDTL 608 Middle School Special Methods (3.0)
Prerequisites: EDTL 602, ECPY 607, EDTL 501.
Study of methods and materials in teaching, appropriate to the field of English. This course is part of the professional sequence of courses for English majors seeking middle or secondary certification.

EDTL 615 Student Teaching in the Elementary Grades (3.0)
Prerequisites: Passing mid-program assessment of teacher certification program.
Supervised observation, participation, and teaching in elementary schools, with two placements of seven weeks each, one in primary and the other in intermediate grades.

EDTL 616 Student Teaching in the Elementary Grades (3.0)
Prerequisites: Passing mid-program assessment of teacher certification program.
Supervised observation, participation, and teaching in elementary schools, with two placements of seven weeks each, one in primary and the other in intermediate grades.

EDTL 617 Student Teaching in the Middle School (3.0)
Prerequisites: Passing mid-program assessment of teacher certification program.
Supervised observation, participation, and teaching in middle school, with two placements of seven weeks in each content teaching major.

EDTL 618 Student Teaching in the Middle School (3.0)
Prerequisites: Passing mid-program assessment of teacher certification program.
Supervised observation, participation, and teaching in middle school, with two placements of seven weeks in each content teaching major.

EDTL 619 Student Teaching in the High School (3.0)
Prerequisites: Passing mid-program assessment of teacher certification program.
Supervised observation, participation, and teaching in the content teaching major in high school.

EDTL 620 Reading and Writing Across the Curriculum/Adolescent Literature (3.0)
Exploring the processes, products and values of literacy in various areas of the curriculum, this course explores and applies literature of all forms in service to the various disciplines and societal roles.

EDTL 621 Intensive Field Experience (3.0)
Prerequisites: Concurrent enrollment in one or more methods classes (EDTL 603-606 or EDTL 607/608).
Field experience observing, analyzing, participating, and teaching in schools. Students will connect coursework, theory, and practice.

EDTL 622 Orientation and Readings (3.0)
Prerequisites: Admission to the M.Ed. Program.
Read, discuss and write about current literature related to the key Program Concepts within discipline specific fields as well as across content areas, and develop a well-designed research study. Goals and themes of the program will be studied. Students will investigate the literature base supporting the overarching concept of the program: Teaching for Knowledge, Leadership and Change: Enabling Success for All Learners.

EDTL 623 Leadership and Change (3.0)
Prerequisites: Admission to the M. Ed. program.
Exploration of the relationship between school leadership and school change, with an emphasis on teachers' roles as agents of change and members of school communities. Course satisfies Leadership and Change requirement toward M. Ed. in P-12 Education.

EDTL 624 Curriculum Theory (3.0)
Prerequisites: Admission to the M.Ed. program.
Study of significant curriculum theories as they relate to American schooling historically and today. While primarily an opportunity for exploring theory and philosophy of curriculum, students will be encouraged to link theory to practice.

EDTL 625 Social and Ethical Development in Teaching (3.0)
Study of theoretical and practical constructs that foster caring and integration of children's and adolescents' intellectual, ethical, and social development in the classrooms.

EDTL 626 Affirming Diversity (3.0)
Examines the definitions and practices of multicultural approaches to education by placing it in the broader contexts of schooling and society.

EDTL 627 Capstone Course (3.0)
Prerequisites: Completion of 70 percent of M.Ed. courses.
Continue to read, discuss and write about literature related to the Key Program concepts of the program, Teaching for Knowledge, Leadership and Change: Enabling Success for All Learners, within discipline specific fields as well as across content areas and share the impact and learnings associated with the students' courses of study. Each student will develop a professional portfolio highlighting their growth in the program concepts and in the appropriate professional standards for their area.

EDTL 630 Technology Applications for Mathematics and Science Teachers (3.0)
Prerequisites: Admission to 8-12 M.Ed. or MAT program.
Methods, techniques, and materials of instruction for meaningful and appropriate use of technology for the teaching of mathematics and science in the middle and high school. Equipment and computer software used in the course as well as student projects required will vary according to advances in the available technology and the interest of prospective students.

Education

EDUC 501 Pre-Teacher Education Core I (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 629 Interdisciplinary Seminar in Early Childhood (3.0)
An interdisciplinary seminar focusing on a variety of topics and issues relevant to early childhood.

EDUC 790 Doctoral Dissertation Seminar (3.0)
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 (1.0-15.0)
Prerequisite: Completion of coursework for Ed.D. program or successful completion of comprehensive examinations.
Note: Cross-listed with EDAD/ECPY/EDSP 795.

Engineering Management

EM 510 Industrial Accounting (3.0)
Prerequisite: Graduate/Professional or Graduate School standing.
Fundamentals of financial accounting, accounting systems, cost accounting, and budgetary control systems for use in managing engineering organizations.

EM 515 Operations Research I: Deterministic Models (3.0)
Prerequisite: Matrix Methods for Algebraic and Differential Equations (EAC 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 550 Probability and Statistics for Engineers (3.0)
Prerequisites: EAC 201 or equivalent.
Study of the laws of probability, discrete and continuous probability distributions, point and interval estimation, tests of hypothesis, simple and multiple linear regression, and the analysis of variance.

EM 560 Construction Management (3.0)
Prerequisite: Graduate/Professional or Graduate School standing or special student 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 (3.0)
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 (1.0-6.0)
Prerequisite: Graduate/Professional or Graduate School standing.
A theoretical or experimental investigation of an engineering management problem.

EM 611 Analysis of Organizational Structures (3.0)
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 (3.0)
Prerequisite: Engineering Statistics for Industrial Engineers (IE 360).
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Engineering statistics for Industrial Engineers (IE 360) or Probability and Statistics for Engineers (CECS 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 (3.0)
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 (3.0)
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 (1.0-8.0)
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 (1.0-6.0)

EM 694 Special Topics in Engineering Management (1.0-6.0)
A theoretical or experimental investigation of an engineering management problem.

EM 695 Engineering Management Seminar (1.0-6.0)

EM 697 M.S. Thesis in Engineering Management (1.0-6.0)

EM 699 Engineering Management M. Eng. Project (3.0)
Prerequisites: Completion of at least 18 credits of the required 27 credits of Engineering Management course work.
Students carry out an engineering project under the supervision of a faculty mentor, prepares a written report describing the project, and presents a seminar reporting the results of the project.

English

ENGL 501 Independent Study (3.0)
Prerequisite: Overall average of 3.0, an average of 3.5 in the department, and at least 18 semester hours credit in the department.

ENGL 502 Independent Study (3.0)
Refer to: ENGL 501

ENGL 503 Advanced Creative Writing I (3.0)
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 (3.0)
Prerequisite: ENGL 503 and consent of instructor.
A continuation of 503, but individuals concentrate on a given form. Spring.

ENGL 505 Advanced Technical Writing (3.0)
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 (3.0)
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 (3.0)
Readings in the original language of Old English prose and poetry.

ENGL 518 Foundations of Language (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics, or groupings of writers from the Tudor and/or Elizabethan periods.

ENGL 543 Studies in Stuart and Commonwealth Literature (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics or groupings of writers from the Stuart and/or Commonwealth periods.

ENGL 544 Studies in Restoration and Eighteenth-Century British Literature (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics or groupings of writers of the period from 1660 to 1800.

ENGL 545 Studies in British Literature of the Romantic Period (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics, or groupings of writers of the Romantic period.

ENGL 546 Studies in British Literature of the Victorian Period (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics, or groupings of writers from the Victorian period.

ENGL 547 Studies in Modern British and/or Irish Literature (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics, or groupings of writers from the turn of the century through 1950.

ENGL 548 Studies in Contemporary British and/or Irish Literature (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics, or groupings of writers since 1950.

ENGL 549 Studies in Post-Colonial and/or Ethnic Literature (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics, or groupings of writers in post-colonial and/or ethnic literature.

ENGL 550 Studies in African American Literature (3.0)
Prerequisites: ENGL 102 or 105, junior standing.
Note: Cross-listed with PAS 551.
In-depth study of selected movements, topics, or groupings of African American writers.

ENGL 551 Special Topics in Literature in English (3.0)
Topics to be announced in Schedule of Courses. A maximum of 6 hours in special-topics courses may be counted toward the major.

ENGL 552 Special Topics in Literature in English (3.0)
Refer to: ENGL 551

ENGL 561 Chaucer (3.0)
Prerequisite: ENGL 102 or 105, and junior standing.
Close reading of the major works, in the context of medieval traditions and fourteenth-century English society.

ENGL 562 Shakespeare (3.0)
Intensive study of selected drama and poetry of Shakespeare.

ENGL 563 Milton (3.0)
Intensive study of the poetry; background reading in Milton's biography and prose.

ENGL 564 Selected Figures in American Literature (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
Study of the works of a selected writer or grouping of writers, in literary, biographical, and/or social context.

ENGL 567 Post-Colonial Voices: Writing Experience in African Literature (3.0)
Prerequisites: English 102 or 105, and junior standing.
Note: Cross listed with PAS 567
Examination of "post-coloniality" through a selection of fiction and literary criticism by African writers.

ENGL 571 Studies in American Literature to 1865 (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics or groupings of writers before 1865.

ENGL 572 Studies in American Literature, 1865-1910 (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics, or groupings of writers from the Civil War to 1910.

ENGL 573 Studies in American Literature, 1910-1960 (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics or groupings of writers from 1910 to 1960.

ENGL 574 Studies in American Literature, 1960 - Present (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected movements, genres, topics or groupings of writers in contemporary American literature.

ENGL 575 Genre Studies in African-American Literature (3.0)
Prerequisites: ENGL 102 or 105, junior standing.
Note: Cross-listed with PAS 575.
In-depth study of a selected genre of African-American Literature.

ENGL 577 The Harlem Renaissance (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
Note: Cross-listed with PAS 577.
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 Studies in Renaissance Drama (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of dramatic works by Shakespeare's contemporaries.

ENGL 586 Studies in American Drama (3.0)
Prerequisite: ENGL 102 or 105, junior standing.
In-depth study of selected American plays.

ENGL 591 History of Criticism: Plato to the New Criticism (3.0)
Prerequisite: ENGL 102 or 105, and ENGL 310.
Study of selected theories for the interpretation of literary and other texts, from Plato to the New Criticism.

ENGL 599 Advanced Studies in English (3.0)
Prerequisites: ENGL 310, junior standing.
Note: Approved for the General Education requirement in written communication (WR).
In-depth analysis of and intensive writing about a focused area of study within the discipline of English.

ENGL 601 Introduction to English Studies (3.0)
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 (3.0)
Introduction to the design of the freshman composition syllabus, writing assignments, and ways of responding to them.

ENGL 603 Studies in Genres (3.0)
A course in genre studies, featuring in any given semester the drama, biography, the essay, satire, etc.

ENGL 606 Creative Writing I (3.0)
Prerequisites: Permission of instructor or enrollment in a degree program in English.
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 (3.0)
Prerequisites: Permission of instructor or enrollment in a degree program in English.
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 Independent Study (1.0-3.0)

ENGL 614 Independent Study (1.0-3.0)
Refer to: ENGL 613

ENGL 615 Thesis Guidance (1.0-6.0)

ENGL 620 Research in the Composing Process (3.0)
Examination of the major methodologies, quantitative and qualitative, in composition research, with their underlying theoretical assumptions.

ENGL 621 Sociolinguistics (3.0)
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 (3.0)
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 (3.0)
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 (1.0)
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 (3.0)
Intensive survey of representative non-Shakespearean dramatic works produced in Renaissance England, with attention to literary traditions and modern critical approaches.

ENGL 632 Shakespeare (3.0)
Intensive study of a large cross-section of the plays, with attention to modern critical approaches.

ENGL 633 Sixteenth-Century Poetry and Prose (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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.

ENGL 661 Nineteenth-Century American Fiction (3.0)
Intensive survey of a diversity of fictional forms and literary and intellectual traditions, with attention to modern critical approaches.

ENGL 662 Nineteenth-Century American Poetry and Prose (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
A survey or intensive sampling of contemporary poetry.

ENGL 670 Composition Theory and Practice (3.0)
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 (3.0)
Review of rhetorical theory and practice in the Greek, Roman, early Christian, medieval, and scholastic periods.

ENGL 672 History of Rhetoric II (3.0)
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 (3.0)
Selected topics in the rhetorical analysis of fictional and nonfictional texts.

ENGL 674 Interdisciplinary Studies in Rhetoric and Composition (3.0)
Topics can include cognition and composition, the social construction of knowledge, feminist theory and composition, etc.

ENGL 675 Studies in Professional Writing (3.0)
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 (3.0)
Involves discussion and analysis of advanced research topics leading to the dissertation.

ENGL 682 Seminar in Linguistics (3.0)
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 (3.0)
Involves discussion and analysis of advanced research topics leading to the dissertation.

ENGL 686 Seminar in American Studies (3.0)
Involves discussion and analysis of advanced research topics leading to the dissertation.

ENGL 687 Seminar in Rhetorical Studies (3.0)
Prerequisite: ENGL 602.
Advance investigations in rhetoric and composition under a variety of special topics.

ENGL 690 Dissertation Research (1.0-12.0)

ENGL 691 Contemporary Theories of Interpretation (3.0)
A selective survey of theories of interpretation from the New Criticism to the present, and of interpretive practices based on these theories.

Expressive Therapies

ET 601 Clinical Art Therapy I: Theories (3.0)
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 (3.0)
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 (2.0)
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 (2.0)
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 (2.0)
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 (1.0)
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 (3.0)
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 (3.0)
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 (5.0)
Prerequisite: Completion of all academic work; art therapy majors only.
Art therapy practice at local setting.

ET 624 Practicum II (5.0)
Prerequisite: Art therapy majors only.
Art therapy practice at local or national setting.

ET 630 Multicultural Issues in Art Therapy:Cultural Self Identification and Personal (2.0-3.0)
Self exploration of culture and ethnicity will help students recognize their cultural and ethnic bias and prejudices. Course will enable students to become cognizant of their own ethnicity, socioeconomic background, unexamined assumptions and sterotypes of those different from themselves.

ET 633 Independent Study in Expressive Therapies (1.0-3.0)
Prerequisite: Consent of instructor,graduate standing.
Independent literature search on the topic of a student's choice to give the student an opportunity to explore different topics and applications of art therapy and expressive therapies.

ET 636 Expressive Therapies Seminar (1.0-3.0)
Prerequisite: Consent of instructor.
Special topics or experimentation in expressive therapies.

ET 642 Symbols of Self-Actualization (2.0)
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.

ET 646 Expressive Techniques in Psychotherapy (2.0)
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 (2.0)
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 (2.0)
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 (2.0)
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 653 Grief Counseling (2.0)
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 655 Art for Children with Special Needs (2.0)
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 (3.0)
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.

Exercise Physiology

EXP 501 Applied Exercise Physiology (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Reviews, presentations and discussions of current topics in exercise physiology.

EXP 604 Advanced Topics in Exercise Physiology (1.0-3.0)
Prerequisite: EXP 600 or consent of instructor.
Independent study under the guidance of a selected faculty member.

EXP 605 Human Physiology (3.0)
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 (3.0)
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) (3.0)
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 (3.0-6.0)
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 (1.0-6.0)
Prerequisite: Consent of advisor.
Pass/Fail.

Finance

FIN 500 Business Finance (3.0)
Prerequisites: ACCT 500, ECON 500, MGMT 501.
An introduction to financial concepts from the corporate perspective. Topics include the basics of financial statements, an overview of the financial markets, risk and return, the time value of money, security valuation using time value concepts, cash flow determination and valuation, and long-term capital investment.

FIN 600 Financial Management (3.0)
Prerequisites: FIN 500, ACCT 600, ECON 600, MGMT 600, MKT 600, CIS 675, MGMT 610.
A study of the financing and investment decisions of the firm. Topics include valuations of firms and securities in the old andnew economy, market efficiency,EVA and MVA, derivatives and hedging, alternative financing mechanisms (e.g. lease/buy, venture capital), managing uncertainty, agency theory, financial e-commerce, financial architecture, financial distress, global finance, and other related topics

FIN 620 Financial Institutions and Capital Markets (3.0)
Prerequisites: FIN 600.
A study of financial services firms including the domestic and international markets in which they operate. Topics include money and capital markets, interest rate theory, security valuation, derivatives and immunization, and the characteristics of a financial services firm.

FIN 630 Investment Analysis (3.0)
Prerequisites: FIN 600.
The analysis of the process and environment of investment under conditions of uncertainty. The relevance, applicability, and durability of " Old Economy" valuation models and analytical techniques in the " New Economy" are explored and assessed.

FIN 670 International Finance (3.0)
Prerequisites: FIN 600.
A study of financial principles that are critical to the management of an enterprise in a global business environment. Topics include exchange rates, parity conditions, capital flows, and international banking. Capital formation, budgeting and hedging are discussed within an international context.

FIN 680 Special Topics in Finance (1.0-6.0)
An advanced study of one or more selected topics or issues related to the study of Finance.

FIN 698 Research Seminar in Finance (1.0-3.0)
Prerequisite: One 600-level course in finance and permission of departmental chair.

Foreign Language Education

FLE 521 Teaching Techniques in Foreign Languages (3.0)
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 Independent Study (1.0-3.0)
Prerequisite: Consent of instructor.
Designed for independent study projects in foreign language education.

FLE 562 Independent Study (1.0-3.0)
Refer to: FLE 561

FLE 600 Summer Workshop for Foreign Language Teachers (3.0)
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 (3.0)
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 (3.0)
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.

FLE 623 Culture as the Basis of Foreign Language Teaching (3.0)
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 (3.0)
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.

French

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 E xchange (3.0-6.0)
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 506 Francophone Women Writers (3.0)
Prerequisites: FREN 321 and 322 or faculty consent.
Readings of literary and non-literary texts by women of the French-speaking world.

FREN 522 French Phonetics and Diction (3.0)
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 Communication Skills (3.0)
Prerequisite: FREN 321-322 or faculty consent.
Oral and written expression, emphasizing style and vocabulary.

FREN 524 Practical French Linguistics for Teachers (3.0)
Prerequisites: FREN 321 and 322 or faculty consent.
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 531 Special Topics in Literature and Cultural Studies (3.0)
Prerequisites: FREN 455 or faculty consent.
An intensive study of an aspect of French or Francophone literature and/or culture.

FREN 561 Independent Study I (1.0-3.0)
Prerequisite: Consent of department.
Independent study in areas not covered in the regular curriculum.

FREN 562 Independent Study II (1.0-3.0)
Refer to: FREN 561

FREN 599 Special Topics (3.0)
Prerequisite: Consent of instructor.
Topics of a unique or specialized nature in French language, literature or culture.

FREN 670 Special Topics (3.0)
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 (3.0)
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 (3.0-6.0)

Geography

GEOG 501 Kentucky Field Course (3.0)
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 510 Geography of the Ancient World (3.0)
Prerequisites: GEOG 201 or HIST 101 or ARTH 250, and two 300 level courses in Geography, Anthropology, History, Art History or Humanities, or consent of instructor.
Geographic study of ancient Europe, the Mediterranean Basin,Nile Valley, and Mesopotamia, with emphasis on sacred places, belief systems, environment, and gender-related issues.

GEOG 520 Geography and Nutrition Among African and African-American Populations (3.0)
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 530 Transportation Geography (3.0)
Prerequisite: GEOG 256, GEOG 327 or consent of instructor.
An 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 (3.0)
Prerequisite: GEOG 327 and 356 or faculty consent.
Note: Spring only.
Examination of market structure, retail environment and physical site characteristics. Utilizes current practices in discipline to determine optimum retail location.

GEOG 541 Teaching Geography (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
An analysis of the morphology, development and function of central business districts with a special emphasis on downtown Louisville.

GEOG 590 Special Topics (3.0)
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 (1.0-4.0)
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 (1.0-4.0)
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 620 Geography & Nutrition Among African and African American Populations (3.0)
Note: Crosslisted with PAS 660.
An in-depth examination of the nutritional status of Africans, African-Americans and persons of African descent. The course will focus on comparison of epidemiological transition, political economy of nutrition, politics of food welfare programs, food aid, over-nutrition (obesity), under-nutrition and dietary-related diseases among African-Americans, Africans and persons including blacks in the Diaspora.

GEOG 628 Planning History and Issues (3.0)
Prerequisites: Consent of instructor.
Crosslisted with: PLAN 600.
The history of planning and contemporary issues with an emphasis on roles of planners, zoning and law.

GEOG 631 Urban Demography (3.0)
Prerequisites: Graduate Standing
Note: Crosslisted with PLAN 618.
Spatial analysis of the distribution, characteristics, growth, and change of the population of a metropolitan area.

GEOG 635 Retail Site Analysis (3.0)
Prerequisites: GEOG 327 or Urban Economics or consent of the instructor.
Note: Crosslisted with PLAN 614.
Examination of market structure, retail environment and physical site characteristics. Utilizes current practices in the discipline to determine optimum retail location.

GEOG 641 Teaching Geography (3.0)
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 (3.0)
Prerequisites: Statistics course.
Note: Crosslisted with PLAN 615.
The analysis of spatial patterns and processes through the use of spatially based statistics.

GEOG 657 Geographic Information Systems (3.0)
Note: Crosslisted with UPA 629 & PLAN 608.
Application of GIS to real world projects. An emphasis will be placed on the development of a digital spatial database.

GEOG 658 Analytical Urban Geography (3.0)
Prerequisites: Urban Geography (GEOG 328, Urban Socilogy (SOC 305) or consent of instructor.
Note: Crosslisted with PLAN 616.
Advanced analysis of urban spatial processes and patterns with an emphasis on quantitative models.

GEOG 690 Special Topics (1.0-3.0)
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 (1.0-5.0)

Geosciences

GEOS 510 Earth & Space Science for Teachers (3.0)
Prerequisite: Junior standing.
2 lecture; 2 lab.
Principles of the Earth Sciences and their application to the local region; identification of common minerals, rocks, and fossils.

GEOS 564 Hydrology (3.0)
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 Natural Hazards (3.0)
Prerequisite: GEOS 201 or 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 (3.0)
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 610 Earth and Space Science for Teachers (3.0)
Principles of the Earth Sciences and their applications to the local region; identification of common minerals, rocks and fossils. Graduate Students only.

GEOS 691 Research and Independent Study (1.0-5.0)

German

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 (1.0-15.0)
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.

GERM 501 Survey of German Literature I (3.0)
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 502 Survey of German Literature II (3.0)
Refer to: GERM 501

GERM 515 Studies in Eighteenth-Century Literature (3.0)
Prerequisite: Consent of instructor.
Readings selected from the Enlightenment, Storm and Stress, and Weimar Classicism.

GERM 517 Studies in Nineteenth-Century Literature (3.0)
Prerequisite: Consent of instructor.
Readings selected from Romanticism, Realism, Naturalism, and Impressionism.

GERM 518 Studies in Twentieth-Century Literature (3.0)
Prerequisite: Consent of instructor.
Readings selected from the turn of the century to the present.

GERM 519 German Intellectual History (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Chronological survey of important manifestations of German culture.

GERM 561 Independent Study (3.0)
Prerequisite: Consent of department.
Independent study in areas not covered in the regular curriculum.

GERM 599 Special Topics (3.0)
Prerequisite: Consent of instructor.
Topics of a unique or specialized nature in German language, literature or culture.

GERM 680 Seminar (3.0)
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 (3.0-6.0)

Graduate Interdisciplinary

GS 683 College Teaching (3.0)
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 (1.0-12.0)
Prerequisite: Major in Interdisciplinary Studies.

Healthcare Administration

HADM 620 Introduction to the Business of Healthcare Systems (3.0)
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 (3.0)
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.

HADM 632 Healthcare Law (3.0)
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 (1.0-3.0)
Advanced study in one or more selected topics or issues related to the study of healthcare administration.

HADM 698 Research Seminar in Healthcare Administration (1.0-6.0)
Prerequisite: HADM 620 and permission of program head.

History

HIST 501 Independent Study (3.0)

HIST 502 Independent Study (3.0)
Refer to: HIST 501

HIST 503 Advanced Studies in History (3.0)
Prerequisite: Consent of instructor.
Selected topics in history that cross traditional geographic or chronological boundaries.

HIST 504 Philosophy of History (3.0)
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 (3.0)
An analysis of artistic expression and intellectual discourses of the nineteenth century, with attention to different methodologies of cultural interpretation.
HIST 211-212 is recommended.

HIST 508 American Environmental History (3.0)
Prerequisite: Consent of instructor.
Relationship between economic development and environmental change, focusing on America, pre-Colonial to present.

HIST 510 Studies in American History (3.0)
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 (3.0)
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.

HIST 512 History of the Jews in America (3.0)
The experience of Jews in America from the seventeenth century to the present, with attention to topics such as demography, the immigrant experience, anti-Semitism, religious movements and cultural developments.

HIST 514 United States Peace Movement (3.0)
Prerequisites: Junior standing or faculty consent.
History of the peace movement in the United States from the beginning to the present. The course also examines nonviolent civil disobedience throughout U.S. history. Concentration on the twentieth century with the main focus being the Vietnam Anti-war movement.
HIST 314 is recommended.

HIST 515 American Legal History (3.0)
Prerequisites: Junior standing or faculty consent.
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 (3.0)
Prerequisites: Junior standing or faculty consent.
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 (3.0)
Prerequisites: Junior standing or faculty consent.
The drafting and ratification of Constitution, establishing the national government, development of political parties, foreign policies, financial aid, and economic development.

HIST 521 Colonial America to 1765-WR (3.0)
Prerequisites: Junior standing or consent of instructor.
History of North America, focusing on the British Colonies, beginning with the first native Americans, to the end of the Seven Years War.

HIST 522 The American Revolution and the Confederation (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisites: Junior standing or faculty concent.
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
The interaction of political, economic, social, and intellectual forces in the shaping of foreign and domestic policy.

HIST 530 U.S. and Nicaragua- WR (3.0)
Prerequisites: Junior standing or faculty consent.
Analysis of the diplomatic relations between the United States and Nicaragua, concentrating on the 20th Century.
HIST 314 is recommended.

HIST 533 Twentieth-Century Latin America (3.0)
Prerequisites: Junior standing or faculty consent.
The history of Latin America since 1900, with special emphasis upon the problems of social change and revolution.
HIST 332 is recommended.

HIST 534 The U.S. and Latin America (3.0)
Prerequisites: Junior standing or faculty consent.
The history of the international relations of the United States with the nations of Latin America, emphasizing economic, political, and ideological development.
HIST 314 is recommended.

HIST 537 Black Radicalism (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisites: Junior standing or faculty consent.
Note: Approved for the General Education requirement in written communication (WR).
Topics to be chosen by instructor (e.g., the Ancient Historians).
HIST 342-343 is recommended.

HIST 545 Studies in the Ancient Near East (3.0)
Prerequisites: Junior standing or faculty consent.
Topics to be chosen by the instructor (e.g., social and legal institutions).

HIST 547 Studies in Russian History (3.0)
Prerequisites: Junior standing or faculty consent.
Topics to be chosen by instructor (e.g., the early church, formation of the Russian state, administration, liberalism, the purges).

HIST 551 Studies in Medieval History (3.0)
Prerequisites: Junior standing or faculty consent.
Intensive work in selected periods of medieval history (e.g., High Middle Ages, Europe in the fourteenth and fifteenth centuries).

HIST 552 Topics in Medieval History (3.0)
Prerequisites: Junior standing or faculty consent.
Intensive study of selected topics (e.g., makers of Europe; consensus and dissent in Medieval Society; cities and countryside in Medieval Europe).

HIST 553 The Medieval City (3.0)
Prerequisites: Junior standing or faculty consent.
Revival of urban centers following the commercial revolution, and evolution of public and private structures of urban living; 1000-1500 C.E.

HIST 554 Spain and Portugal in the Middle Ages (3.0)
History of the Iberian peninsulsa from the Muslim invasion of 711 to the Christian conquest of Granada in 1492, emphasizing cross-cultural exchanges and social interactions.

HIST 555 English Medieval History, 1066 to 1500 (3.0)
Prerequisites: Junior standing or faculty consent.
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 (3.0)
Prerequisite: Consent of instructor.
World War I: the military actions, diplomacy, technology, economics, and societies in the first total war.

HIST 561 U.S. and Vietnam (3.0)
Prerequisites: Junior standing or faculty consent.
Analysis of diplomatic relations between the United States and Vietnam, concentrating on the 20th Century.
HIST 314 is recommended.

HIST 562 The Middle Eastern Wars I (3.0)
Prerequisites: Junior standing or faculty consent.
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 (3.0)
Prerequisites: Junior standing or faculty consent.
European technological superiority and Ottoman defeat. The Austrian and Ottoman wars. Balkan Wars. World War I. Turkish War of Independence.

HIST 571 The Renaissance (3.0)
Prerequisites: Junior standing or faculty consent.
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 (3.0)
Prerequisites: Junior standing or faculty consent..
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 352 is recommended.

HIST 575 Tudor England, 1485-1603 (3.0)
Prerequisites: Junior standing or faculty consent.
Intensive study of selected aspects of the period: Humanism, Reformation, government and society, court and culture.
HIST 366 is recommended.

HIST 577 The French Revolution and Napoleon (3.0)
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 579 History of European Ideas: Selected Topics (3.0)
Prerequisites: Junior standing or faculty consent.
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 (3.0)
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. (3.0)
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 (3.0)
Prerequisites: Junior standing or faculty consent.
Survey of factors which produced the Hitler regime, and the events which spelled its demise.

HIST 587 The Russian Revolutions (3.0)
Prerequisites: Junior Standing or faculty consent.
Intensive examination of the Russian revolutions of 1905 and 1917, their chronology, their causes, historiographical issues.

HIST 588 Feminism in Western Civilization, 1790-1920 (3.0)
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 (3.0)
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 (3.0)
Prerequisites: Junior Standing or faculty consent.
Note: Cross-listed with PAS 590.
Intensive study of a particular topic chosen by the instructor (e.g., slavery and the slave trade, traditional kingdoms)
9 hours of HIST or PAS 590 is recommended.

HIST 593 American Image of the Middle East (3.0)
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 (3.0)
Prerequisites: Junior standing or faculty consent.
Selected topics in Middle Eastern history and societies.

HIST 595 Principles of Cultural History (3.0)
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 (3.0)
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 (3.0)
Introduction to nature, history, and methods of Public History. Emphasis on relationship of historical scholarship to nonacademic applications.

HIST 598 Introduction to Archives Administration (3.0)
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 (3.0)
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 Directed Study (3.0)

HIST 602 Directed Study (3.0)
Refer to: HIST 601

HIST 603 Thesis (3.0)

HIST 605 Research Methods and Materials (3.0)
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 607 Oral History as a Research Methodology (3.0)
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 (3.0)
Prerequisites: Consent of instructor. Supervised experience in a public history setting.

HIST 611 Studies in American History (3.0)

HIST 612 Studies in American History (3.0)
Refer to: HIST 611

HIST 613 The Teaching of History (3.0)

HIST 621 Seminar in American History (3.0)

HIST 622 Seminar in American History (3.0)
Refer to: HIST 621

HIST 625 History of American Education (3.0)
Examination of the function of educational processes in the context of American political, economic, and social history.

HIST 629 Studies in Military History (3.0)
Advanced reading in the fundamental works of military history.

HIST 651 Studies in Medieval History (3.0)

HIST 652 Seminar in Medieval History (3.0)

HIST 662 Seminar in Early Modern European History (3.0)

HIST 682 Studies in Modern European History (3.0)

HIST 683 Seminar in Modern European History (3.0)

Health Promotion, Physical Education and Sport Studies

HPES 501 Stress and Tension Control (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Principles of nutrition with special emphasis on nutrient and energy needs of athletes of optimal performance.

HPES 531 Leadership in Health Promotion (3.0)
Note: Crosslisted with HPES 631.
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 (3.0)
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 Issues (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
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 (1.0-3.0)

HPES 601 Philosophy of Sport and Physical Education (3.0)
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 (3.0)
Prerequisite: HPES Tests and Measurements (HPES 377)
Techniques used in developing the research project. Development of outline for action research project.

HPES 605 Teaching and Learning for Elementary Physical Education (6.0)
Philosophy, objectives, curriculum and methods of teaching physical education to elementary students. Must be taken prior to student teaching.

HPES 606 Teaching and Learning for Secondary Physical Education (6.0)
Philosophy, objectives, curriculum and methods of teaching physical education to secondary students. Must be taken prior to student teaching.

HPES 607 Methods of Supervision in Physical Education (3.0)
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 (3.0)
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 609 Methods in Practical Living: Health (3.0)
Prerequisites: Admission to the MAT in Physical Education Program.
Designed to cover strategies and methods for delivering health education related to practical living skills.(KERA) at the middle school and secondary school level.

HPES 610 Experiential Outdoor Education Leadership (3.0)
Prerequisite: Admission to M.A.T.
Teaches necessary skills to lead outdoor experiential education programs.

HPES 611 Seminar in Student Teaching in Physical Education (3.0)
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 (6.0)
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 (6.0)
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 (3.0)
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.

HPES 618 Diverse Populations in Physical Activity and Health (3.0)
The study of social and cultural system of diverse groups, related to physical activity and health.

HPES 619 Practicum: Psychomotor Assessment of Dysfunctions in Adapted Physical Activity (3.0)
Administration of tests of psychmotor functioning; interpretation of findings; writing the educational diagnosis; participation in multidisciplinary settings.

HPES 620 Instructional Design in Adapted Physical Activity (3.0)
Prerequisites: 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 deversified programs of developmental activities, games, sports, and rhythms suited to the interests, capabilities, and limitations of typical students.

HPES 621 Diagnostic/Assessment in Adapted Physical Activity (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 Leadership in Health Promotion (3.0)
Note: Crosslisted with HPES 531.
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 (3.0)
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 (3.0)
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 (3.0)
Examination of current literature, research and trends in HPES.

HPES 659 Motor Control and Learning: Lab (3.0)
Experiments in motor learning that promote the use of basic apparatus and practical applications of research.

HPES 660 Motor Control & Learning (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 692 Cooperative Internship/Practicum (1.0-3.0)
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 (1.0-3.0)
Examination of one or more selected topics in the study of Health Promotion, Physical Education, and Sport Studies.

HPES 699 Directed Readings in HPES (1.0-3.0)
Prerequisite: 15 hours of graduate credit or consent of instructor.
Supervised readings and written project relating to a specific research topic in health.

Humanities

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 500 Honors Thesis in Humanities (3.0)
Prerequisite: Junior standing; admission to Divisional Honors Program.
An intensive examination of a topical area in Humanities undertaken with a designated faculty director.

HUM 501 Independent Study (1.0-3.0)
Prerequisite: Approval of chair.

HUM 502 Independent Study (1.0-3.0)
Refer to: HUM 501

HUM 509 Interdisciplinary Theory: Arts and Humanities (3.0)
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 (3.0)
Prerequisite: Junior standing.
Historical perspective on methodologies in the study of religion: normative, empirical, hermeneutical, phenomenological and post-modernist (focus on gender, race, class, pluralism).

HUM 511 Topics in the Interpretation of Sacred Texts (3.0)
Prerequisite: Junior standing.
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 (3.0)
Prerequisite: Junior standing.
Study in depth of selected contemporary writers from major world religions.

HUM 513 Comparative Religion (3.0)
Prerequisite: Junior standing.
A critical study of similarities and differences in ideas about and attitudes toward significant themes in world religions.

HUM 514 Colloquium: Interreligious Dialogue (3.0)
Prerequisite: Junior standing.
A study of methodologies for interreligious dialogue and their applications in dialogue on significant issues or themes in world religions.

HUM 524 Special Topics in Film Study (3.0)
Prerequisite: HUM 324 or 325 or 326, and junior standing.
An in-depth study on a specific topic to be announced in the Schedule of Courses. May be repeated up to three times for different topics.

HUM 550 Internship in Arts and Humanities (3.0)
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 (2.0-3.0)
Prerequisite: Honors standing, junior standing, consent of division chair.
Readings in cultural history; oral and written reports.

HUM 561 Selected Topics (3.0)
Prerequisite: Junior standing.
Content to be indicated in the Schedule of Courses.

HUM 562 Selected Topics (3.0)
Prerequisites: Junior standing.
Content to be indicated in the Schedule of Courses.

HUM 581 Dante (3.0)
Prerequisite: Junior standing.
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 (3.0)
Prerequisite: Junior standing.
Study of fundamental aspects of ancient culture by means of individual readings and critical writing projects.

HUM 592 Perspectives on Medieval Culture (3.0)
Prerequisite: Junior standing.
Study of fundamental aspects of medieval culture by means of individual readings and critical writing projects.

HUM 593 Perspectives on Early Modern Culture (3.0)
Prerequisite: Junior standing.
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 (3.0)
Prerequisite: Junior standing.
Study of fundamental aspects of culture in the nineteenth and twentieth centuries by means of individual readings and critical writing projects.

HUM 595 Principles of Cultural History (3.0)
Prerequisite: Junior standing.
The 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 (3.0)
Prerequisite: Junior Standing.
Topics to be announced in Schedule of Courses.

HUM 601 American Thought and Culture (3.0)
Introduction to history of ideas in terms of twentieth-century American thought and culture.

HUM 609 Interdisciplinary Theory: Arts and Humanities (3.0)
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 (3.0)
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 (1.0-6.0)

HUM 650 Internship in Humanities and Civic Leadership (3.0-6.0)
Prerequisite: Approval of chair.
Note: Six credit hours are the maximum which can be credited toward the degree. Enrollment limited to students pursuing the concentration 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 Independent Study (3.0)
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 652 Independent Study (3.0)
Refer to: HUM 651

HUM 695 Seminar in Humanities (3.0)
Content to be indicated in Schedule of Courses.

Industrial Engineering

IE 503 Fundamentals of Engineering Examination Review (2.0)
Prerequisite: 4th Year Standing.
Review of topics covered on eight-hour NCEES Fundamentals of engineering supplied-reference examination. Not to be counted towards meeting the requirements for a degree.

IE 514 Linear Programming (3.0)
Prerequisites: EAC 205 or equivalent.
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 (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 360) and Introduction to Operations Research (IE 415).
A selection of the probabilistic topics of operations research are included: queuing and inventory theory, renewal and Markov processes, and simulation.

IE 522 Analysis and Design of Automated Manufacturing Systems (4.0)
Prerequisite: Graduate/Professional or Graduate School standing.
The analysis and design of manufacturing systems with emphasis on computer applications.

IE 530 Industrial Safety Engineering (3.0)
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 (3.0)
Prerequisite: Second-year professional school standing.
Topics include legal aspects of product liability, insurance, design, analysis, testing, and product safety in specific industries.

IE 541 Simulation (3.0)
Prerequisite: IE 360 or equivalent, IE 240, and IE 241.
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, and ARENA.

IE 542 Control of Machines and Processes (3.0)
Prerequisite: CEE 205, ECE 252, EAC 205, IE 320, and second year professional school or Graduate school standing.
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 (3.0)
Prerequisite: Matrix Methods for Algebraic and Differential Equations (EAC 205), Introduction to Electrical Engineering (ECE 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 550 Fundamentals of Logistics Systems (3.0)
Prerequisites: IE 360.
Fundamentals of logistic systems from an engineering perspective. Includes topics in all aspects of the supply chain including material handling, inventory management, warehousing, and transportation.

IE 563 Experimental Design in Engineering (3.0)
Prerequisites: Engineering Statistics for Industrial Engineers (IE 360).
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 565 Linear Statistical Models (3.0)
Prerequisites: IE 360 or equivalent.
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.

IE 570 Engineering Design Economics (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 360).
Fuzzy methodologies; applications to industrial and systems engineering; directions for future research.

IE 580 Engineering Cost Analysis (3.0)
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 (1.0-6.0)
Prerequisite: As specified by instructor.
A theoretical and/or experimental investigation of an industrial engineering design topic.

IE 599 Seminar in Industrial Engineering (1.0)
Prerequisite: Second-year professional school standing.
Presentation and/or discussions of topics of current interest.

IE 600 Advanced Manufacturing Methods (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: IE 540 and 600.
Topics include: analysis of flow lines, group technology, machine cell design, computer networking, and manufacturing automation protocol.

IE 610 Foundations of Optimization (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Probability and Statistics for Engineers (IE 360) and Introduction to Operations Research (IE 415).
Forecasting; inventory management; production planning; line balancing; case studies.

IE 631 Advanced Quality Control (3.0)
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 (3.0)
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.

IE 640 Applied Systems Analysis (3.0)
Prerequisites: Probability & Statistics for Engineers (IE 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 (3.0)
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 (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 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 (3.0)
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 (3.0)
Prerequisites: Facility Location and Layout (IE 321), Probability and Statistics for Engineers (IE 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 (3.0)
Prerequisite: Probability & Statistics for Engineers (IE 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 (3.0)
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 (3.0)
Application of the technologies of expert systems and simulation for manufacturing decision support and the development of intelligent decision systems.

IE 681 Human Performance (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-6.0)
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 (1.0-6.0)
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 (1.0)
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 (1.0-12.0)

IE 697 M. Eng.Thesis in Industrial Engineering (1.0-8.0)
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 699 Industrial Engineering M. Eng. Project (3.0)
Prerequisites: IE 599.
Students carry out engineering project under the supervision of a faculty mentor, prepares an acceptable written report, and presents a seminar on the project.

IE 700 Dissertation Research in Industrial Engineering (1.0-18.0)
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

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 (3.0)
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 610 Financial Strategy (3.0)
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 (3.0)
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 (3.0)
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 (9.0)
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 (1.0)
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 (1.0)
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.

Justice Administration

JA 520 Capital Punishment-WR (3.0)
Prerequisites: Senior standing or consent of instructor.
Seminar if issues related to the death penalty, including: constitutional questions, the effect of death row incarceration, and public attitudes toward the death penalty. Research on Kentucky will be featured.

JA 521 White Collar Crime-WR (3.0)
Prerequisites: JA 200 and JA 305 or consent of instructor.
A study of white collar and occupational crime. Course will focus on the concept, theoretical explanations, the extent and nature of various types of white collar and occupational crime in both public and private sectors.

JA 522 Serial Murder (3.0)
Prerequisites: Senior standing or consent of instructor.
Examination of serial murder in the United States. Topics include serial murder and its relation to race and gender; the myth of serial murder; the media and serial murder and profiling.

JA 576 Managing Organizational Performance (3.0)
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 (3.0)
An interdisciplinary seminar. Focuses on issues pertinent to the criminal justice system that reflect conflicting perspectives.

JA 597 Ethics in Criminal Justice (3.0)
Prerequisite: Senior standing or consent of instructor.
A study of the need for ethics in criminal justice. The aims of ethics, ethical theories, ethical issues related to law making, law breaking and law enforcement.

JA 602 History of Police in the United States (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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.

JA 640 Seminar in Crime Prevention and Social Control (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Study of contemporary issues concerning the philosophy, management, and operations of criminal justice agencies.

JA 670 Directed Studies/ Readings (3.0)
Prerequisite: Consent of chair and instructor.
Independent study or research project under the direction of a member of the faculty.

JA 690 Practicum (1.0-6.0)
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 (3.0)
Prerequisite: Consent of chair.
Preparation of a paper of publishable quality based on research under the direction of a faculty member.

JA 699 Thesis (1.0-6.0)
Prerequisite: Consent of chair.

Linguistics

LING 518 Foundations of Language (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: LING/ENGL 518.
Intensive investigation of selected topics in current linguistic theory or practice.

LING 600 Independent Study (1.0-3.0)
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 Syn Tax (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 632 SOCIOLINGUISTICS (3.0)
SOCIOLINGUISTICS

LING 641 Recent Philosophy of Language (3.0-30.0)
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 (3.0)
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 (3.0-6.0)

Modern Languages

M L 500 Study Abroad (1.0-15.0)
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 (3.0)
Prerequisite: Junior standing or faculty consent.
Note: Cross-listed with WMST 571.
Readings of literary and non-literary text by women of the French-speaking world.

M L 519 German Intellectual History (3.0)
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 Special Topics (3.0)
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 552 Special Topics (3.0)
Refer to: M L 551

M L 553 Selected Authors in Foreign Literature (3.0)
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 (3.0)
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 (3.0)
Introduction to graduate studies in foreign languages, history of field, research techniques, major areas of study, opportunities, ethics.

Mathematics

*The * designates courses that are essentially the same as similarly titled courses offered by the Department of Computer Engineering 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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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* (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: MATH 521.
Continuation in greater depth of topics introduced in MATH 521; introduction to theory of ideals, field extensions, and abstract vector species. Spring.

MATH 530 Matrix Analysis (3.0)
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 (3.0)
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 (3.0)
Prerequisite: MATH 535.
Continuation of MATH 535. Additional topics include probabilistic methods.

MATH 541 Elementary Topology (3.0)
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 (3.0)
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 (3.0)
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.

MATH 551 Geometry (3.0)
Prerequisite: a year of high-school geometry or Modern Geometry (MATH 155), Calculus I and 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 (3.0)
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 (3.0)
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* (3.0)
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* (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 Foundations of Actuarial Science (3.0)
Prerequisite: MATH 561.
Fundamental mathematical tools for quantitatively assessing risk. Application of these tools to problems encountered in actuarial science is emphasized. Covers the material of Examinaton 1 of the Society of Actuaries and Casualty Actuarial Society. Credit may not be applied toward a graduate degree in mathematics.

MATH 572 Theory of Interest (3.0)
Prerequisites: MATH 561.
Accumulation function and the special cases of simple and compound interest. Nominal and effective interest and discount rates and the force of interest - constant and varying. Valuation of discrete and continous streams of payments. Determination of yield rates on investments. Application of interest theory to amortization of lump sums, fixed income securities, depreciation mortgages. Covers the interest therory portion of the Examination 2 of the Society of Actuaries and the Casualty Actuarial Society.

MATH 573 Actuarial Models I (3.0)
Prerequisite: MATH 570, MATH 572.
Theoretical basis of actuarial models and the application of those models to insurance and other financial risks. The following specific models are introduced: Contingent Payment Models, Survival Models, Frequency and Severity Models, Compound Distribution Models, Stochastic Process Models, Ruin Models. Together with its continuation, Mathematics 574, covers the material on the Examination 3 of the Society of Actuaries and the Casualty Actuarial Society.

MATH 574 Actuarial Models II (3.0)
Prerequisite: MATH 573.
Continuation of MATH 573. It further develops knowledge of the theoretical basis of actuarial models and the application of those models to insurance and other financial risks.

MATH 576 Actuarial Modeling I (3.0)
Prerequisite: MATH 574.
Application of models presented in MATH 573-574. Development of business applications such as: Premium for life insurance and annuity contracts, Premium for accident and health insurance contracts, Premium for casualty or liability insurance contracts, Premium for property insurance contracts, Rates for coverage under group benefit plans, and Risk classification. This course, together with its continuation, MATH 577, covers the material on the Examination 4 of the Society of Actuaries and the Casualty Actuarial Society.

MATH 577 Actuarial Modeling II (3.0)
Prerequisites: MATH 576.
Further development of applications of key actuarial models.

MATH 578 Actuarial Valuation (3.0)
Prerequisites: MATH 577.
Valuation methods used in actuarial practice. Life insurance reserves, pension valuation, health insurance reserves, and property/casualty reserves are studied. Prospective, retrospective, and claim reserves are investigated. Covers the mathematical portion of the material on the Examination 5 of the Society of Actuaries.

MATH 580 Applied Graph Theory (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
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 (3.0)
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 (3.0)
Prerequisite: MATH 601
Elementary Halberd space theory, abstract measure spaces and integration, product spaces. Applications to other areas.

MATH 605 Functional Equations I (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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.

MATH 612 Complex Variables II (3.0)
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 (3.0)
Prerequisite: MATH 522.
Advanced theory of Groups, Rings, Integral Domains and Fields.

MATH 622 Algebra II (3.0)
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 (3.0)
Prerequisite: MATH 522.
Abstract Groups, Homomorphisms, Permutation Groups, Abelian Groups, Simple Groups, Sylow Theory, Series, Extensions.

MATH 633 Rings and Ideals (3.0)
Prerequisite: MATH 522.
Ideals and Homomorphisms, Prime Ideals and the Prime Radical, Rings of Endomorphisms, the Jacobson Radical.

MATH 641 Topology I (3.0)
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 (3.0)
Prerequisite: MATH 641
A continuation of MATH 641; introduction to algebraic topology, including the Fundamental Group and Covering Spaces.

MATH 660 Probability Theory (3.0)
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 (3.0)
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 (3.0)
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 667 Methods of Classification (3.0)
Prerequisites: MATH 561, 562.
Classification methods used in the industry to handle large databases.Logistic regression, structural equation modeling, multivariate analysis, data mining.

MATH 676 Actuarial Mathematics (4.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: MATH 683 or consent of department.
Advanced topics in discrete mathematics.

MATH 690 An Overview of Mathematics (3.0)
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 (3.0)

MATH 693 Seminar in Teaching Mathematics (1.0-3.0)
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 (1.0-6.0)

MATH 696 Computer in Teaching Science and Mathematics (3.0)
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 (1.0-12.0)

Microbiology & Immunology

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 Lab Rotations (1.0-2.0)
Research experience in didfferent faculty members' laboratories in areas of interest to the student. The purpose is to help the student select a Research Advisor. Acceptance by the faculty members is required. The course consists of one or two laboratory rotations (one rotation per quarter) with one credit hour per rotation. This course may be taken more than once if deemed necessary. Fall and spring semesters only. Pass/fail grading.

MBIO 601 Introductory Pathogenic Microbiology (3.0)
An introduction to the role of microorganisms in the pathogenesis of infectious diseases. The course will focus pirmarily on the major bacterial, fungal and viral pathogens. Lecture topics will include a detailed genetic, structural and metabolic examination of these bacteria, fungi, and viruses, including the role of identified virulence factors in the disease process. Most of the mjor infectious diseases will be discussed, in areas of transmission, disease progression, diagnosis, treatment, and prevention (ie...vaccines). Graded. Fall semester only.

MBIO 602 Introductory Immunology (2.0)
Prerequisites: BIOC 645 or permission of instructor.
An introduction to the immune system at cellular and molecular levels including: identification of cells of the immune system and their roles in the various immune responses, the role and mechanisms of intercellular communication in induction and regulation of immune responses, and mechanisms of gene rearrangement in the formation of the receptors of the immune system. The cellular and molecular mechanisms are presented in the contexts of the generation of acute inflammatory respones, antibody responses, cytotoxic responses, hypersensitivity reactions and autoimmunity.

MBIO 606 Seminar (1.0)
Prerequisite: Consent of instructor. Pass/Fail grading.

MBIO 618 Topics in Advanced Microbiology (1.0-3.0)
Prerequisites: Consent of instructor.

MBIO 619 Research (1.0-12.0)
Prerequisite: Consent of instructor. Pass/Fail grading.

MBIO 620 Thesis (1.0-6.0)
Prerequisite: Consent of instructor. Pass/Fail grading.

MBIO 631 Dental Microbiology And Immunology (5.0)
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. Graded Summer semester only.

MBIO 658 Cellular and Molecular Immunology (3.0)
Prerequisite: MBIO 602, 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. Graded. Alternate years, spring semester only.

MBIO 667 Cell Biology (3.0)
Prerequisites: One quarter of graduate level biochemistry or consent of instructor.
Note: Crosslisted with ASNB 667, BIOC 667, and BIOL 667.
An advanced treatment of contemporary cell biology including membrane structure and function, cytoskeleton, signal transduction, regulation of cell cycle, apoptosis, and the molecular mechanisms of cell differentiation.

MBIO 670 Molecular Virology (3.0)
Prerequisite: BIOC 645, 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. Graded. Alternative years, spring semester only.

MBIO 680 Microbial Genetics (3.0)
Prerequisites: MBIO 601, BIOC 645, 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. Graded. Alternative year, spring semester only.

MBIO 685 Microbial Physiology (3.0)
Prerequisite: BIOC 645, or consent of instructor.
Note: Crosslisted with BIOL 685.
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. Graded. Alternate years, fall semester only.

MBIO 687 Microbial athogenesis (3.0)
Prerequisite: MBIO 601, BIOC 645, 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. Graded. Alternate years, spring semester only.

MBIO 690 Research Methods in Microbiology and Immunology (3.0)
A series of lectures and laboratory demonstrations emphasizing current research techniques used in areas of immunology, virology, microbiology, biochemistry and molecular biology. A limited amount of hands-on experience may be utilized in some areas. Fall semester only. Pass/fail grading.

Mechanical Engineering

ME 510 Thermal Design of Internal Combustion Engines (3.0)
Prerequisite: Thermodynamics II (ME 310).
Thermodynamics and fluid mechanics of internal combustion engine design. Combustion stoichiometry, thermochemistry, and properties of working fluids. Ideal and real engine cycles. Fluid flow processes, combustion processes, pollutant formation and control. Engine operating characteristics.

ME 512 Finite Element Methods for Mechanical Design I (3.0)
Prerequisite: 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 thermal systems including conduction and convection.

ME 513 Energy Conversion (3.0)
Prerequisite: ME 310.
A study of nuclear and fossil-fueled steam generators, plus internal combustion prime movers and alternate energy sources. A computerized design project will be required.

ME 515 Mechanical Engineering Lab III (2.0)
Prerequisite: ME 415.
Continuation of ME 415. Specialized and advanced methods for the testing of mechanical systems. Emphasis is placed on dynamics, time varying signal generation, conditioning and analysis.

ME 520 Robotic Manipulator Design and Analysis (3.0)
Prerequisite: ME 410 or equivalent.
Review of kinematics, statics, and dynamics of mechanical linkages; design and analysis of mechanical structures, actuators, transmissions, and sensors. Control system design; trajectory control, force control, adaptive and optimal control. Emphasizes applications in manufacturing processes.

ME 521 Mechanical Vibrations (3.0)
Prerequisite: ME 435.
The theory of vibrating mechanical systems. Modeling of lumped parameter and distributed parameter systems. Free and forced vibration. Damping. Periodic and transient motion. Concept of normal modes. Multiple degree-of-freedom systems. Design applications.

ME 523 Intermediate Dynamics (3.0)
Prerequisite: ME 206 and 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 CAE software.

ME 525 Mechanical Design of Internal Combustion Engines (3.0)
Prerequisite: ME 310 and ME 422.
Design of internal combustion engine components and systems for strength, endurance, and optimum performance. Computer applications and open ended design projects.

ME 530 Advanced Mechanical Design (3.0)
Prerequisite: Graduate Professional or Graduate School standing and permission of graduate advisor.
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 (3.0)
Prerequisite: Graduate Professional or Graduate School standing and permission of Graduate advisor.
The 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 532 Experimental Stress Analysis (3.0)
Prerequisite: ME 314, ME 323 and ME 435.
Fundamentals of experimental stress analysis. Brittle coating methods, photoelastic coating and electrical strain gage techniques, strain measurements under static and dynamic loading.

ME 542 Gas Turbines (3.0)
Prerequisite: ME 310 and ME 401.
Theory and design of various types of gas turbine engines used for power and propulsion. Thermodynamic cycle analysis; design basics of turbomachinery, nozzles, diffusers and combustion chambers; engine performance analysis.

ME 545 Tribology (3.0)
Prerequisite: ME 401 and 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 (3.0)
Prerequisite: ME 440.
An introduction to the principles of direct energy conversion systems. Design and analysis of thermoelectric, photovoltaic, thermionic, magnetohydrodynamic power generators and fuel cells, and other modes of direct energy converters.

ME 560 Nuclear Engineering (3.0)
Prerequisite: ME 440 or 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 575 Special Topics in Mechanical Engineering (1.0-4.0)
Prerequisite: Faculty Consent.
A special topics course in mechanical engineering topics not covered by regularly scheduled courses.

ME 580 Air Pollution Control (3.0)
Prerequisite: CHEM 202, ME 310 or equivalent.
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 588 Independent Study in Mechanical Engineering (1.0-4.0)
Prerequisite: Faculty consent.
A theoretical or experimental investigation of a problem area related to mechanical engineering.

ME 612 Finite Element Methods for Mechanical Design II (3.0)
Prerequisite: ME 512.
Use of general purpose software for practical structural, thermal, and fluid design applications, including nonlinear and transient effects. Advanced modeling techniques, and analysis guideline with emphasis on interpretation of results.

ME 614 Heating, Ventilating, and Air Conditioning (3.0)
Prerequisite: 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. Automatic controls. Codes and standards. A design project will be required.

ME 616 Gas Dynamics (3.0)
Prerequisite: ME 401.
The thermodynamics of compressible-fluid flow. A detailed study of constant and varying area adiabatic flow, plane shock waves and losses, oblique shock waves and Prandtl-Meyer flow. Characteristics and design of efficient flow passages.

ME 618 Heat Exchanger Design (3.0)
Prerequisite: ME 401 and 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 (3.0)
Prerequisite: ME 432 or equivalent.
Cross-listed with CE 620.
Analysis of stress and strain. Topics include theories 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 (3.0)
Prerequisite: ME 435 and 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 (3.0)
Prerequisite: ME 620.
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 (3.0)
Prerequisite: 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 630 Turbomachinery (3.0)
Prerequisite: ME 310 and ME 401.
The thermodynamics and fluid mechanics of turbomachinery. Dimensional analysis and performance mapping. Preliminary design procedures. Blading and flow path design. Experimental and theoretical methods for determination of flow losses. Flow field calculations and performance prediction.

ME 635 Advanced Mechanical Engineering Analysis (3.0)
Prerequisite: Faculty consent.
Formulation of mathematical models for mechanical engineering problems, such as heat transfer, fluid mechanics, dynamics, etc., with special emphasis on computer solutions.

ME 636 Computer Simulation of Dynamic Systems (3.0)
Prerequisites: ME 380 and ME 435.
Modeling of systems comprised of mechanical, thermal, fluid, and electrical components. Use of general purposes computer simulation programs to implement the models and calculate system response to various inputs. Electromechanical components and their dynamic interaction. Optimization of overall system performance using parametric design studies.

ME 638 Computational Methods in Fluid Flow and Heat Transfer (3.0)
Prerequisite: Consent of instructor.
Solutions of the momentum and thermal boundary-layer equations; methods of solving boundary-value problems using digital computers. Finite-difference methods, finite-element methods, and other methods for solving equations of fluid flow and heat transfer. Turbulence models.

ME 640 Optimum Design Methods (3.0)
Prerequisite: ME 422 and consent of instructor.
Methods and applications of engineering design optimization. Strategies for problem formulation. Transformation methods, search techniques, linearization methods and quadratic approximation methods. Solution evaluation.

ME 641 Advanced Mechanics of Machinery (3.0)
Prerequisites: ME 442 and ME 521.
Machine analysis and design for high speed, high performance applications. Rigid-body kinematics and dynamics of mechanisms, balancing of machinery. Cam-follower mechanisms. Mathematical modeling of mechanisms composed of elastically deformable elements such as gears, bearings, linkages and acuators. Transient and steady-state dynamic response. Failure modes and prevention. A design project is required.

ME 642 Design of Fluid Power Systems (3.0)
Prerequisites: ME 380, ME 401, and ME 435.
Design methodology for hydraulic and pneumatic fluid power systems. Study of the operating principles of pumps, hydraulic motors, compressors, blowers, fans, actuators, accumulators, and control components, with an emphasis on dynamic analysis and computer simulation. Fluid logic control systems. Applied design projects are required.

ME 643 Rapid Product Development (3.0)
Prerequisites: ME 380 and ME 422.
Rapid design and prototyping using engineering workstations, CAD/CAM software, and various rapid prototyping processes, including table-top CNC machining, selective laser sintering, laminated object manufacturing, injection molding, fused desposition modeling, and stereolithography. A design project leading to a functional prototype is required.

ME 644 Mechatronics (3.0)
Prerequisites: ME 435 and ECE 535.
Introduction to multi-domain systems. Mechanical, thermal, fluid, electrical, electronic, electromechanical system dynamics. Emphasis on modeling and simulation of hybrid systems using modern computer-aided tools.

ME 645 Mechanical Engineering Structured Research Project (3.0)
Prerequisite: Graduate/Professional school standing.
Corequisite: ME 677.
Structured research in a mechanical engineering discipline. A proposal, activity reports and final report are required. Research results are presented for faculty and peer review, and must also be documented in a scholarly paper targeted toward a journal or technical conference. Intended for candidates for the Master of Engineering degree choosing the non-thesis curriculum alternative.

ME 646 Design for Manufacturability and Reliability (3.0)
Prerequisites: ME 442 and IE 360.
Introduction to manufacturing concerns such as efficient assembly, producibility, and quality that should be considered early in the design process. Topics include the product development cycle, manufacturing process selection, tolerancing, design for assembly, quality control techniques, Taguchi's robust design methodology, quality function deployment, value engineering and reliability-based design. Life cycle optimization.

ME 647 Advanced Design Methods (3.0)
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 651 Kinematics and Kinetics of Human Movement (3.0)
Prerequisite: ME 206.
Development of analytical tools for evaluating three-dimensional kinematics and kinetics of human motion.

ME 652 Advanced Human Biodynamics (3.0)
Prerequisites: ME 651.
Development of techniques for synthesis and analysis of kinematic and kinetic models of human motion, in conjunction with acquisition of biomechanical data associated with functional human movement.

ME 653 Mechanics of Biomaterials (3.0)
Prerequisites: ME 323 and CHEM 202.
Presentation of fundamental mechanics of biomaterials including: natural biomaterials (skin, bone, cartilage, ligament, tendon, and vasculature) and synthetic materials (metals, ceramics, polymers, and composites) used in biological applications; biocompatability and biological reactions to implanted materials.

ME 654 Advanced Hard and Soft Tissue Mechanics (3.0)
Prerequisites: ME 653.
Presentation of current knowledge and theory pertaining to biological hard and soft tissue with discussion of issues such as tissue formation, growth, damage, and healing, as well as surgical intervention.

ME 655 Biomedical Acoustics (3.0)
Prerequisites: ME 380 or equivalent; ME 435 or ME 521; and BSC 211 and BSC 212, or equivalent.
An introduction to the principles and technology involved in the application acoustic waves to therapeutic and non-therapeutic biomedical applications. Topics include acoustic sources, sonic waveguides, sound radiation, room acoustics, sound measurement, digital audio, biomedical applications, and sound reinforcement applications.
Review of current research topics in electro- and biomedical acoustics.

ME 656 Orthopedic Bioengineering (3.0)
Prerequisites: Anatomy and Physiology (BSC 211 and BSC 212, or equivalent).
An overview of the fundamentals of bone and joint form, function, pathology, and mechanical considerations. Based on optimum performance, implant design characteristics and pitfalls will be discussed. Special attention will be placed on design issues relating to natural human biomechanical, healing, and adaptive behavior.

ME 657 Computational Biomechanics (3.0)
Prerequisites: BSC 211 and BSC 212, or equivalent and ME 654.
Emphasizes the use of computers in the modeling and analysis of biomechanical structures. Topics include medical imaging, finite element modeling and analysis, kinematic analyses, and computer-aided surgery.

ME 658 Dental Biomechanics (3.0)
Prerequisites: BSC 211 and BSC 212, or equivalent and ME 654.
A study of the biomechanical principles appliciable to dentistry and orthodontics with emphasis on computer modeling. Topics include: mechanics of chewing, basic force systems involved appliance design for tooth movement, dental implants, and surgical treatment of patients with dentofacial anomalies.

ME 659 Micro Pressure and Flow Sensors for Biomedical Applications (3.0)
Prerequisites: Graduate/professional standing.
Application of microtechnologies to the development of practical pressure and flow sensors for biomedical applications. Overview of micro-fabrication processes and conventional flow/pressure sensing devices. Application specific criteria supporting the need for miniaturization. Design principles and constraints. Students are required to design either a micro flow or pressure sensor for a specific biomedical application.

ME 661 Advanced Thermodynamics (3.0)
Prerequisite: Faculty consent.
Review of thermodynamic fundamentals, with application to selected topics. Irreversible, non-equilibrium thermodynamics.

ME 663 Heat Conduction (3.0)
Prerequisite: ME 440.
Derivation of governing equations. Classical heat conduction solutions with various boundary conditions. Computer applications.

ME 664 Heat Convection (3.0)
Prerequisite: 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 (3.0)
Prerequisite: 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 (3.0)
Prerequisite: ME 521.
Analytical and computational methods for mechanical vibration problems. Formulation and solution techniques. Modeling and applications.

ME 669 Advanced Dynamics (3.0)
Prerequisite: Faculty consent.
Kinematics and dynamics of rigid-body motion. An introduction to variational mechanics, including generalized coordinates and Lagrange's equations of motion. Stability of motion, including the Routh-Hurwitz criterion and the Liapounov direct method.

ME 671 Advanced Fluid Mechanics (3.0)
Prerequisite: 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 (3.0)
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 (1.0-6.0)
Prerequisite: Faculty consent.
An advanced course in mechanical engineering topics not covered by regularly scheduled courses.

ME 677 Mechanical Engineering Comprehensive Exam (0.0)
Prerequisite: Graduate/professional school standing.
Corequisite: ME 645.
A comprehensive examination required of all candidates for the Master of Engineering degree choosing the non-thesis curriculum alternative.

ME 688 Independent Study in Mechanical Engineering (1.0-6.0)

ME 690 M.S. Thesis in Mechanical Engineering (1.0-6.0)
Experimental and/or theoretical thesis research to be presented in thesis for degree requirement.

ME 694 Mechanical Engineering Seminar (1.0-3.0)
Prerequisites: Graduate/professional school standing.
Presentations on research projects and current literature in the field of mechanical engineering. Attendance, but not necessarily course registration is required of all mechanical engineering graduate students during each semester of residence. Only 3 hours of credit may be accumulated.

ME 697 Master of Engineering Thesis in Mechanical Engineering (1.0-8.0)
Prerequisite: Graduate/professional school standing.
Original design or research activity in a mechanical engineering discipline, under the direction of a faculty member. A written thesis must be presented to a faculty committee and defended. Intended for candidates for the Master of Engineering degree choosing the thesis curriculum alternative.

ME 700 Dissertation Research in Mechanical Engineering (1.0-18.0)
Prerequisites: Completion of doctoral program core and permission of dissertation director.
Original research activity in an appropriate mechanical engineering discipline, under the direction of a Mechanical Engineering graduate faculty member.

Master of Engineering Residency

MENG 600 Master of Engineering Residency (0.0)

Management

MGMT 501 Managerial Statistics (3.0)
Prerequisites: Intermediate Algebra; fulfills a Foundation requirement only.
Note: Crosslisted with PADM 501.
A survey of statistics, regression, ANOVA, and forecasting.

MGMT 600 Advanced Organizational Behavior (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 650 Organizational Structure and Design (3.0)
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 (3.0)
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 (1.0-6.0)
An advanced study of one or more selected topics or issues related to the study of Management.

MGMT 684 Managing Creativity and Innovation (3.0)
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 (3.0)
Prerequisites: Concurrent with MGMT 686.
Study of the activities associated with the creation, assessment, development, and peration 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 (3.0)
Prerequisite: Concurrent with MGMT 685.
Development of a complete business plan for the creation of a new venture.

MGMT 687 New Venture Finance (3.0)
Prerequisite: MGMT 685.
Organization and presentation of financing plans for new ventures; securing financial support.

MGMT 689 New Venture Implementation (6.0)
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 (3.0)

MGMT 698 Research Seminar in Management (1.0-3.0)
Prerequisite: One 600-level management course and permission of departmental chair.

Marketing

MKT 500 Marketing Concepts (1.5)
Note: Fulfills a Foundation 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 (3.0)
Prerequisites: MKT 500, CIS 675, ECON 600, MGMT 600.
An integrated managerial approach to the study of modern marketing theory, analysis, and strategic decision-making in the context of the firm. Topics include the marketing mix, global opportunities, ethical implications, E-commerce, social forces, legal issues, and electronic communication networks.

MKT 610 Consumer Behavior (3.0)
Prerequisites: MKT 600.
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 612 Supply Chain Management (3.0)
Prerequisites: MKT 500.
Examines the integration of business processes from end users to original suppliers. E-logistics and purchasing issues are discussed along with the integration of information and product/service flows that add value to customers.

MKT 620 Marketing Research (3.0)
Prerequisites: MKT 600.
An application of qualitative and quantitative information relevant to marketing decisions in the organization. Topics include: research design, collection of primary and secondary data, using statistical packages, and employing scanner data and web based techniques for meeting marketing information needs.

MKT 630 Sales Management (3.0)
Prerequisites: MKT 600.
A managerial decision approach involving sales planning, and sales operations in the contemporary context of rapid digital communication wthin the supply chain. Topics include territory management, sales forecasting, relationship building, motivation, recruitment, compensation, and ethical issues.

MKT 670 Global Marketing (3.0)
Prerequisites: MKT 600.
A managerial approach that centers on the needs of contemporary organizations to identify, understand, and serve global markets. Topics include global research, cultural environments, global sourcing, world customers, pricing, competition, and the evolving political, legal, technological, and social environments of world trade.

MKT 680 Special Topics in Marketing (1.0-3.0)
An advanced study of one or more selected topics or issues related to the study of Marketing.

MKT 698 Research Seminar in Marketing (1.0-3.0)
Prerequisite: One 600-level marketing course and permission of departmental chair.

Music Education

MUED 605 Pre-Student Teaching: Orientation and General Methods (Vocal) (3.0)
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) (3.0)
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 (2.0)
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 (2.0)
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 (3.0)
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 (4.0)
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 (4.0)
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 (2.0)
Study of major research projects in music education.

MUED 629 Music Education I (2.0)
Philosophy and psychology of school music teaching; survey of music education literature.

MUED 630 Music Education II (2.0)
Problems in supervision, curriculum construction, and administration.

MUED 639 Gordon Music Learning Theory (2.0)
An introduction to the terminology and practical applications of Edwin Gordon's music learning theory.

Music

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 (0.0)
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 Major Instrument (2.0)

MUS 502 Major Instrument (2.0)
Refer to: MUS 501

MUS 503 Major Instrument (4.0)

MUS 504 Major Instrument (4.0)
Refer to: MUS 503

MUS 509 Major Ensembles (1.0)
Open to all qualified students after consultation with the director. Symphony Orchestra; Symphonic Band; Early Music Ensemble; Opera Theater; Jazz Band; Concert Band; Pep Band; Wind Ensemble; Wind Symphony, New Music Ensemble; Marching Band; University Chorus; Collegiate Chorale.

MUS 511 Principal Instrument (2.0)

MUS 512 Principal Instrument (2.0)

MUS 513 Principal Instrument (4.0)

MUS 514 Principal Instrument (4.0)

MUS 519 Minor Ensembles (0.5)
Open to all qualified students after consultation with the director. Piano; String; Woodwind; Brass or Percussion; Ensemble; Improvisation; Guitar; Jazz Combo (Instrumental); Vocal Jazz Ensemble; Jazz Ensemble; Brass Quintet Trumpet, Trombone, Tuba or Tuba/Euphonium; Saxophone Ensemble; Opera Workshop; Clarinet, Flute, Harp Ensemble; Community Band; Historical Instruments.

MUS 521 Secondary Instrument (1.0)

MUS 522 Secondary Instrument (1.0)

MUS 527 Choral Music in the Modern Secondary School (2.0)
Procedures and techniques for use with the High School Chorus including such topics as selection of repertoire, voice production, diction, rehearsal psychology, and performance practice.

MUS 529 Honors Ensembles (0.0)
University Singers. Admission by audition only.

MUS 533 Functional Study (1.0)

MUS 534 Functional Study (1.0)

MUS 535 Music Industry I (2.0)
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 (2.0)
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 (2.0)
Problems in preparing the half-time show. Arranging for the marching band.

MUS 539 Studies in Jazz (2.0)
Studies of selected topics relating to the development of Jazz.

MUS 543 Advanced Composition (2.0)

MUS 544 Advanced Composition (2.0)
Refer to: MUS 543

MUS 545 Advanced Orchestration (2.0)

MUS 546 Advanced Orchestration (2.0)
Refer to: MUS 545

MUS 547 Chromatic Harmony and Analysis (2.0)
2 lecture, 1 lab.
Prerequisites: Music 242, Music 347.
A study of chromatic harmony and voice leading, expanded tonality, and extended forms. Analysis of music of the late 19th and early 20th century: creative writing in styles of this period.

MUS 548 Analysis of Twentieth Century Music (2.0)
2 lecture, 1 lab.
Prerequisites: MUS 242, MUS 547.
Survey of 20th century analytic techniques. Analysis of atonal, serial, centric, and post-serial compositions.

MUS 549 Counterpoint I (2.0)
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 (2.0)
Prerequisite: MUS 549.
A study of eighteenth-century counterpoint, emphasizing Bach\'s style and leading to chromatic writing of the late nineteenth century.

MUS 552 Foundations of Music Theory (3.0)
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 (2.0)
Prerequisite: Consent of instructor.
Fundamentals of MIDI, electronic keyboards, sound modules and ancillary components of computer-assisted music production.

MUS 554 Computers & Music II (2.0)
Prerequisite: MUS 553.
Advanced sequencer and notation software techniques, MIDI applications in audio engineering, machine control and related devices.

MUS 555 Instrument Repair (2.0)
Repair of woodwind and brass instruments.

MUS 557 Piano Technology (2.0)
Basics of tuning, elementary repair, and maintenance.

MUS 558 Piano Technology (2.0)
Refer to: MUS 557

MUS 559 Instrumental Conducting and Score Reading (2.0)
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 (2.0)
Prerequisite: Choral conducting technique.
Conducting for the public school choral director. Survey of usable literature.

MUS 561 Literature (2.0)
A survey of standard piano repertory of Hayden to the present day.

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 562 Literature (2.0)
Refer to: MUS 561

MUS 563 Literature (1.0)
Performance literature for orchestral instruments.

MUS 564 Literature (1.0)
Refer to: MUS 563

MUS 565 Church Music Literature (2.0)
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 566 Church Music Literature (2.0)
Refer to: MUS 565

MUS 570 Studies in Music History (3.0)
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 Pedagogy (2.0)
Examination, evaluation, and discussion of piano teaching materials at all levels.

MUS 572 Pedagogy (2.0)
Refer to: MUS 571

MUS 573 Piano Pedagogy Practicum (2.0)
Prerequisites: MUS 372.
Supervised practice teaching of a beginning piano student. Observation of lessons given by class members. Discussions on teaching problems.

MUS 574 Piano Pedagogy Practicum (2.0)
Refer to: MUS 573

MUS 580 Seminars in the Music of the Great Composers (3.0)
Prerequisite: See note following course MUS 570.
The seminar may be repeated under different subtitles.

MUS 582 Seminar in Historical Performance Practice (3.0)
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 (3.0)
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 (3.0)
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 (0.5-3.0)
This course may be repeated, but no more than 6 semester hours may be counted toward an advanced degree.

MUS 591 Special Topics (1.0-3.0)
Prerequisites: Permission of instructor.
One or more advanced topics not treated comprehensively in regular course offerings.

MUS 597 Recital (0.0)
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 Applied Music (2.0)

MUS 602 Applied Music (2.0)
Refer to: MUS 601

MUS 603 Applied Music (4.0)
Courses MUS 601-604 open only to music majors for work and study on the student's major or principal instrument.

MUS 604 Applied Music (4.0)
Refer to: MUS 603

MUS 605 Jazz Applied (2.0)
Prerequisites: Admission to MM Degree in Jazz.
Applied Instrumental study for jazz students.

MUS 606 Jazz Applied (2.0)
Prerequisites: MUS 605.
Applied instrumental study for jazz students.

MUS 607 Bibliography and Research Methods (3.0)

MUS 611 Applied Music (2.0)

MUS 612 Applied Music (2.0)
Refer to: MUS 611

MUS 613 Applied Music (4.0)
Courses MUS 611-614 open only to music majors for work and study on the student\'s major or principal instrument.

MUS 614 Applied Music (4.0)
Refer to: MUS 613

MUS 615 Jazz Applied (2.0)
Prerequisites: MUS 605, MUS 606.
Applied instrumental study for jazz students.

MUS 616 Jazz Applied (2.0)
Prerequisites: MUS 605,606, 615.
Applied instrumental study for jazz students.

MUS 621 Applied Music (1.0)

MUS 622 Applied Music (1.0)
Refer to: MUS 621

MUS 623 Applied Music (4.0)
Courses MUS 621-624 open only to music majors for work and study on the student's major or principal instrument.

MUS 624 Applied Music (4.0)
Refer to: MUS 623

MUS 627 Advanced Elementary Music Methods (2.0)

MUS 628 Case Studies in Music Education (2.0)
A study of major research projects in music education.

MUS 631 Advanced Methods of Teaching Brass Instruments (2.0)
Problems in teaching brass instruments in the public schools. Research in methods and materials.

MUS 633 Advanced Methods of Teaching Woodwind Instruments (2.0)

MUS 637 Advanced Secondary Music Methods (2.0)

MUS 638 Organization and Administration of Instrumental Groups (2.0)
Organizing, financing, and promoting the instrumental program.

MUS 639 Gordon Music Learning Theory (2.0)

MUS 641 Pedagogy of Theory I (2.0)
An analysis and discussion of the various methods of teaching the elements of music theory, including a survey of available textbooks and supplementary materials.

MUS 642 Pedagogy of Theory II (2.0)
Refer to: MUS 641

MUS 643 Advanced Private Instruction in Composition and Orchestration (2.0)

MUS 644 Advanced Composition and Orchestration II (2.0)

MUS 645 Advanced Composition and Orchestration III (2.0)

MUS 646 Advanced Private Instruction in Composition and Orchestration (2.0)
Refer to: MUS 643

MUS 647 Advanced Chromatic Harmony and Analysis (3.0)
Prerequisites: Graduate standing.
Chromatic harmony and voice leading in the context of expanded tonality and extended tonal forms; analytical approaches to the music of the late 19th and early 20th century.

MUS 648 Advanced Analysis of Twentieth Century Music (3.0)
Prerequisites: Graduate standing.
Analytical approaches to the organization of pitch, rhythum, form, and other elements in the atonal serial, centric, and post-serial music of the twentieth century.

MUS 649 Advanced Counterpoint I (2.0)
Prerequisite: MUS 550.
A continuation of the prerequisite counterpoint courses but for the advanced student in the field.

MUS 650 Advanced Counterpoint II (2.0)
Refer to: MUS 649

MUS 651 Schenkerian Analysis (3.0)
Prerequisite: Graduate standing.
The graphic analytic techniques developed by Heinrich Schenker and the theoretical constructs on which they are based.

MUS 653 Advanced Analysis (3.0)

Prerequisites: Graduate standing.

Development of the aural and visual comprehension of the elements contributing to style and cohesion in music. May cover diverse historical periods of focus on one period.I

MUS 655 Advanced Jazz Improvisation (2.0)
1 lecture, 1 lab.
Prerequisites: Completion of Jazz Theory, Improvisation (138) and at least 4 semesters of Combo or 4 semesters of Jazz Ensemble, or permission of instructor.
Understanding jazz improvisation through the study of harmony, theory, improvisation, ear training, transcibed solos, articulation, the various song forms/types, basic piano comping and melodic composition.

MUS 656 Advanced Jazz Arranging (2.0)
Prerequisites: Jazz Arranging I and II (MUS 435 and 436) or permission of instructor.
Focus on linear approaches to jazz ensemble arranging and orchestration, idiomatic counterpoint, non vertical systems and advanced harmonic substitution. Includes study of non-traditional instrumentation, hybrid ensembles, contemporary big band, and traditional styles and forms.

MUS 657 Film/TV Scoring (2.0)
Prerequisites: MUS 435-436 or permission of instructor.
Overview of film scoring techniques from inception of the art to the present. May also explore contemporary media (internet, video games).

MUS 659 Seminar in Conducting I (2.0)
Advanced conducting techniques as they apply to choral and instrumental ensembles. Literature to be studied drawn from masterworks of every age.

MUS 660 Seminar in Conducting II (2.0)
Refer to: MUS 659

MUS 670 Studies in Music History (3.0)
Areas of study are Medieval Music, Renaissance Music, Baroque Music, Viennese Classicism, Romantic Music, Twentieth-Century Music.

MUS 671 Advanced Piano: Pedagogy I (2.0)
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 672 Advanced Piano: Pedagogy II (2.0)
Refer to: MUS 671

MUS 675 Master's Practice in Collegiate Teaching (1.0)
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 676 Master's Practice in Collegiate Teaching (1.0)
Refer to: MUS 675

MUS 680 Seminars in the Music of Great Composers (3.0)
Note: This course may be repeated under different subtitles.

MUS 682 Seminar in Musicology (3.0)

MUS 690 Independent Study (0.5-3.0)
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 (1.0-3.0)

MUS 694 Research (1.0-3.0)
Subtitles may accompany the course title to indicate the area of research.

MUS 695 Thesis Guidance (2.0-4.0)
Prerequisite: Master's candidates in music education, music theory-composition, and music history.

MUS 697 Graduate Recital (0.0)
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 698 Professional Paper (0.0)
Prerequisites: For Masters of Music Education students only.
Culmination of music education research project. Journal-length scholarly work of publishable quality and length using primary and secondary sources.

Music Education (MUSE)

Note: *Not open to music majors.*

MUSE 525 Public School Music (3.0)
Undergraduate or graduate credit.
Music fundamentals for the classroom teacher. Work based upon the processes of Carl Orff and Zoltan Kodaly. A laboratory setting of approximately 60 hours of class time.

MUSE 590 Independent Study (1.0-3.0)

Nursing

NURS 550 Foundations for Advanced Practice (3.0)
Focus is on the analysis and application of selected nursing and family theories for advanced practice. Fall.

NURS 552 Health Care Systems (3.0)
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 (4.0-13.0)
Prerequisite: NURS 550, NURS 655, NURS 656, NURS 658, and PHTX 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 (6.0-13.0)
Prerequisite: NURS 550, NURS 655, NURS 656, NURS 658 and PHTX 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 (4.0-13.0)
Prerequisite: NURS 550, NURS 655, NURS 656, NURS 658, and PHTX 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 Advanced Health Assessment of the Neonate (3.0)
An in-depth study of neonatal assessment techniques and normal versus abnormal variations seen in the newborn. Emphasis is on the clinical presentation of the newborn utilizing concepts from developmental anatomy and physiology as well as intrauterine factors that may alter development.

NURS 635 Advanced Clinical Practice: Neonatal NP (3.0-4.0)
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 12 credits in this course to graduate.

NURS 636 High- Risk Clinical: Neonatal NP (2.0-8.0)
Prerequisites: NURS 629; NURS 635-51.
Clinical course that allows the neonatal nurse practioner the opportunity to apply theoretical knowledge to the care of the neonate in multiple settings, but particularly in the Level III NICU. Emphasis will be on the transfer of theoretical knowledgeand the individualization of patient care. Family dynamics will be assessed and are considered integral to the management plan. The student will be expected to demonstrate leadership behaviors in the clinical setting.

NURS 645 Advanced Clinical Practice: Adult Psychiatric-Mental Health CNS (6.0-13.0)
Prerequisite: NURS 647, NURS 649, PHTX 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 (3.0)
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 649 Clinical Psychopharmacology (1.0)
Prerequisites or **Corequisites**: 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 (4.0)
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 (3.0)
Prerequisite: Consent of instructor.
Applied descriptive and inferential statistics using computer software.

NURS 653 Advanced Practice Roles (3.0)
Focuses on the advance practice roles of educator, consultant, researcher, leader and expert practitioner.

NURS 654 Informatics in Health Care (2.0)
Focus on how nurses use technology to manage data, information and knowledge. Fall.

NURS 655 Pathophysiology: Clinical Decision Making (3.0)
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 (3.0)
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 (3.0)
A survey of preventive and maintenance non-pharmacologic interventions for health care personnel to use with individuals and families. Spring.

NURS 660 Advanced Clinical Practice: Family Nurse Practitioner Seminar I (1.0)
Prerequisites or **Corequisites:** NURS 550, NURS 655, NURS 656, PHTX 650.
This course is a bridge course for Advanced Family Practice Nursing. Students will critically examine the philosophy and scope and standards of Advanced Family Practice Nursing and complete a family community assessment. Selected theory related to individual learning needs including childbearing families will be included

NURS 661 Advanced Clinical Practice: Family Nurse Practitioner Clinical I (3.0)
Prerequisites or **Corequisites** for Generic Students:NURS 660, NURS 725 (UK College of Nursing).
Prerequisites or **Corequisites** for Post MSN ANP Students: NURS 660, NURS 664.
This clinical course places an emphasis on the role of the advanced practice nurse as a member of the health care team across a variety of settings. The clinical experience focuses on comprehensive patient assessment, diagnosis and management of acute health problems for individuals and their families.

NURS 662 Advanced Clinical Practice: Family Nurse Practitioner Clinical II (2.0)
Prerequisites or **Corequisites** for Generic Students: NURS 661, NURS 726 (UK College of Nursing).
Prerequisites or **Corequisites** for Post MSN ANP students: NURS 661, NURS 664.
This clinical places an emphasis on the role of the advanced practice nurse as a member of the health care team across a variety of settings. The clinical experience focuses on comprehensive patient assessment, diagnosis and management of chronic health problems for individuals and their families.

NURS 663 Advanced Clinical Practice: Family Nurse Practitioner Internship (6.0)
Prerequisites or **Corequisites** for Generic Students: NURS 662, NURS 726 (UK College of Nursing).
This clinical experience focuses on synthesis of theoretical, scientific, and clinical knowledge as well as practice-based skills in the diagnosis and management of existing and potential health problems based on appropriate standards of care. Emphasis will be placed on the collaborative and leadership roles of the advanced practice nurse in health care delivery.

NURS 664 Common Health Problems of the Pediatric and Adolescent Client (2.0)
Prerequisites or **Corequisites** for Generic Students: NURS 662, NURS 726 (UK College of Nursing).
Prerequisites or **Corequisites** for Post MSN ANP students: NURS 660.
Focus is on the Family Nurse Practitioner's role in the identification and management of selected acute, chronic, and emergent health problems of the pediatric and adolescent client. Emphasis is on the role of the Family Nurse Practitioner as a collaborative member of the health team as a supportive resource for parents.

NURS 665 Advanced Clinical Practice: Gerontology (4.0-13.0)
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 690 Special Topics (1.0-6.0)
Prerequisite: Consent of instructor.
Selected topics in nursing and health care. Semester topic will be indicated in Schedule of Courses.

NURS 696 Independent Study (1.0-3.0)
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 (2.0-3.0)
Prerequisite: NURS 651.
Provides the student an opportunity to develop, implement and present results of a research study of limited scope.

NURS 699 Thesis (1.0-6.0)
Prerequisite: NURS 651.

Oral Biology

OBIO 501 Biomedical Data Analysis: Experimental Design and Statistics (3.0)
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 (4.0)
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 (2.0)
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 (3.0)
Prerequisite: Consent of instructor.
Contemporary concepts and literature in bone and calcium physiology. Lectures and student-led discussions.

OBIO 604 Oral Microbiology (3.0)
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 (1.0)
Prerequisites: OBIO 601: Introduction to Oral Biology Research.

OBIO 610 Advanced Topics in Oral Biology (1.0-4.0)
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 611 Craniofacial Osteology (1.0-3.0)
Prerequisites: OPGD 80104 and OPGD 80506 or equivalents.
Explores the hard tissue interrelationships of the cranifacial complex. Includes the mechanical properties, origins and maturation of facial bones. Complements the cephalometric course; designed to link clinical applications to anatomic locations.

OBIO 612 Craniomaxillofacial Diagnostic Imaging (2.0-4.0)
2 lecture, 2-4 lab.
Prerequisites: One of the following: 1 Admission to the Graduate School for studies in Oral Biology; 2 a DMS/DDS degree or its foreign equivalent; 3 a MD/DO degree or its foreign equivalent.
To teach principles of safety, quality assurance, selection criteria and interpretation for current diagnostic imaging modalities of interest to the health care provider treating the craniomaxillofacial complex.

OBIO 613 The Diagnosis & Treatment of Temporomandibular Disorders (1.0)
Prerequisites: D.M.D. or D.S.D. degree or instructor approval.
Will present the basic concepts of Temporomandibular Disorders. Emphasis is on Etiology, Examination, Recognition, Diagnosis and Treatment of Facial Pain/TMJ Disorders and Occlusal Abnormalities.

OBIO 614 Advanced Oral Diagnosis and Oral Medicine (1.0)
Prerequisites: One of the following: Admission to the M.S. Oral Biology program; a DDS or DMD degree or its foreign equivalent; consent of the instructor.
Will present advanced topics on diagnostic methods and therapy relative to oral-maxillofacial and systematic diseases, and the inter-relationships between oral and systemic disease.

OBIO 615 Advanced Clinical Pharmacology (1.0)
Prerequisites: One of the following: Admission to the M.S. Oral Biology program; a DDS or DMD degree or its foreign equivalent; consent of the instructor.
To present advanced topics in clinicalpharmaacology with specific emphasis on antibiotics, analgesics, local anesthetics, anxiolytic, antifungal and antiviral drugs.

OBIO 616 Overview of Medical Genetics in Ora-Facial Disease (1.5)
Prerequisites: One of the following: Admission to the M.S. Oral Biology program; a DDS, DMD or MD degree or its foreign equivalent; consent of the instructor.
The stdent will study the medical genetic influence on development and growth as well as dysmorphology and disease, of the human body. Risk factors, probabilities and clinical outcomes are emphasized.

OBIO 617 Advanced Oral Pathology (1.0)
Prerequisites: One of the following: Admission to the M.S. Oral Biology program; a DDS, DMD, or MD degree or ots foreign equivalent; consent of the instructor.
Introduction to the clinical and radiographic manifestations of diseases of the oral cavity and para-oral region. Also included will be the clinical differential diagnosis oral lesions and the etiology and histology of common oral lesions. Clinical evaluation and management of oral lesions will be discussed as well.

OBIO 619 Research (1.0-8.0)
Taught on Pass/Fail basis.

OBIO 620 Thesis (1.0-8.0)
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 (5.0)
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.

Public Administration

PADM 600 Public Administration and Organizational Theory (3.0)
Note: Crosslisted with POLS 625, PLAN 613, & UPA 661.
Basic principles of public administration with analysis of problems of bureaucracy, organization, financial management and public policy.

PADM 601 Statistics for Public Affairs (3.0)
2 lecture, 1 lab.
Note: Crosslisted with PLAN 602.
Covers descriptive statistics, probability, sampling, tests of significance, correlation, regression analysis, and the use of statistical software packages.

PADM 602 Applied Research Methods (3.0)
Note: Crosslisted with PLAN 604.
Provides students with the basic analytical tools commonly used by professional planners and public administrators. The use of computers in applying these tools will be emphasized.

PADM 603 Policy Analysis and Program Evaluation (3.0)
Note: Crosslisted with UPA 621.
The course describes techniques of practical program evaluation as well as institutional context of policy formulation, adoption, implementation, and evaluation. Process evaluation, qualitative approaches, outcome monitoring, natural experiments, quasi-experiments, ratings, use of expert judgment, surveys, role-playing, and focus group topics are covered. The course also describes theories of policy making, the policy environment, agenda setting and decision making.

PADM 604 Public Budgeting and Finance (3.0)
Note: Crosslisted with UPA 647 and PLAN 609.
Examines public budgeting and finance from economics, 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 (3.0)
Note: Crosslisted with UPA 672 & PLAN 610.
Administration of the organization from the point of view of management. Formulation and administration of policies and practices. Developmentof long range strategic plans as well as the diagnosis, analysis, and evaluation of specific organizational problems.

PADM 606 Public Policy (3.0)
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 Planning Theory (3.0)
Note: Crosslisted with UPA 684 and PLAN 601.
In-depth examination of urban and regional planning theory, with special focus on the rational comprehensive model.

PADM 610 Administrative Law and Process (3.0)
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 (3.0)
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 (3.0)
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 621 The Politics of Urban Development (3.0)
Crosslisted with UPA 651.
The role of political processes in the formulation and implementation of urban development policy; federal regulations and development; community competition and conflict.

PADM 622 Urban Design (3.0)
2 lecture, 1 field work.
Note: Crosslisted with PLAN 622 & UPA 682.
Covers theories principles, and processes of urban design, including applications to actual design problems.

PADM 623 Comparative Urban Development (3.0)
Note: Crosslisted with UPA 623.
Examines Urban development in a cross national perspective. Traces the formulation, strategy and implementation or management of urban development policy in a number of nations. While the emphasis is on North America and West Europe, the lessons have broader relevance for other parts of the world, and will be applied to developing areas.

PADM 624 Ethics in Public Administration (3.0)
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 625 Advanced Organizational Behavior (3.0)
Crosslisted with UPA 660.
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.

PADM 626 Community Housing Policies (3.0)
Housing problems; housing policy and programs; and analytical procedures used in housing development planning.

PADM 627 Environmental Policy (3.0)
Note: Crosslisted with PLAN 620, UPA 679.
Survey of environmental issues and policies designed to address these issues.

PADM 628 Historic Preservation (3.0)
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 (3.0-0.0)
Analytical methods used by transportation planners; development of transportation plans, policies, and programs.

PADM 630 Environmental Policy and Natural Hazards (3.0)
Note: Crosslisted with PLAN 623 and UPA 687.
Explores the relationship of environmental policy and planning with natural hazards and disasters, with an emphasis on preparation for and mitigation of impacts.

PADM 632 Topics in Urban & Regional Development (3.0)
Selected issues and problems of urban development. Specific subject matter will be announced in the schedule of courses each semester.

PADM 640 Urban Economics (3.0)
Prerequisites: PLAN 500, ECON 500, or consent of instructor.
Note: Crosslisted with ECON 605, UPA 603 & PLAN 603.
Application of economic theory to urban policy issues including metropolitan development and job creation, poverty, crime, transportation, environment, spatial structure, and other issues.

PADM 642 Human Resources Management (3.0)
Note: Crosslisted with UPA 667 & PLAN 611.
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 (3.0)
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 Economic Development (3.0)
Note: Crosslisted with UPA 640.
The use and application of static and dynamic models for urban community development. Includes economic base industry and firm location models, and community growth.Topics include transportation, energy, pollution, income distribution, and employment.

PADM 647 Arbitration (3.0)
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 (3.0)
Note: Crosslisted with PLAN 612.
Designed principally for incipient practioners of the mediation process. Class participation, serving as a mediator in cases presented to the class, and a short paper depicting mediating in process are the course requirements.

PADM 649 Legal Aspects of Labor Relations (3.0)
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 (3.0)
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 (3.0)
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 654 Special Topics in Worker-Management Relations (3.0)
Prerequisite: Consent of instructor.
Selected issues within the general area of worker-management relations.

PADM 671 Special Topics in Public Policy Analysis (3.0)
Selected issue(s) in the general area of public policy analysis.

PADM 680 Independent Research in Public Administration (1.0-3.0)
Prerequisite: Permission of coordinator.

PADM 681 Independent Readings in Public Administration (1.0-3.0)
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 (1.0-6.0)
Prerequisite: Permission of internship-practicum coordinator.

PADM 683 Topical Seminar in Public Administration (1.0-3.0)
Prerequisite: Permission of instructor.
Exploration of a specific topic or problem area in administration.

PADM 684 Advanced Research Methods (3.0)
Prerequisite: Permission of instructor.
Research designs, instrumentation and measurement, data collection strategies, analytic techniques, and the writing and evaluation of research reports.

PADM 688 Land Use and Planning Law (3.0)
Note: Crosslisted with PLAN 605 & UPA 678.
Examination of pertinent legal issues, including ordinances, state and federal legislation, and court rulings, impinging on planning and land use activities.

PADM 695 Thesis (1.0-6.0)
Prerequisite: Permission of internship-practicum coordinator.

Pan-African Studies

PAS 500 Cooperative Internship in Pan African Studies (3.0-6.0)
Prerequisites: 12 hours PAS above introductory level.
Assignment with a public agency or organization. Written report and periodic consultation with a professor may be required. May be repeated for credit but only 3 hours apply towards major or minor.

PAS 505 The Black Atlantic (3.0)
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 (3.0)
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 508 Independent Study (3.0)
Prerequisite: Overall gpa of 3.0, a gpa of 3.5 in the department and at least 18 semester hours credit in the department.
Independent study on a topic related to the African diaspora.

PAS 510 Advanced Topics in Afro-American and African Studies (3.0)
Advanced study of a particular topic, issue or area in African-American culture or history, to be announced in Schedule of Courses. May be repeated as topics vary, but no more than six hours will be accepted in the major.

PAS 514 History of Pan-African Social Thought (3.0)
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 (3.0)
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.

PAS 520 The Black Family (3.0)
Prerequisite: Senior standing.
Nature and function of African-American familial systems from the slave era to the present. Emphasis on impact of public policy on socioeconomic and political status of Black family structures. (Social Sciences)

PAS 528 History of African American Education (3.0)
Prerequisite: Senior standing or consent of instructor.
The role of education in the history of African Americans. The struggle to secure educational opportunity, access to educational institutions, the types of education available, the prevailing philosophical and political issues related to the education of African Americans will be examined in the larger contexts of African American and American educational history. (Social Sciences)

PAS 529 Teacher Institute on African-American Issues (3.0)
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 (3.0)
Note: Cross-listed with EDEM/EDSD 592.
An intensive survey of the history and culture of African-Americans for teachers.

PAS 535 History of African Americans in Kentucky (3.0)
Prerequisite: Senior standing or faculty consent.
The history of African Americans in Kentucky from the settlement of the trans-Appalachian region to the present. Special attention to the history of African Americans in Louisville and Jefferson County. The use of primary, secondary, and oral historical sources will be emphasized. (Social Sciences)

PAS 540 Pedagogy of African Studies (3.0)
Designed for teachers preparing to introduce African studies materials to primary and secondary school students.

PAS 550 African Popular Culture (3.0)
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 551 Studies in African American Literature (3.0)
Note: Crosslisted with ENGL 550.
Prerequisites: English 102 or 105 and junior standing.
In-depth study of selected movements, topics, or groupings of African American writers.

PAS 560 Geography and Nutrition Among Africans and African Americans (3.0)
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 562 Women's Health in Africa (3.0)
Prerequisite: Senior standing.
Examination of population growth, early marriage, family size, and cultural and religious beliefs on reproduction on the health of the contemporary African woman. (Social Sciences)

PAS 566 Race and Gender in Psychological Research (3.0)
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 (3.0)
Prerequisites: ENGL 102 or 105 or junior standing.
Note: Crosslisted with ENGL 567.
Examination of 'post-coloniality' through a selection of fiction and literacy criticism by African writers.

PAS 575 Genre Studies in African-American Literature (3.0)
Note: Crosslisted with ENGL 575.
Prerequisites: English 102 or 105 and junior standing.
In -depth study of a selected genre of African-American Literature.

PAS 577 The Harlem Renaissance (3.0)
Note: Crosslisted with ENGL 577.
Prerequisites: English 102 or 105 and junior standing.
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.

PAS 581 Pan-African Art: Form and Content (3.0)
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 (3.0-6.0)
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.

PAS 590 Studies in African History (3.0)
Note: Cross-listed with HIST 590.
Prerequisites: Junior standing or faculty consent.
Intensive study of a particular topic chosen by the instructor, for example, slavery and the slave trade, traditional kingdoms. (Social Sciences).
9 hours of HIST or PAS is recommended.

PAS 605 Special Topics in Pan African Studies (3.0)
Examination of a specific social, cultural or historical theme related to persons of African ancestry, past or present, in one or more regions of the world.

PAS 606 Independent Study (1.0-3.0)

PAS 614 History of Pan-African Social Thought (3.0)
Prerequisites: Graduate standing.
Writings and critiques of the major African decended thinkers of the 20th Century. Special emphasis on the ideas of Booker T. Washington, W.E.B. DuBois, Marcus Garvey, Martin Luther King, Jr., and Malcolm X.

PAS 615 Advanced Seminar on Race (3.0)
Prerequisites: Graduate standing.
An intensive examination of the evolution, meaning, and significance of race and racism as historical and social constructs.

PAS 619 Advanced Seminar in African American Studies (3.0)
Prerequisites: Graduate Standing.
An intensive examination of selected topics in African American history and culture.

PAS 625 African Americans in Contemporary American Society (3.0)
An intensive, multi-disciplinary examination of the status of African-Americans in the Post-Civil Rights Era (since 1970). Focus specifically on the demography, politics, social-cultural, educational and economic realities of contemporary African-Americans.

PAS 660 Geography and Nutrition Among African and African American Populations (3.0)
Note: Crosslisted with GEOG 620.
An in-depth examination of the nutritional status of Africans, African-Americans and persons of African descent. The course will focus on comparison of epidemiological transition, political economy of nutrition, politics of food welfare programs, food-aid, over-nutrition (obesity), under-nutrition and dietary-related diseases among African-Americans, Africans and other persons including blacks in Diaspora.

PAS 664 Approaching African-American Theatre (3.0)
Theoretical approaches and practical methods of performing, designing, staging and teaching theatre, literature, and art that spring from an afrocentric perspective. Designed to prepare students to integrate African-American topics into their teaching and to collaborate successfully as artists.

Public Health Clinical Investigation

PHCI 601 Evaluating Health Care Literature (1.0)
A review of formal methods for evaluating the medical literature including those of the University of Rochester Clinical Pharmacology Group; and the Evidence Based-Medicine Group. Meta-Analysis: sources of information, using medical informatics, selection of trails, pooling of data, analyzing pooled data and interpreting results, problems and limitations of meta analysis will be covered.

PHCI 602 Health Services and Outcomes Research (2.0)
Prerequisites: Fundamentals of Biostatistics or equivalent or permission of instructor.
Understanding the multiple dimensions of health status and conceptual basis for measuring health status and outcomes; review and evaluation of the strengths and weaknesses of common measures. Formalization of research questions and design of appropriate methodology including sample selection, measurement, data, collection and statistical analysis.

PHCI 605 Survey Research Methods (2.0)
Previews the advantages and disadvantages of alternative methodologies for the collection of health data including record reviews, face-to -face and telephone interviews as well as the design of data collection instruments, scale construction, and data management. Special consideration is given to the sources of bias in alternative data collection strategies and to the reliability and validity of the data. Attention is also given to data management issues.

PHCI 611 Introduction to Epidemiology and Public Health (2.0)
A comprehensive introduction to public health with an emphasis on population-based approaches to health issues. Both classical and clinical epidemiology will be presented. The course will cover health status indicators, including morbidity, mortality, vital statistics and measures of quality of life. The global applications of epidemiology and international health through investigations of the leading causes of morbidity and mortality in developed, developing and under developed nations. Epidemiological concepts will be linked with computer exercises to re-enforce learning and practical applications.

PHCI 614 Infectious Disease Epidemiology (1.0)
Prerequisites: PHCI 611, PHCI 621 or equivalent.
This course covers epidemiology of infectious diseases with an emphasis on basic methods as applied to dynamics of transmission, vaccine effectiveness, acute respiratory infections including tuberculosis, diarrheal diseases, sexually transmitted diseases (e.g. HIV), and hepatitis.

PHCI 621 Fundamentals of Biostatistics (2.0)
An introduction to descriptive and inferential statistics including measurement theory; Bayesian Probability; the logic of hypothesis testing (alpha,beta and power); confidence intervals; the Normal, Student's t, Chi Square and F sampling distributions and their application will be covered. Computer assisted instruction and laboratory assignments including an introduction to SAS and SPSS.

PHCI 622 Case Control Studies (2.0)
Prerequisites: Fundamentals of Biostatistics or equivalent or permission of instructor.
Advantages and disadvantages of case-control designs, population based controls, matching, sources and types of bias, confounding, statistical methods including Chi Square, log-linear methods, analysis of variance, logistic regression, and McNemar's Test.

PHCI 623 Design and Analysis of Cohort Studies (2.0)
Prerequisites: Fundamentals of Biostatistics or equivalent or permission of instructor.
Advantages and disadvantages of prospective and retrospective designs, sources of bias in cohort studies, quality of data in retrospective designs, registries, case loss, controlling for confounders, cross classification and procedural methods, multivariate statistical methods, and applications of the general linear model.

PHCI 624 Clinical Trails I: Planning and Design (2.0)
Prerequisites: Fundamentals of Biostatistics or equivalent or permission of insstructor.
Phases of trials, experimental designs, inclusion and exclusion criteria, randomization and blinding, the general linear model and mixed and fixed effects repeated measures analysis of variance, intention to treat methods, survival analysis.

PHCI 625 Clinical Trails II (2.0)
Prerquisites: Clinical Trials I or permission of instructor.
Protocol development; patient recruitment and retention; safety and efficacy; benefit to risk assessment; monitoring and auditing trials; terminating or extending clinical trials; and, regulatory, patent and legal considerations.

PHCI 631 Social and Behavioral Sciences in Health Care (2.0)
This course introduces public health students to social science perspectives and research on selected topics in health and health care. The course is organized into the following units: the sociology of knowledge and health behavior modeling; the social distribution of health, disease and utilization by social variables; social problems (e.g., violence and substance abuse) as public health concerns; health care industry and policy health behavior and the psychology of illness; international health and health care systems; and genetics and public health.

PHCI 632 Ethical Conduct of Health Care Research (2.0)
An introduction to the ethical principles and topics of medical research and data collection and evaluation. The basic ethical principles to be covered including autonomy, beneficience, rights and justice. Specific topics include: the ethics of treatment of patients versus research on human subjects; informed consent including proxy consent; subject confidentiality in research and publication; and , the special problems of pediatric research.

PHCI 651 Introduction to Environmental Health (2.0)
The course will lay a foundation for students to build upon their medical and scientific background in applying clinical skills in the resolution of real, in-the-field, community-based problems. The course will cover: Environmental molecular epidemiology; Environmental toxicology principles and practices; Exposure assessment in environmental sciences; Fundamentals of residential health surveillance; Fundamentals of occupational health surveillance; Air monitoring for toxic substances; principles and practices; Hazardous waste management; Fundamentals of health risk assessment.

PHCI 661 Introduction to Public Health Informatics (1.0)
Students will: learn the fundamentals of HTML; the use of MEDLINE, Ovid, PubMed, and Grateful Med; become familiar with the rolesand domains for computer scientists, epidemiologists,policy makers and programmers in information system development; be able to think in terms of information systems and underlying technologic infrastructure; have a basic understanding of computer networking; understanding the basics of database management systems and current database technology.

PHCI 662 Health Care Economics (2.0)
The course aims to provide a comprehensive groundwork in the economics of health care and a health care sector. The trainee will be able to effectively analyze issues in the health sector from an economic perspective and determine primary and secondary effects of change in the health care market. Attention is given to the basic theory and techniques of cost-benefit, cost-effectiveness and cost-utility analysis as well as methods for valuing outcomes.

PHCI 663 Role of Federal Government in Health Care (2.0)
This course introduces non-lawyers to the important role of both the Federal and state governments in public health. Their roles in such issues as individual rights and privacy, public health initiatives, and legal rights to access health care are examined using judicial opinions, statutes and regulations.

PHCI 672 Preventative Medicine II: Individual Health Assessment and Risk Factor Modification (2.0)
This course examines techniques for assessing and evaluating the health behaviors of individuals and on the techniques and strategies for modifying individual's risk factors for illness. Risk factors for cardiovascular disease, cancer, infectious diseases, STD's (e.g.HIV) and other chronic diseases are emphasized.

PHCI 699 Mentored Research-Thesis Preparation (1.0-6.0)
Prerequisites: Completion of 1st year PHCI courses.

PHCI 796 Effective Grant Writing (1.0)
This course is designed to prepare students to write competitive grant proposals. Topics to be coverd include overall strategy for grant writing, concerns commonly cited by reviewers, how NIH applications are reviewed, and grant administration.

Public Health Decision Science

PHDA 602 Biostatistics-Decision Science Seminar (1.0)
.5 lecture, .5 independent study.
Students are given an evaluation protocol for each semester and must turn in a written evaluation of the presentation. The protocols will vary according to the presentation topic, but each will focus on a critical component of research design or analysis.

PHDA 603 Biostatistics-Decision Science Public Health Practicum I (1.0-2.0)
A student is assigned to a health care agency and works with the staff of that agency on a policy issue facing that agency.

PHDA 604 Biostatistics-Decision Science Public Health Practicum II (1.0-2.0)
Prerequisites: PHDA 603.
A study is assigned to a health care agency and works with the staff of that agency on a policy issue facing that agency.

PHDA 660 Mathematical Tools (4.0)
Prerequisites: Math 190 or equivalent or consent of instructor.
This course focuses on the basic techniques of analytic geometry, differential and integral calculus, and matrix algebra; topics include limits, the chain rule, higher-order derivatives, partial derivatives, integration by parts, improper integrals, multiple integrals, sequences and series, vector and matrix arithmetic, and eigenvalues

PHDA 661 Probability (3.0)
Prerequisites: Mathematical Tools (PHDA 660) or equivalent.
This course in introductory probability theory; includes probability spaces, random variables, probablity distributions, moments, moment generating functions, mathematical expectation, joint distribution, transformations of random variables, sampling distributions.

PHDA 662 Mathematical Statistics (3.0)
Prerequisites: Mathematical Tools (PHDA 660) and Probability (PHDA 661) or equivalent.
This course in introductory statistical theory; includes limiting distributions, central limit theorem, point estimation, maximum likelihood estimation, least squares, sufficiency and completeness, confidence intervals, Bayesian estimation, Neyman-Pearson theory of hypothesis testing, statistical power, uniformly most powerful tests, likelihood ratio tests, non-central distributions, advanced topics as time permits.

PHDA 663 Decision Analysis (3.0)
Prerequisites: Mathematical Tools (PHDA 660), Probability (PHDA 661) and Mathematical Statistics (PHDA 662) or equivalent.
This course teaches methods for making decisions in complex situations especially those involving conflicting values, uncertainty, or risk. Thinking from the early foundations in economics through current methods is covered. Included are methods of value or utility elicitation and probability assessment. Analysis methods covered include decision trees, conjoint measurement, and multiattribute utility theory. Also covered are findings from psychology on cognitive errors, which are common in decision making.

PHDA 691 Bayesian Inference and Decision (3.0)
Prerequisites:PHDA 660.
Focus on the use of Bayesian probability and statistics in both scientific inference and formal decision analysis. The frequency and subjective interpretations of probability are explored, as well as probability and decision making.

Philosophy

PHIL 501 Independent Study (1.0-3.0)

PHIL 503 Philosophical Writing and Research (3.0)
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 (3.0)
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 (3.0)
Prerequisite: To be determined by instructor, in the light of the topic chosen for that semester. Offered as needed.

PHIL 512 Advanced Symbolic Logic (3.0)
Prerequisite: Introduction to Symbolic Logic (312) or consent of instructor.
Topics in the theory and application of modern logic.

PHIL 521 Ethical Theory (3.0)
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 (3.0)
Prerequisite: Two courses in Philosophy or consent of instructor.
Historical and contemporary approaches to ethics that emphasize virtue and character.

PHIL 523 Applied Philosophy (3.0)
Prerequisites: One course in Philosophy or consent of instructor.
Intensive study of one or more philosophical problems of individual or collective behavior in institutions, professions, or community affairs.

PHIL 524 Philosophies of Peace (3.0)
History of peace movements; analysis of concepts of nonviolence pacifism, positive and negative peace; approaches to conflict resolution and negotiation for global and local conflicts. Multi-disciplinary.
Credit may not be earned for 524 and 624.

PHIL 528 Philosophy of Mind (3.0)
Prerequisite: Two semesters of philosophy or consent of instructor.
Philosophical analysis of contemporary theories about the mind.

PHIL 531 Aesthetics (3.0)
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.

PHIL 534 Critical Theory: The Frankfurt School (3.0)
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 535 Political Philosophy (3.0)
Prerequisite: Two courses in philosophy and/or political science.
The main concepts of contemporary political thought: Rights, law, power, ideology, legitimacy, democracy, tyranny, the state, and justice, with the focus on the topic of political action in both its individual and collective forms. Credit cannot be earned in both 535 and 635.

PHIL 536 Philosophy of Science (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Junior standing or consent of instructor.
Philosophical problems concerning knowledge, especially perception, memory, and other minds.

PHIL 540 Recent Epistemology (3.0)
Intensive study of current theory and research in epistemology.

PHIL 553 Plato and Platonism (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Two semesters of philosophy or consent of instructor.
Marxist thought from historical and systematic viewpoints.

PHIL 566 Philosophy of Socialism (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Two semesters of philosophy or consent of instructor.
The thought of Kierkegaard, Nietzsche, Heidegger, Jaspers, Sartre, Marcel, and others, and its significance.

PHIL 575 Postmodernism (3.0)
Multidisciplinary examination of challenges to ideals, norms, and beliefs of modernity, and identifying characteristics of postmodern thought, as they appear in various disciplines and in cultures. Credit may not be earned for 575 and 675.

PHIL 576 Philosophical Analysis (3.0)
Prerequisite: Recent Philosophy (PHIL 304).
Selective study of 20th century philosophy in the English-speaking world.

PHIL 601 Independent Study (1.0-3.0)
Directed study and research.

PHIL 602 Independent Study (1.0-3.0)
Refer to: PHIL 601

PHIL 603 Philosophical Writing and Research (3.0)
Development of analytical abilities in philosophical reading and writing; argument analysis and construction in various modes and styles.

PHIL 605 Special Topics (3.0)
Prerequisite: To be determined by instructor, in the light of the topic chosen for that semester.

PHIL 608 Aquinas (3.0)
The works of Thomas Aquinas studied from historical and systematic viewpoints.

PHIL 610 Descartes (3.0)
The works of Rene Descartes, studied from historical and systematic viewpoints.

PHIL 620 Kant (3.0)
The works of Immanuel Kant, studied from historical and systematic viewpoints.

PHIL 623 Applied Philosophy (3.0)
Prerequisites: One course in Philosophy or consent of instructor.
Intensive study of one or more philosophical problems of individual or collective behavior in institutions, professions, or community affairs.

PHIL 624 Philosophies of Peace (3.0)
History of peace movements; analysis of concepts of nonviolence pacifism, positive and negative peace; approaches to conflict resolution and negotiation for global and local conflicts. Multi-disciplinary.
Credit may not be earned for 524 and 624.

PHIL 625 Hegel (3.0)
The works of Hegel, studied from historical and systematic viewpoints.

PHIL 631 Aesthetics (3.0)
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 (3.0)
The works of William James, studied from historical and systematic viewpoints.

PHIL 635 Political Philosophy (3.0)
Prerequisite: Two courses in philosophy and political science.
The main concepts of contemporary political thought: Rights, law, power, ideology, legitamacy, democracy, tyranny, the state, and justice, with the focus on the topic of political action in both its individual and collective forms. Credit cannot be earned in both 535 and 635.

PHIL 640 Recent Epistemology (3.0)
Intensive study of current theory and research in epistemology.

PHIL 641 Recent Philosophy of Language (3.0)
Note: Cross-listed with LING 641.
Intensive study of current theory and research in the philosophy of language.

PHIL 660 Wittgenstein (3.0)
The works of Wittgenstein, studied from historical and systematic viewpoints.

PHIL 671 Heidegger (3.0)
The works of Martin Heidegger, studied from historical and systematic viewpoints.

PHIL 674 Sartre (3.0)
The works of Jean-Paul Sartre, studied from historical and systematic viewpoints.

PHIL 675 Postmodernism (3.0)
A multi-disciplinary examination of challenges to ideals, norms, and beliefs of modernity, and identifying characteristics of postmodern thought, as they appear in various disciplines and in culture. Credit may not be earned for 575 and 675.

PHIL 681 Philosophies of Community (2.0-3.0)
Historical survey of some major theories of community, critical analysis of the concept, and the development of individual theories.

PHIL 695 Thesis Guidance (3.0)

PHIL 696 Thesis Guidance (3.0)
Refer to: PHIL 695

Pharmacology and Toxicology

PHTX 601 Principles of Medical Pharmacology (7.0)
Graduate student enrollment is limited. The course encompasses the principal classes of drugs. Spring semester, yearly.

PHTX 603 Pharmacolgy and Dental Therapeutics (4.0)
Prerequisite: Consent of instructor.
Course encompasses the principal classes of drugs. Spring semester, yearly.

PHTX 606 Seminar (1.0)
Participation by attendance and oral presentation of curent topics in Pharmacology and Toxicology. Fall and Spring semesters, yearly.

PHTX 607 Seminar in Genetics and Molecular Medicine (1.0-2.0)
Participation by attendance and oral presentation of current topics in genetics and molecular medicine. Fall and spring semesters, yearly.

PHTX 616 Advanced Pharmacology (1.0-12.0)
Work conducted outside the thesis area and with a preceptor other than the thesis director. By special arrangement.

PHTX 618 Topics in Pharmacology & Toxicology (1.0-12.0)
Prerequisite: Department majors only.
Topics of current interest in Pharmacology and Toxicology. By special arrangement.

PHTX 619 Research (1.0-12.0)

PHTX 620 Thesis (1.0-6.0)

PHTX 630 Toxicology: Principles and Application (3.0)
Prerequisites: PHTX 601 and PHY 605/606.
A survey of the interdisciplinary science of toxicology, providing an introduction to concepts concerning adverse effects of toxic agents on physological systems. By special arrangement.

PHTX 633 Biochemical Neuropharmacology (2.0)
Prerequisite: PHTX 601 or concurrently taken.
A course on the biomedical basis of neurotransmitter action, with particular emphasis on the central nervous system. Recent advances in neurotransmitter mechanisms will be emphasized. By special arrangement.

PHTX 636 Biomedical Molecular Pharmacology (2.0)

PHTX 650 Advanced Nursing Pharmacology (3.0)
Provides the basic pharmacological foundation for the nurse practitioner and clinical specialist in advanced practice.

PHTX 660 Principles of Drug and Chemical Action (3.0)
Prerequisite: A biochemistry and physiology course, or consent of instructor.
Fate of drugs and chemicals following their administration. Distribution, metabolism, molecular mechanisms of action, and tolerance. Fall semester.

PHTX 661 Molecular Mechanisms of Drug Action (2.0)
Prerequisite: PHTX 667 and BIOC 668, or consent of the instructor.
Considers the molecular interactions of several classes of drugs and toxicants on a variety of cytoplasmic and nuclear processes, including signal transduction pathways, cell cycle checkpoints, DNA repair and DNA replication. Spring semester.

PHTX 663 Neuropharmacology (2.0)
Prerequisite: PHTX 601 or 660 and consent of instructor.
Biochemical effects of drugs which act on the autonomic and central nervous system. By special arrangement.

PHTX 665 Research Methods in Pharmacology and Toxicology (1.0-12.0)
A laboratory course exploring experimental design, modern pharmacological techniques, data analysis and microcomputer application.

PHTX 667 Advanced Cell Biology (3.0)
Prerequisite: One quarter of graduate level Biochemistry or consent of instructor.
Note: Crosslisted with BIOC 667, ASNB 667, BIOL 667 and MBIO 667.
Advanced treatment of contemporary cell biology including membrane structure and function, cytoskeleton, signal transduction, regulation of cell cycle, apoptosis, and molecular mechanisms of cellular differentiation. Spring semester only.

Physiology and Biophysics

PHY 601 Mammalian Physiology (9.0)
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 (6.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-12.0)
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 (1.0)

PHY 619 Research (1.0-20.0)

PHY 620 Thesis (1.0-6.0)

HY 621 Methods in Cellular Fluorescence (3.0)
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.

PHY 625 Experimental Physiology Laboratory I (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Continuation of 625. Spring.

PHY 652 Renal Mechanisms in Pathological Conditions (3.0)
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 (3.0)
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 680 Physiology of Inflammation (3.0)
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 (3.0)
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 (2.0)
Review of the historical background which binds Physiology and Medicine. Readings and discussion of history from Aristotle to the present. Fall.

PHY 799 Dissertation (1.0-12.0)
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.

Physics

PHYS 501 Independent Study (1.0-3.0)

PHYS 502 Independent Study (1.0-3.0)
Refer to: PHYS 501

PHYS 520 Vibrations and Sound (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisites: PHYS 450,451.
Propagation of electromagnetic fields with applications to optics and microwave physics.

PHYS 545 Advanced Optics (3.0)
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 (1.0)
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 (3.0)
Prerequisites: PHYS 450,460.
Shrodinger equation and solutions. Introduction to perturbation theory; applications.

PHYS 556 Quantum Theory of Matter (3.0)
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 Mathematical Physics I & II (3.0)
Prerequisites: PHYS 450 or equivalent..
Selected mathematical techniques and their applications to various fields of physics.

PHYS 562 Mathematical Physics II (3.0)
Refer to: PHYS 561

PHYS 565 Computational Physics (3.0)
Prerequisites: PHYS 390, and 555 or 561 taken concurrently; familiarity with a programming language.
Introduction to modern computational methods in physics with application to problems in different branches of physics.

PHYS 570 Atomic and Molecular Physics (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 590 Astrophysics (3.0)
Prerequisites: PHYS 307, PHYS 455.
Physics applied to the interstellar medium; the atmospheres, structure, and evolutiom of stars; galaxies.

PHYS 595 Special Topics (1.0-3.0)
Introduction to an advanced topic or elaboration of an intermediate topic not treated comprehensively in a regular course.

PHYS 605 Theoretical Mechanics (3.0)
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 Electromagnetic Theory I (3.0)
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 612 Electromagnetic Theory II (3.0)
Refer to: PHYS 611

PHYS 621 Quantum Mechanics I (3.0)
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 622 Quantum Mechanics II (3.0)
Refer to: PHYS 621

PHYS 623 Relativistic Quantum Mechanics (3.0)
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 (3.0)
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 Solid State Physics I (3.0)
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 641 Solid State Physics II (3.0)
Refer to: PHYS 640

PHYS 670 Special Topics (1.0-12.0)
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 (1.0-12.0)
Prerequisite: Consent of instructor.
Advanced study conducted under the direction of a faculty member.

PHYS 695 Research Seminar (1.0-12.0)
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 (1.0-12.0)
Prerequisite: Consent of instructor.

Planning

PLAN 500 Foundations of Economics (3.0)
Prereqisites: Consent of instructor.
Note: Crosslisted with ECON 500.
Survey of supply and demand analysis, cost and production, and price determination in different market organizations. Analysis of GDP, unemployment, inflation, and economic growth.

PLAN 501 Urban Environmental Quality (3.0)
2 lecture, 2 field work.
Prerequisites: Consent of instructor.
Note: Crosslisted with GEOG 561.
A study of environmental aspects of urban areas and analysis of inter-and intra-city variations in environmental quality.

PLAN 600 Planning History and Issues (3.0)
Prerequisites: Consent of instructor.
Note: Crosslisted with GEOG 628.
The history of planning and contemporary issues with a special emphasis on the role of planners, zoning and law.

PLAN 601 Planning Theory (3.0)
Note: Crosslisted with PADM 607 and UPA 684.
In-depth examination of urban and regional planning theory, with special focus on the rational comprehensive model.

PLAN 602 Statistics for Public Affairs (3.0)
Note: Crosslisted with PADM 601.
Covers descriptive statistics, probability, sampling, tests of significance, correlation, regression analysis, and the use of statistical software packages.

PLAN 603 Urban Economics (3.0)
Prerequisites: PLAN 500, ECON 500 or consent of instructor.
Note: Crosslisted with ECON 605, UPA 603, and PADM 640.
Application of economic theory to urban policy issues including metropolitan development and job creation, poverty, crime, transportation, environment, spatial structure, and other issues.

PLAN 604 Applied Research Methods (3.0)
Note: Crosslisted with PADM 602.
Provides students with the basic analytical tools commonly used by professional planners and public administrators. The use of computers in applying these tools will be emphasized.

PLAN 605 Land Use & Planning Law (3.0)
Note: Crosslisted with PADM 688 & UPA 678.
Examination of pertinent legal issues, including ordinances, state and federal legislation, and court rulings impinging on planning and land use activities.

PLAN 606 Professional Practice (3.0)
Topics include: goverment organization; the role of planning in governmental decision-making; the planner's relations with citizens, politicians and administrators; strategies for dealing with conflict, pressure, and uncertainty; and ethics.

PLAN 607 Land Use Planning (3.0)
Note: Crosslisted with UPA 683.
This course provides an understanding of the history and current characteristics of land use planning and policy. Topics include the comprehensive plan, regulatory controls such as zoning, fiscal mechanisms of control, land use and environmental disputes, regional planning, and growth management.

PLAN 608 Geographic Information Systems (3.0)
Prerequisites: Consent of instructor.
Note: Crosslisted with GEOG 657and UPA 629.
Application of GIS to real world projects. An emphasis will be placed on the development of a digital spatial database.

PLAN 609 Public Budgeting and Finance (3.0)
Note: Crosslisted with UPA 647 and PADM 604.
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.

PLAN 610 Strategic Management and Planning (3.0)
Note: Crosslisted with UPA 672 and 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.

PLAN 611 Human Resources Management (3.0)
Note: Crosslisted with PADM 642 and UPA 667.
Basic theories, public policies, laws, regulations, problems, and prospects of human resource development and management within the context of the public sector.

PLAN 612 Mediation and Dispute Resolution (3.0)
Note: Crosslisted with PADM 648.
Designed principally for incipent practioners of the mediation process. Class participation serving as a mediator in cases presented to the class, and a short paper depicting mediating in process are the course requirements.

PLAN 613 Public Administration and Organizational Theory (3.0)
Note: Crosslisted with PADM 600, POLS 625, and UPA 661.
Basic principles of public administration, with analysis of problems of bureaucracy, organization, financial management, and public policy.

PLAN 614 Retail Site Analysis (3.0)
Prerequisites: Consent of Instructor.
Note: Crosslisted with GEOG 635.
Examination of market structure, retail environment, and physical site characteristics. Utilizes current practices in discipline to determine optimum retail location.

PLAN 615 Spatial Statistics (3.0)
Prerequisites: PLAN 602 or consent of instructor.
Note: Crosslisted with GEOG 656.
The analysis of spatial patterns and processes through the use of spatially-based statistics.

PLAN 616 Analytical Urban Geography (3.0)
Prerequisites: GEOG 328, SOC 305, or consent of instructor.
Note: Crosslisted with GEOG 658.
Advanced analysis of urban spatial processes and patterns with an emphasis on qualitative models.

PLAN 618 Urban Demography (3.0)
Prerequisites: GEOG 328 or consent of instructor.
Note: Crosslisted with GEOG 631.
A spatial analysis of the distribution, characteristics, growth and change of the population of a metropolitan area.

PLAN 619 Urban Geographic Information Systems Applications (3.0)
Prerequisites: PLAN 608, UPA 629, or GEOG 657.
Application of advanced GIS concepts to urban planning database projects.

PLAN 620 Environmental Policy (3.0)
Note: Crosslisted with PADM 627 & UPA 679.
Survey of environmental issues and policies designed to address those issues.

PLAN 621 Urban Infrastructure (3.0)
Note: Crosslisted with UPA 696.
Planning, financing, implementation, and operation of urban infrastructure systems.

PLAN 622 Urban Design (3.0)
2 lecture, 1field work.
Note: Crosslisted with PADM 622 & UPA 682.
Covers theories, principles, and processes of urban design, including applications to actual design problems.

PLAN 623 Environmental Policy and Natural Hazards (3.0)
Note: Crosslisted with PADM 630 and UPA 687.
Explores the relationship of environmental policy and planning with natural hazards and disasters, with an emphasis on preparation for and mitigation of impacts.

PLAN 624 Urban Transportation Planning (3.0)
Prerequisites: ECON 605, PADM 640, PLAN 603, or UPA 603.
Note: Crosslisted with UPA 690.
Analysis of characteristics and costs of existing and innovative urban transportation systems. Role of planning methods in estimating transportation usage and chosing optimal plans.

PLAN 628 Economic Conditions and Forecasting (3.0)
Prerequisites: ECON 600 or ECON 605/UPA 603/PLAN 603/PADM 640.
Note: Crosslisted with ECON 620 and UPA 624.
Develops quantitative tools for the analysis and forecasting of economic phenomena. Both structural & time models are presented. Basic econometric methods are used to fit models and evaluate their forecasting properties.

PLAN 632 Independent Study (1.0-6.0)

PLAN 649 Planning Internship (3.0)
Prerequisites: Consent of instructor.
Provides an opportunity for students to obtain and reflect upon professional experience in urban planning.

PLAN 650 Capstone Studio (3.0)
This course integrates the various elements of the planning program while providing the opportunity to work on real planning problems.

PLAN 680 Special Topics in Urban Planning (1.0-6.0)
An advanced study of a selected topic in urban planning.

Political Science

POLS 501 Topics in American Politics (3.0)
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 (3.0)
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 Theory (3.0)
Prerequisite: Senior standing or faculty consent.
An examination of one or more selected topics in the study of political philosophy. Individual research projects and reports are required.

POLS 505 Topics in Urban and Public Policy (3.0)
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 (3.0)
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 Practicum (1.0-3.0)
Prerequisite: Consent of instructor.
Practical internship in government. Application must be made before enrollment. Placement opportunities are limited.

POLS 511 Practicum (1.0-3.0)
Refer to: POLS 510

POLS 519 Urban Poverty and Policy (3.0)
An examination of the causes of the poverty problem in American cities and the public policy responses to that problem.

POLS 530 International Negotiation (3.0)
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 552 Politics through Film (2.0-3.0)
An examination of authority patterns, political change, using cinematic portrayals as the primary literature base for investigation.

POLS 554 Democratization and Regime Change (3.0)
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 563 Women in Developing Countries (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Exploration of field of urban politics/government with focus on urban institutions, governance and selected urban problems and policies.

POLS 615 Administrative Law and Process (3.0)
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 (3.0)
Formulation, implementation, qualitative evaluation, ethical aspects of public policy including political, legal, and administrative aspects.

POLS 620 Topics in Public Policy (3.0)
An examination of one or more selected topics in the study of public policy.

POLS 625 Public Administration and Organizational Theory (3.0)
Note: Crosslisted with UPA 661, PADM 600, & PLAN 613.
Basic principles of public administration, with analysis of problems of bureaucracy, organization, financial management, and public policy..

POLS 626 Public Personnel Policy (3.0)
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 (3.0)
Current approaches, issues in American politics, evaluation of state of knowledge in various subfields of American government, politics.

POLS 630 Topics in American Politics (3.0)
Investigation of selected problems in American politics.

POLS 638 Seminar in American Foreign Policy (3.0)
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 (3.0)
Study of world politics, focusing on central theoretical, perspectives and substantive issues affecting interstate conflict and cooperation.

POLS 640 Topics in International Relations (3.0)
Study of selected substantive or theoretical issues involving world politics. Topics will vary from semester to semester.

POLS 647 Seminar in Latin America (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
A survey of research techniques in the field of government.

POLS 691 Independent Study I (1.0-12.0)
Credit according to achievement.

POLS 692 Independent Study II (1.0-12.0)
Credit according to achievement.

POLS 695 Directed Research (3.0)
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 (1.0-6.0)

Psychology

PSYC 501 History of Psychology (3.0)
Prerequisites: PSYC 201 or consent of instructor.
Emergence of experimental and clinical psychology from its philosophical and physiological origins.

PSYC 514 Advanced Statistics (3.0)
Prerequisites: Junior standing or consent of instructor.
Note: Fall only.
Review of elementary statistics from a theoretical point of view; probability theory including sample spaces, random variables, density and distribution functions, expectations, and moments; estimation and properties of estimators; hypothesis testing, regression and correlation, and nonparametric methods.

PSYC 516 Introductory Mathematical Psychology (3.0)
Prerequisites: PSYC 201 or consent of instructor.
Survey of basic applications of probability and mathematics to models and theories in learning, perception, and social psychology.

PSYC 524 Psycholinguistics (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
A survey of phenomena in sensation and perception, including the study of methods and mechanisms.

PSYC 543 Sensory Processes (3.0)
Prerequisites: PSYC 201 or consent of instructor.
Survey of physiological, neurological, and psychological bases of vision, audition, somesthesis, and other senses.

PSYC 544 Animal Behavior and Behavioral Ecology (3.0)
Prerequisites: PSYC 201 or consent of instructor.
Survey of sensory and behavioral characteristics of animal species, with stress upon ecological variables.

PSYC 556 Human Engineering (3.0)
Prerequisites: PSYC 201 or consent of instructor.
Application of experimental methods and data to problems of engineering and production.

PSYC 561 Evolutionary Psychology (3.0)
Prerequisites: PSYC 201 or consent of instructor.
Evolution of epigenetic processes and reproductive and parental strategies. Emphasis upon primate and human psychosocial development.

PSYC 566 Race and Gender in Psychological Research (3.0)
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 (3.0-4.0)
Prerequisites: Consent of instructor.
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 (3.0)
Prerequisites: PSYC 201 or consent of instructor.
A review of major personality theories in terms of experimental and clinical findings.

PSYC 581 Introduction to Behavioral Medicine (3.0)
Prerequisites: PSYC 201 or consent of instructor.
Survey of theory and research on psychological factors which contribute to the occurrence, severity, and remediation of illness and disease.

PSYC 585 Abnormal Psychology (3.0)
Prerequisite: 6 hours of psychology.
An introduction to nature and causes of maladjusted behavior; emphasis on factors which may affect personality development.

PSYC 600 Research in Cognition (1.0-3.0)
Prerequisite: Consent of Area Coordinator.
Supervised research on topics in cognition. May be repeated.

PSYC 601 Research in Social Psychology (1.0-3.0)
Prerequisite: Consent of area coordinator.
Supervised research on topics in social psychology. May be repeated.

PSYC 602 Research in Perception and Sensory Physiology (1.0-3.0)
Supervised research on topics in perception and sensory physiology. May be repeated.

PSYC 603 Master's Research (1.0-6.0)
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. This research can take the form of either a Master's Thesis project or a research portfolio as specified by the student's program.

PSYC 604 Independent Study (Reading) (1.0-6.0)
Prerequisite: Consent of instructor.
Pass/Fail grading.

PSYC 605 Independent Study (Research) (1.0-6.0)
Prerequisite: Consent of instructor.
Pass/Fail grading.

PSYC 606 Professional Development Lab (1.0-3.0)
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 (1.0-3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: PSYC 514.
A second course for graduate students in experimental design and statistical analysis.

PSYC 612 Advanced Statistics III (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Analysis of basic concepts and techniques of conditioning and discussion of major theoretical issues.

PSYC 621 Cognitive Processes (3.0)
Prerequisite: Consent of instructor.
Discussion of attention, memory, thinking, and concept learning; language; and problem solving.

PSYC 622 Proseminar in ognition (1.0-3.0)
Prerequisite: Consent of Area Coordinator.
Critical study of theory and research in cognitive psychology. May be repeated.

PSYC 624 Language and Cognition (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0-0.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Prerequisite: PSYC 542 and consent of instructor.
The effects of various classes of chemical compounds on experience and behavior.

PSYC 642 Behavioral Neuroscience (3.0)
Prerequisite: Consent of instructor or program director.
Survey of the neural and physiological factors which influence behavior.

PSYC 643 Principles of Neuroscience (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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.

PSYC 655 Law and Psychology (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
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 (3.0)
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 (1.0-3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
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 (1.0-6.0)
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 (3.0)
Prerequisite: Consent of instructor.
Survey in depth of current theories, practice, and research in selected areas relevant to clinical psychology.

PSYC 689 Clinical Psychopathology (3.0)
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 (1.0)
Guidance and training in college teaching of undergraduate psychology courses.

PSYC 691 Program Evaluation (2.0-3.0)
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 (1.0)
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 (1.0)
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.

PSYC 694 Supervision Practicum (1.0)
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 (3.0)
A review of current diagnostic and therapeutic techniques used by clinical psychologists in treating children. Spring.

PSYC 697 Psychotherapy Research (3.0)
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 (1.0-12.0)
Prerequisite: Satisfactory completion of preliminary examination and permission of dissertation director.

PSYC 702 Advanced Topics in Psychology (3.0)
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 (1.0-10.0)
Prerequisite: Clinical psychology program.
Experience in clinical psychology in professional settings under the supervision of professional clinical psychologists.

Sociology

SOC 500 Special Topics (3.0)
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 503 Political Sociology (3.0)
Focuses on the theoretical and empirical issues pertaining to the relationship between political processes, political structures, the state, and society.

SOC 508 Social Networks: Concepts, Techniques, and Applications (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0-6.0)

SOC 601 Topical Seminar in Sociology (3.0)
An exploration of a specific topic or problem area of importance in contemporary sociology.

SOC 602 Independent Study (Readings) (1.0-5.0)

SOC 603 Independent Study (Small-Scale Research Problem) (1.0-5.0)

SOC 604 Proseminar in Sociology (1.0)
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 (3.0)
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 (3.0)
Intensive review of research design, instrumentation, survey procedures, data collection and processing techniques, analysis, and report writing.

SOC 616 Advanced Multivariate Modeling (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
Advanced study of the historical, cultural, structural, and social-psychological factors affecting human sexual expression.

SOC 640 Seminar in Urban Sociology (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
A cross-cultural study of criminal behavior with special emphasis on crime causation.

SOC 670 Seminar in Advanced Demography (3.0)
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 (3.0)
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 (3.0)
Current and historical issues in race, racism, and ethnicity. Focus on U.S. with reference to other societies.

Sport Administration

SPAD 505 Sport Facility Management (3.0)
Prerequisite: Admission to the College of Education and Human Development or the 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 (3.0)
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 (1.0-3.0)
Prerequisite: Consent of instructor.

SPAD 529 The American Woman in Sport (3.0)
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 (1.0-3.0)
Prerequisite: Consent of instructor.
Selected projects of interest to sport administration faculty.

SPAD 604 Financial Principles of Sport (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
A theoretical analysis of the American team sports industry, with particular emphasis upon management decisions and business objectives.

SPAD 625 Sport Administration (3.0)
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 (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Selected projects of interest to sport administration faculty.

SPAD 680 Athletics and Higher Education (3.0)
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 (3.0)
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 (3.0)
Trends and issues of importance to the practitioner in sport administration.

SPAD 685 Case Studies in Sport Administration (3.0)
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 (3.0)
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 (1.0-3.0)
Prerequisite: Twenty-one hours completed toward a degree, six hours in SPAD and consent of instructor.
Note: Cross-listed with SPAD 592.
Supervised practical work experience in an organization or business related to student's academic field, area of specialization, or career interest. Students enrolled in class must work a minimum of 135 hours at their internship site.

SPAD 699 Directed Readings in Sport Administration (1.0-3.0)
Prerequisite: Fifteen graduate hours and consent of sport administration instructor.
Supervised readings and written project relating to a specific research topic in physical education.

Spanish

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 (1.0-15.0)
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 506 Main Currents in Spanish-American Literature II (3.0)
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).

SPAN 511 Studies in Spanish Medieval Literature (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Intensive study of significant works of the Spanish Golden Age.

SPAN 516 Literary Influences in Nineteenth-Century Spanish (3.0)
Prerequisite: Consent of instructor.
Study of significant writers of the Spanish Romantic, Realistic, and Naturalistic periods.

SPAN 517 The Introspective Generation (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Study in depth of significant works of the Post-Civil War period.

SPAN 519 Studies in Latin American Contemporary Literature (3.0)
Prerequisite: Consent of instructor.
Intensive study of significant works from contemporary Latin America.

SPAN 522 Spanish Phonetics and Diction (3.0)
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 525 Spanish for the Classroom Teacher (3.0)
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 527 Latin American Literature: Colonial Period through 19th Century (3.0)
Prerequisites: SPAN 355, 403 or 404 and permission of instructor.
Study of significant literary works from the Colonial Period through 19th Century.

SPAN 528 Contemporary Spanish-American Theatre (3.0)
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 (3.0)
Prerequisite: Writers of the Hispanic World (SPAN 355).
Selected Spanish American poets, movements and national traditions. Critical methodological theory.

SPAN 530 Spanish American Narrative (3.0)
Selected Spanish American novelist and short story writers, movements and national traditions. Critical methodological theory.

SPAN 561 Independent Study (1.0-3.0)
Prerequisite: Consent of department.
Independent study in areas not covered in the regular curriculum.

SPAN 599 Special Topics (3.0)
Prerequisite: Consent of instructor.
Topics of a unique or specialized nature in Spanish language, literature or culture.

SPAN 621 History of the Spanish Language (3.0)
Prerequisite: Consent of instructor.
Evolution of the Spanish language from earliest times to present. Linguistic analysis of representative literary and non-literary texts.

SPAN 624 Spanish Applied Linguistics (3.0)
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 (3.0)
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 (3.0-6.0)

Social Work

SW 601 Life Span: Human Development (3.0)
Provides information related to theories and concepts of human behavior that are necessary for skill development in a contextually appropriate way. Client populations are examined and analyzed in their unique contexts with an emphasis on diverse developmental experiences.

SW 602 Social Welfare Institutions, Policies and Institutions (3.0)
Explores the history of social welfare in light of dominant values and contextual factors that shape the definition of social problems and their solutions. Relationships between disenfranchised populations and social welfare policies will be stresses and particular attention will be paid to institutional racism, sexism, classism, heterosexism, anti-Semitism, and ageism.

SW 603 Human Diversity (3.0)
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 (3.0)
Prerequisites: Concurrent registration in SW 670.
Foundation generalist practice course that provides an introduction to the knowledge, principles, values, and skills necessary for social work practice. The approach is that of structural social work that focuses on client strengths.

SW 605 Social Work Practice II (3.0)
Prerequisites: Successful completion of SW 604 and concurrent registration in SW 671.
Enables the student to know and understand social work intervention with individuals, families, groups, and organizations from a community perspective. Various models of community organization will be studied along with the different skills and roles that the social woker will need to internalize and then impart.

SW 619 Human Transactions in the Social Environment (3.0)
Prerequisites: Successful completion of SW 601
Provides students with yhe knowledge and conceptual frameworks needed to analyze the social, institutional, and cultural environments in which human behavior occurs. Central content deals with communities, organizations, groups, and families as social entites and the role relationships that characterize them as being dynamic and able to interact and create change.

SW 622 Issues in Policy and Service Delivery (3.0)
Prerequisites: Successful completion of SW 602
Emphasizes the interrelationship between problem conceptualization, policy options, and their impact on social work practice and clients. Students will analyze these interrelationships in various policy areas (e.g. child welfare, health, mental health, aging, criminal justice) and will analyze fom a systems perspective, a policy and delivery system of their choice. Current social services programs will also be reviewed.

SW 625 Children and Families (3.0)
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 (3.0)
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 social work practice and for evaluating service delivery in all areas of practice. Content on ethical standards of scientific inquiry, qualitative and quantative research methodologies, data analysis and statistical procedures, and the evaluation of practice.

SW 633 Human Sexuality and Treatment of Sexual Dysfunction (3.0)
Prerequisite: Successful completion of all foundations content.
Provides knowledge about human sexuality. It explores the cultural context of sexuality, normal and abnormal sexual functioning, and the treatment of sexual dysfunction.

SW 636 Death & Grief (3.0)
Prerequisite: Successful completion of all the foundation content.
Taught from the perpective that death is a natural part of the life process. Explores death, dying, and grief from a biopsychosocial approach. The physical part of dying death is explored from a biological perspective as well as from a social and psychological perspective. The views of the dying person are juxtaposed against societal beliefs about death and the views of those who are left are analyzed in terms of grieving as a process.

SW 639 Crisis Intervention (3.0)
Prerequisite: Successful completion of all the foundation content.
Constructs and principles of crisis theory are analyzedin light of their pragmatic application with clients in crisis.Students use complex case analysis in their application of theory to practice. Taught from a strengths perspective and using a narrative approach, this class emphasizes a client-centered perspective.

SW 640 Advanced Direct Practice I (3.0)
Prerequisites: Successful completion of SW 605 and concurrent registration in SW 672.
Provides students with a framework for practicing narrative collaboration and using it simultaneously with structural social work. Students learn to help people resolve problems by separating their lives and relationships from oppression by helping them re-author their lives with alternative, emancipatory narratives. There is an emphasis placed on engaging persons in transformational conversations by formulating and using generative questions.

SW 641 Advanced Direct Practice II (3.0)
Prerequisite: Successful completion of SW 640 and concurrent registration in SW 673.
Students learn to think about and approach metawork-the work about work-from the narrative collaboration perspective. Using a framework of analytical dimensions, students learn to analyze and deconstruct current practices (including their own) and how to supervise and teach other practitioners to develop basic understanding and skills in helping people. Students learn to practice narrative collaboration with families and groups, and to modify application of principles derived from narrative practices for work with diverse populations.

SW 642 Psychopathology (3.0)
Focuses on the clinical use of diagnostic classification of psychopathology while preparing students for clinical work. This course is taught with a social work perspective that incorporates associated concepts of labeling theory and strengths perspective.Restricted to Kent School Students.

SW 651 Foundations of Family Therapy (3.0)
Course content includes critical elements of family systems including basic concepts and an intergrative approach to marriage and family therapy. Approaches highlighted are systems theory, communication theory, developmental theory, and critical theory in light of their historical influence upon the field. Case-based discussions highlight clinical concerns through relational observations and analysis.

SW 657 Group Methods (3.0)
Prerequisite: Successful completion of all the foundation content.
All major aspects of group life are explored and there is an emphasis on the purposes, content, and forms of various group experiences. The social worker's role in facilitating the group process is detailed and there is a special emphasis placed on the beginning processes associated with group methods.

SW 659 Introduction to Family Therapy Practice (3.0)
Prerequisites: Successful completion of SW 601, SW 602, SW 619, SW 622.
This course is required of those in the Marriage and Family Therapy program. This course may be taken as an elective by MSSW students.
The course content of this introductory course in marriage and family therapy examines knowledge, skills, and values associated with the beginning phases of the therapeutic process. A review of the theoretical influences on the practice of marriage and family therapy is included as well as observing and practicing basic skills. By the conclusion of the course, students are expected to demonstrate competence in these basic processes.

SW 662 Substance Abuse (3.0)
Prerequisite: Successful completion of SW 601, SW 602, SW 619, SW 622.
Examines current issues associated with substance abuse. Prevailing paradigms related to substance abuse are explored and pragmatic intervention strategies for dealing with those abusing substances are presented and applied.

SW 664 Social Work and the Law (3.0)
Legal principles and issues important to social workers: constitutional law, civil rights, family and children, administrative law and malpractice.

SW 665 Supervision, Training, and Consultation (3.0)
This course focuses on concepts of learning, competence, motivation and growth. Instructing in group and one to one considered.

SW 667 Negotiation and Bargaining (3.0)
Prerequisite: Successful completion of SW 601, SW 602, SW 619, SW 622.
Principles associated with successful negotiating and bargaining are analyzed and applied through the use of meditation techniques. Through personal experience, students learn specific skills associated with mediating successful negotiations.

SW 668 Advanced Research Practice I (3.0)
Prerequisites: Completion of SW 626. Restricted to Kent School students.
Prepares students to examine and evaluate their practice using mutiple 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 (3.0)
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 670 Social Work Practcum I (3.0)
Prerequisite: Concurrent registration in SW 604.
Designed to provide an educationally supervised practicum within a human service agency. This generalist fieldwork experience is based on the structual/strengths model of social work practice and integrates class assignments in SW 604 with the field experience.Provides the student an opportunity to begin to apply theory from all foundation level courses topractice in a structured setting.

SW 671 social Work Practicum II (3.0)
Prerequisite: Successful completion of SW 604, 670, and concurrent registration in SW 605.
Building on the knowledge, skills and values developed in SW 670, this foundation field experience further develops opportunities for students to gain more experience in applying generalist roles, continuing in the same field based setting.

SW 672 Advanced Social Work Practicum III (3.0)
Prerequisites: Satisfactory completion of all foundation level courses or admission to Advanced Standing and concurrent registration in SW 640 or SW 691.
Builds on the foundation generalist practicum and all the foundation courses. It continues to develop the students' skills, knowledge, and values associated with the structural/strengths model of social work. Focuses on the application of advanced theory, knowledge and skills as covered across the advanced curriculum.

SW 673 Advanced Social Work Practicum IV (3.0)
Prerequisite: Successful completion of SW 672 and either SW 640 or SW 691 and concurrent registration in SW 641 or SW 692.
Building on the previous semesters of learning, this course provides a final opportunity for students to integrate the specialized competencies developed across the MSSW curriculum.Students use advanced level research techniques and knowledge to access and evaluate interventions, and SW 673 is the summative specialized practice experience.

SW 681 Social Gerontology (3.0)
Examinaton of the field of aging for social work practice.

SW 682 Social Work Practice with Older Persons (3.0)
Emphasis on methods and techniques for social work practice with older persons.

SW 685 Planning and Community Development (3.0)
Intergrates social science and social work theories in developing conceptional and practice base in social planning and community development.

SW 691 Advanced Macro Practice I: Supervision, Training and Program Design/Evaluation (3.0)
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 (3.0)
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.

Doctoral Program

SW 701 Family Therapy Applications (3.0)
Prerequisites: SW 651 and SW 659.
Applications of Marriage and Family Therapy to difficult problems. Integrative, research-based and narrative approaches are studied to emphasize theories of relationships and theories of change. Psychopathology and the DSM IV are studied in light of current research, theory, and practice.

SW 702 Professional Issues and Ethics (3.0)
Prerequisites: Admission to the Family Therapy Program.
Correct professional issues in the field of marital and family therapy will be studied with an emphasis on family law, ethics, professional standards, and national trends.

SW 703 Couple Therapy Theory and Practice (3.0)
Prerequisites: Admission to the Family Therapy Program.
Major theoretical approaches to couple therapy. Emphasis on marriage counseling, marital enrichment, divorce and remarrige.

SW 704 Integating Family Therapy: Theory and Practice (3.0)
Prerequisites: Admission to the Family Therapy Program.
Examines integrative models of family systems therapy. Personal models of integration will be encouraged.

SW 705 Family Therapy Practice I (1.0-5.0)
Prerequisites: Admission to the Family Therapy Program.
Students will work with a wide variety of families and family problems in community agency settings. Maximum of thirteen hours. Pass/Fail Grading.

SW 706 Family Therapy Practice II (1.0-5.0)
Prerequisites: Admission to Family Therapy Program.
Continuation of clinical experience. Students may change clinical settings, populations, and/or supervisors. Maximum of 10 hours. Pass/Fail grading.

SW 707 Special Topics in Family Therapy (1.0-3.0)
Prerequisites: Admission to the Family Therapy Program.
Special topics in marital and family therapy. Topic will be indicated in the term schedule.

SW 708 Independent Study in Social Work (1.0-4.0)
Prerequisite: Successful completion of the foundation content and permission of the instructor.
The student will be required to submit a proposal for investigating some area or problem in social work not ordinarily offered in the social work program or the marital and family therapy program. The report of the student's study will be presented in a written report.

SW 751 Social Work Research I: An Overview (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (3.0)
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 (1.0)
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 (3.0)
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 (1.0)
Prerequisite: Professional Seminar I
Continuation of Professional Seminar I

SW 759 Human Behavior and Change Theories in Social Work Practice (3.0)
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 (3.0)
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 762 Research Practicum (3.0)
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 (3.0)
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 (3.0)
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 765 Qualitative Inquiry SW (3.0)
Interpretive approaches to systematic inquiry that contrast with the natural science model of social research will be critically examined, focusing on classic and contemporary theories to understand and interpret the social world and the role of qualitative methods in the study and improvement of people's lives. The first part of the courses focuses on qualitative inquiry from the multiple disciplines' views, and the second part examines qualitative inquiry from the social work perspective.

SW 766 Doctoral Preparation (3.0)
Students will be prepared for doctoral studies in Social Work. They will recall the basics of sampling and research designs, power analysis, levels of data, composite indicators, reliability and validity, units of analysis, constructing instruments, codebooks, and using the Statistical Package for the Social Sciences (SPSS).

SW 767 Non-Parametric Statistics for Social Work (3.0)
The goal of the course is to understand and be able to apply non-parametric statistical techniques and tests to data generated in social work research. The student will be expected to develop/analyze research designs and to execute statistical tests in which non-parametric procedures are appropriate. The course will cover designs and statistical methods in the following areas: 1 Single-sample cases 2 One sample, two measures or paired replicates 3 Two independent samples 4 k related samples 5 measures of association.

SW 768 Scale Development (3.0)
Standardized instruments are used to systematically assess client problems and evaluate client progress in social work practice, and social work researchers are often called upon to develop new scales to access and evaluate client systems, their environments and the interaction between them. Doctoral level social workers must be able to develop new standardized measures or to improve existing ones in order to respond effectively to the needs of assessment and evaluation posed by social work practice and research.

SW 797 Independent Study (3.0-12.0)
Independent studies for doctoral students.

SW 798 Special Topics in Social Work (3.0-12.0)
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 (1.0-18.0)
Prerequisite: Satisfactory completion of the qualifying examination and permission of dissertation director.
Research on dissertation project.

Theatre Arts

TA 515 Topics in Advanced Speaking English as a Second Language (3.0)
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 (3.0)
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 Stage Movement I (3.0)
Prerequisite: Consent of instructor.
Development of physical expressiveness and agility for the stage. One section each semester.

TA 522 Stage Movement II (3.0)
Refer to: TA 521

TA 523 Stage Speech I (3.0)
Prerequisite: Consent of instructor.
Development of voice production and articulation for the stage. One section each semester.

TA 524 Stage Speech II (3.0)
Refer to: TA 523

TA 525 Advanced Studies in Acting (1.0-3.0)
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 (3.0)
Prerequisite: Senior standing or faculty consent.
Organization of commercial theatre, auditioning techniques, and employment possibilities.

TA 530 Directing Workshop (3.0)
Prerequisite: TA 330 or TA 323 and permission of instructor.
3 lecture, 1 lab.
Practical problems in the art of directing approached in a laboratory setting. Meets with 520.

TA 531 Advanced Directing (3.0)
Prerequisite: Consent of instructor.
The techniques of directing the major play, including artistic, organizational, and budgetary problems.

TA 533 Stage Management (3.0)
Prerequisite: Consent of instructor.
Techniques of production management during audition, rehearsal, and performance. Practical project required. Spring.

TA 540 A-E Problems in Technical Theatre (3.0)
Prerequisite: TA 241.
A. Welding
B. Sound Design
C. Technical Direction
D. Special Topics

TA 541 Topics-Scene Design (3.0)
Prerequisite: TA 340.
A. Scene Design
B. Advanced Scene Design
C. Design for the Camera
D. Design for Lyric Theatre
E. Special Topics

TA 543 A-C Scenographic Techniques (3.0)
Prerequisite: TA 340.
A. CAD for Stage Design
B. Sketching & Rendering -Scenery
C. Scenic Painting
D. Special Topics

TA 545 Topics-Costume Design (3.0)
Prerequisites: TA 345.
A. Costume Design
B. Costume History
C. Costume Construction
D. Sewing Techniques
E. Sketching & Rendering -Costumes
F. Special Topics

TA 546 Advanced Stage Makeup (2.0)
Prerequisite: Consent of instructor.
Advanced techniques of design and execution of makeup for the stage. Fall.

TA 549 Topics- Lighting Design (3.0)
Prerequisites: TA 349.
A. Lighting Design
B. Advanced Lighting Design
C. Special Topics

TA 550 Theatre Practicum (1.0-3.0)
Prerequisite: 3 credits in TA 350 or graduate standing.
Practical work in theatre performance and production. Pass-fail. A maximum of 6 credits in 350 and 550 may be counted toward the B.A. degree.

TA 555 Special Topics in Theatre (1.0-3.0)
Prerequisite: Consent of instructor.
Advanced study of specific areas of theatre arts. May be repeated.

TA 560 Directed Study in Theatre History (3.0)
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 (3.0)
Prerequisites: Graduate standing or permission of instructor.
Note: Alternate spring semesters.
The theatre and drama of Japan, China, and other Asian nations.

TA 571 Playscript Interpretation (3.0)
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 (3.0)
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 (1.0-6.0)

TA 620 Performance Theory (3.0)
Prerequisite: Consent of instructor.
Historical study of major approaches to the aesthetics of acting and directing. Alternate springs.

TA 622 Graduate Movement I-IV (3.0)
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 (3.0)
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 (3.0)
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 (1.0-3.0)
Prerequisite: Consent of instructor.
Practical projects in theatre performance (acting, directing, stage management).

TA 640 Design Theory (3.0)
Prerequisite: Consent of instructor.
Historical study of major approaches to the aesthetics of theatrical design. Alternate springs.

TA 641 Color Theory (3.0)
Study of the physical and psychological properties and effects of color. Alternate springs.

TA 645 MFA Production Project (1.0-3.0)
Prerequisite: Consent of instructor.
Practical projects in theatre production (design, technical theatre, theatre management).

TA 650 Theatre Internship (1.0-12.0)
Prerequisite: Approval of department and host organization.
An internship with professional arts organizations.

TA 655 Independent Study (1.0-3.0)
Independent study in areas not covered by the regular graduate curriculum.

TA 656 Directed Readings in Theatre (3.0)
Prerequisite: 24 graduate hours in theatre arts.
Readings in preparation for the M.A. comprehensive examination. Pass/Fail grading.

TA 661 Approaching Period Drama (3.0)
Prerequisites: Consent of instructor.
Combines theoretical approaches and practical methods of performing, designing, staging and teaching period drama.

TA 662 Approaching Realistic Drama (3.0)
Prerequisites: Consent of instructor.
Combines theoretical approaches and practical methods of performing, designing, staging, and teaching realistic drama.

TA 663 Approaching Antirealistic Drama (3.0)
Prerequisites: Consent of instructor.
Combines theoretical approaches and practical methods of performing, designing, staging, and teaching antirealistic drama.

TA 664 Approaching African American Theatre (3.0)
Theoretical approaches and practical methods of performing, designing, staging and teaching theatre, literature, and art that springs from an afrocentric perspective. Designed to prepare students to integrate African-American topics into their teaching and to collaborate successfully as artists.

TA 670 Dramatic Theory and Criticism (3.0)
Prerequisite: Consent of instructor.
Historical study of major approaches to the aesthetics of theatre and drama. Alternate springs.

Urban and Public Affairs

UPA 602 Urban Policy and Goverance (3.0)
A study of urban policy and its impacts upon cities and particular segments of the population. Emphases the content, evolution, and consequences of national urban policy. Examines centralization and decentralization of metropolitan government, intergovernmental systems, and their relationship to policy implementation.

UPA 603 Urban Economics (3.0)
Prerequisites: PLAN 500, ECON 500, or consent of instructor.
Note: Crosslisted with PADM 640, ECON 605, and PLAN 603.
Application of economic theory to urban policy issues including metropolitan development and job creation, poverty, crime, transportation, environment, spatial structure, and other issues.

UPA 606 Research Methods (3.0)
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.

UPA 610 Urban Theory and Public Affairs (3.0)
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 621 Policy Analysis and Program Evaluation (3.0)
Note: Crosslisted with PADM 603.
The course describes techniques of practical program evaluation as well as the institutional context of policy formulation, adoption, implementation, and evaluation. Process evaluation, qualitative approaches, outcome monitoring, natural experiments, quasi-experiments, ratings, use of expert judgment, surveys, role-playing, and focus group topics are covered. The course also describes theories of policy making, the policy environment, agenda setting and decision making.

UPA 623 Comparative Urban Development (3.0)
Note: Crosslisted with PADM 623.
Examines urban development in a cross national perspective. Traces the formulation, strategy and implementation or management of urban development policy in a number of nations. While the emphasis is on North America and West Europe, the lessons have broader relavence for other parts of the world, and will be applied to developing areas.

UPA 624 Economic Conditions and Forecasting (3.0)
Prerequisites: ECON 600 or ECON 605/ UPA 603/ PLAN 603/ PADM 640.
Note: Crosslisted with PLAN 628 & ECON 620.
Develops quantitative tools for the analysis & forecasting of economic phenomena. Both structural & time models are presented. Basic Econometric methods are used to fit models & evaluate their forecasting properties.

UPA 625 Macroeconomic Theory (3.0)
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 627 Decision Models (3.0)
Cost-benefit analysis and the design and use of probability models for dealing with complex decision-making in situations involving uncertainty.

UPA 628 Microeconomic Theory (3.0)
Prerequisites: ECON 500/ PLAN 500.
Note: Crosslisted with ECON 660.
A thorough examination of the theory of household and firm. Determination of price under different market structures.

UPA 629 Geographic Information Systems (3.0)
Prerequisites: Consent of instructor.
Note: Crosslisted with GEOG 657 & PLAN 608.
Application of GIS to real world projects. An emphasis will be placed on the development of a digital spatial database.

UPA 630 Politics of Urban Policy (3.0)
A study of how urban policy is formed at national, state, and local levels. The role of power is explored as an instrument in policy making.Examines how interest groups interact with government as well as the parts played by pro-growth and anti-growth coalitions.

UPA 632 Independent Study (1.0-6.0)

UPA 640 Economic Development (3.0)
Crosslisted with: PADM 645.
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 646 Urban and Public Finance (3.0)
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 Public Budgeting and Finance (3.0)
Note: Crosslisted with PADM 604 & PLAN 609.
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.

UPA 648 Housing (3.0)
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 (3.0)
Crosslisted with PADM 621.
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 (3.0)
Crosslisted with PADM 625.
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 and Organizational Theory
Public Aministration and Organizational Theory (3.0)
Note; Crosslisted with PADM 600, PLAN 613, & POLS 625.
Basic principles of public administration, with analysis of problems of bureaucracy, organization, financial management and public policy.

UPA 662 Administrative Law and Processes (3.0)
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 667 Human Resources Management
Human Resources Management (3.0)
Note: Crosslisted with PADM 642 & PLAN 611.
Basic theories, public policies, laws, regulations, problems, and prospects of human resource development and management within the context of the public sector.

UPA 672 Strategic Management and Planning (3.0)
Note: Crosslisted with PADM 605 & PLAN 610.
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 678 Land Use and Planning Law (3.0)
Note: Crosslisted with PADM 688, PLAN 605.
Examination of pertinent legal issues, including ordinances, state and federal legislation, and court rulings, impinging on planning and land use activities.

UPA 679 Environmental Policy (3.0)
Note: Crosslisted with PADM 627, PLAN 620.
Survey of environmental issues and policies designed to address those issues.

UPA 680 Special Topics in Urban and Public Affairs (1.0-6.0)
An advanced study of one or more selected topics or issues related to the study of Urban and Public Affairs.

UPA 682 Urban Design (3.0)
2 lecture, 1 field work.
Note: Crosslisted with PLAN 622 & PADM 622.
Covers theories, principles, and processes of urban design, including applications to actual design problems.

UPA 683 Land Use Planning (3.0)
Note: Crosslisted with PLAN 607.
This course provides an understanding of the history and current characteristics of land use planning and policy. Topics include the comprehensive plan, regulatory controls such as zoning, fiscal mechanisms of control, land use and environmental disputes, regional planning and growth management.

UPA 684 Planning Theory (3.0)
Note: Crosslisted with PADM 607 and PLAN 601.
In-depth examination of urban and regional planning theory, with a special focus on the rational comprehensive model.

UPA 687 Environmental Policy and Natural Hazards (3.0)
Note: Crosslisted with PADM 630 & PLAN 623.
Explores the relationship of environmental policy and planning with natural hazards and disasters, with an emphasis on preparation for and mitigation of impacts.

UPA 690 Urban Transportation Planning (3.0)
Prerequisites: ECON 605, PADM 640, PLAN 603 or UPA 603.
Note: Crosslisted PLAN 624.
Analysis of characteristics and costs of existing and inovative urban transportation systems. Role of planning methods in estimating transportation usage and chosing optimal plans.

UPA 696 Urban Infrastructure (3.0)
Note: Crosslisted with PLAN 621.
Planning, financing, implementation and operation of urban infrastructure systems.

UPA 700 Dissertation Research (1.0-12.0)
Prerequisite: Permission of program advisor.

Visual Sciences

VISC 601 Principles of Visual Sciences I (3.0)
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 (3.0)
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 (1.0-12.0)
Prerequisite: Consent of instructor.
Research in ophthalmology and visual sciences.

VISC 611 Topics in Ophthalmology or Visual Science (1.0-3.0)
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 (1.0)
Oral presentation of topics in ophthalmology and visual sciences.

VISC 614 Dissertation Research (1.0-6.0)
Research related to doctoral dissertation.

VISC 615 Current Topics in Glaucoma Research (3.0)
Prerequisite: Graduate of medical biochemistry, physiology and pharmacology, or consent of instructor.
Oral presentations relating to glaucoma research.

VISC 616 Mechanisms of Ocular Inflammation (2.0)
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 (3.0)
Prerequisite: Advanced Cell Biology
Discussion of current research in retinal cell biology.

VISC 618 Physiology of Avascular Tissues (3.0)
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 (2.0)
Prerequisite: Consent of course director.
Methods of studying receptors, physiology of paracrine and autocrine hormone receptors and their transduction processes.

VISC 620 Glaucoma (3.0)
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 (3.0)
Prerequisite: Consent of instructor.
Eicosanoid receptors and role of these compounds and receptors in physiology and pathophysiology.

VISC 667 Advanced Cell Biology (3.0)
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

WMST 500 Senior Seminar in Women's Studies (3.0)
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 (3.0)
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. (3.0)
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 (3.0)
The course 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. The course also concerns the interaction of gender, race, and class.
HIST 211-212 is recommended. Credit may not be earned for this course and HIST 589. (Social Sciences)

WMST 535 Women's Health Issues (3.0)
Note: Cross-listed with HPES 564
A study of the sociological, psychological and physiological factors that influence women's health.

WMST 540 Women's Health in Africa (3.0)
Prerequisites: PAS 200 and faculty consent.
Examination of population growth, early marriage, family size and cultural and religious befiefs on reproductive health of contemporary African women. (Social Sciences)

WMST 556 Feminist Theory (3.0)
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 in Developing Countries (3.0)
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. (Social Sciences)

WMST 571 Francophone Women Writers (3.0)
Prerequisite: Faculty consent.
Note: Cross-listed with ML 506.
Readings of literary and non-literary texts by women of the French speaking world.

WMST 590 Independent Study: Women's Studies (1.0-3.0)
Prerequisite: Consent of instructor and junior standing.
Provides opportunity for a student to do advanced interdisciplinary work on a Women's Studies topic.

WMST 591 Topics in Women's Studies (3.0)
Prerequisite: Consent of instructor.
Provides advanced study of a special topic related to women or gender from an interdisciplinary perspective.

WMST 592 Topics in Women's Studies (3.0)
Prerequisite: Junior standing or faculty consent.
Provides advanced study of a special topic related to women or gender from an interdisciplinary perspective.

WMST 690 Independent Study: Women's Studies (1.0-3.0)
Prerequisites: Consent of instructor.
Provides opportunity for a graduate student to do advanced interdisciplinary work on a Women's Studies topic.

WMST 691 Advanced Topics in Women's Studies (3.0)
Prerequisites: Consent of instructor.
Provides advanced study of a special topic related to women or gender from an interdisciplinary approach.

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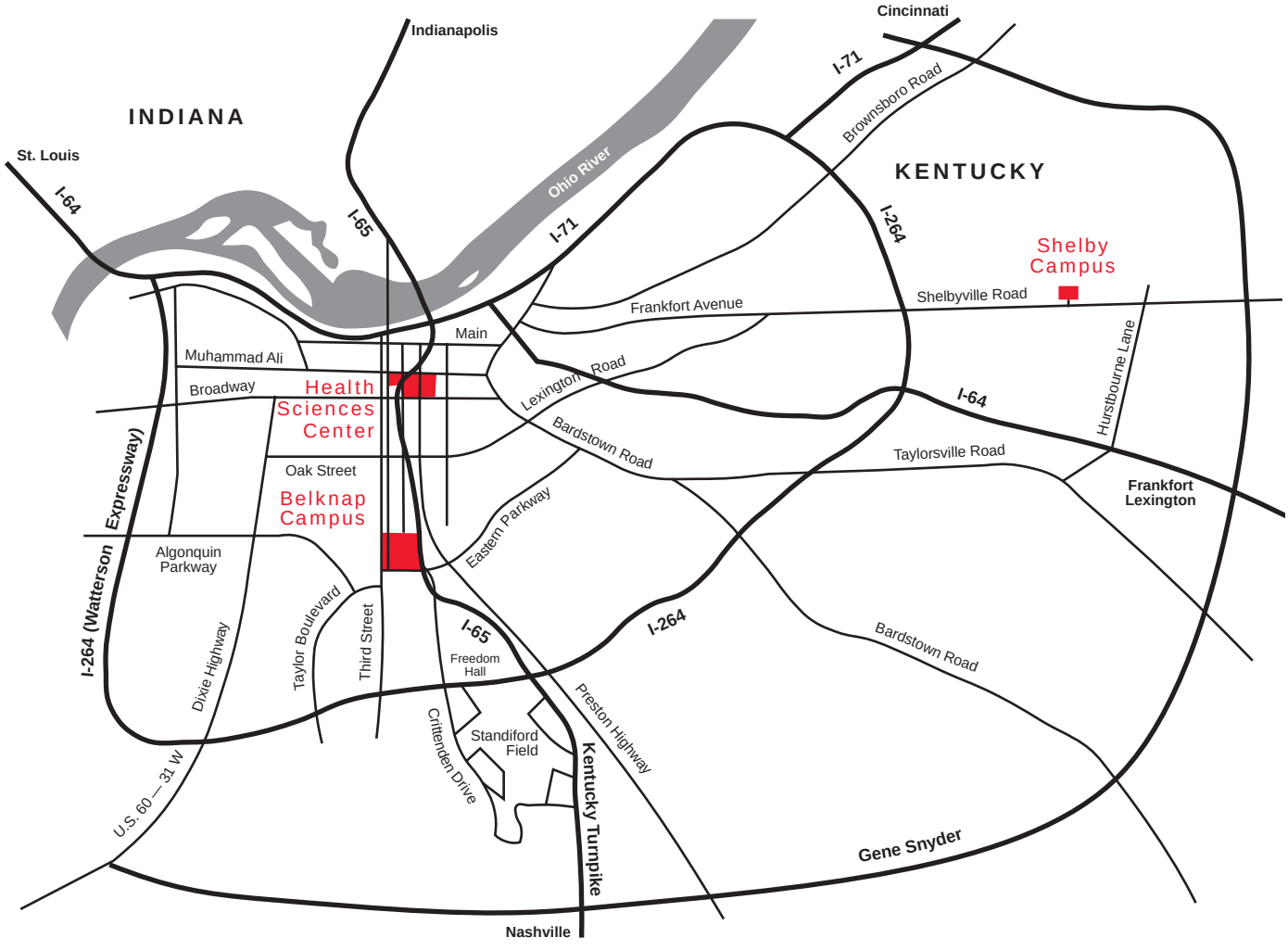
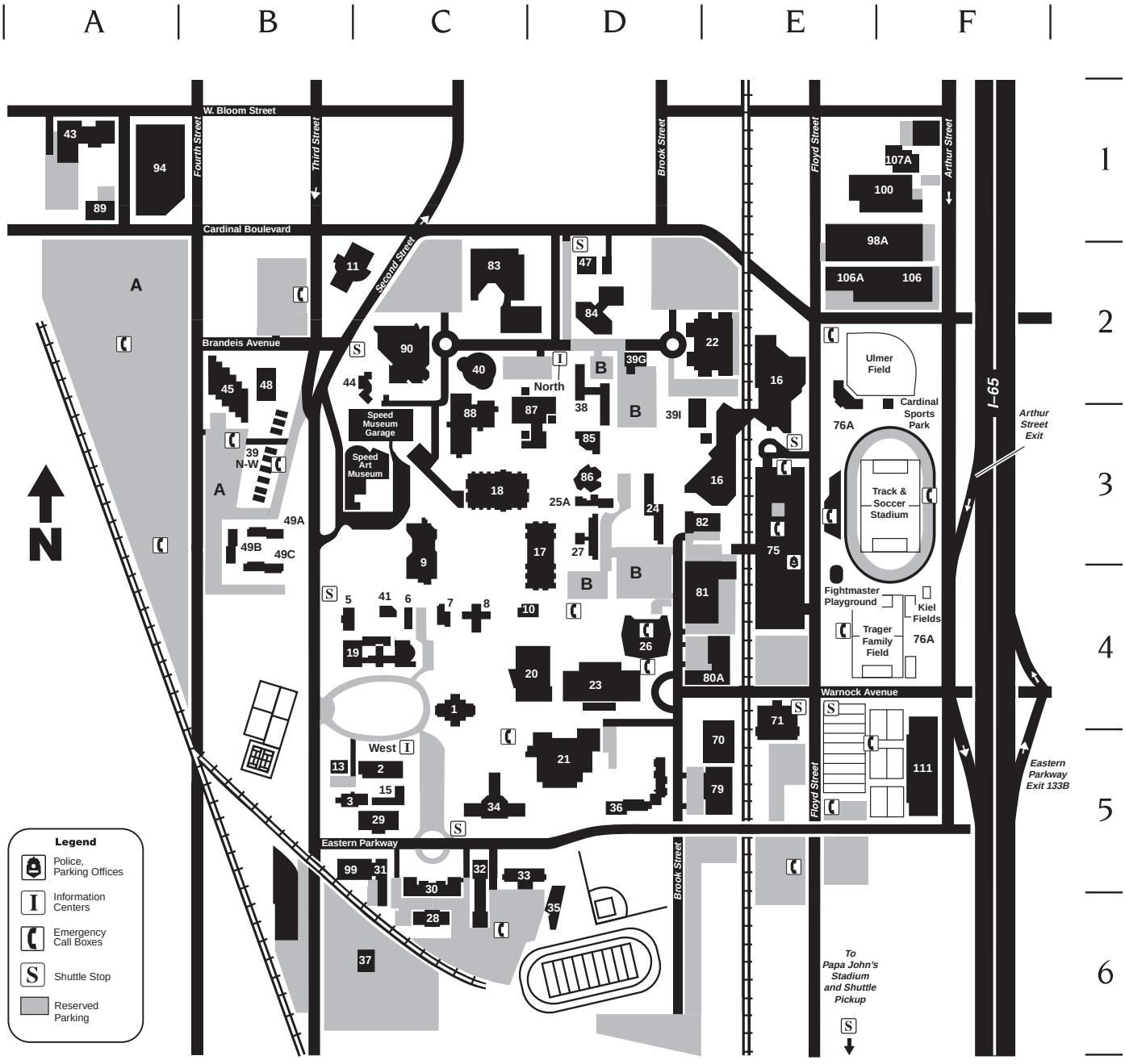
U of L Campuses



Louisville and Jefferson County

U of L Campuses

Belknap Campus

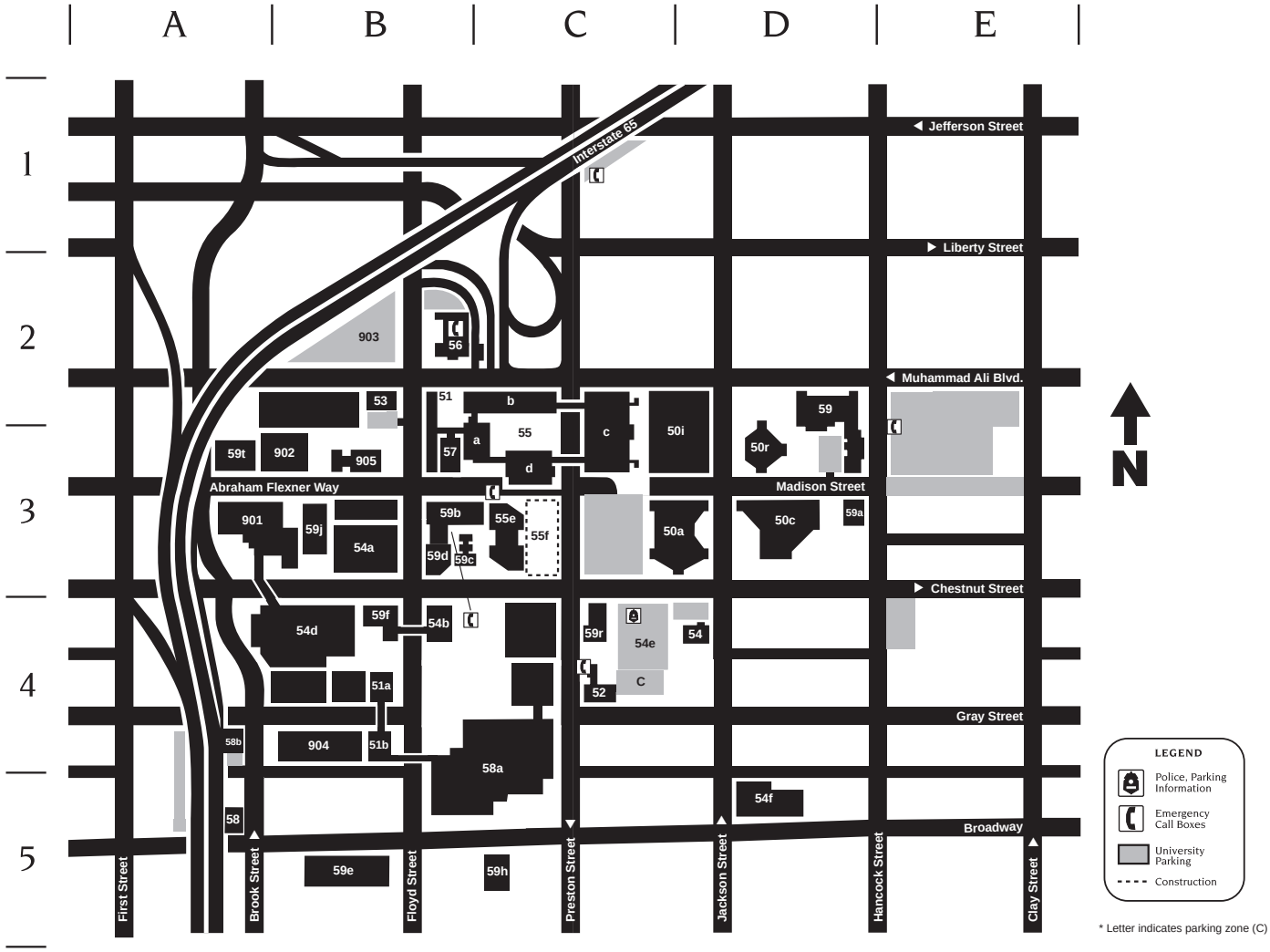


Building Index

Note: Letters/numbers represent grid location. Numbers in parentheses represent official building
.

**Not indicated on map

Health Sciences Center



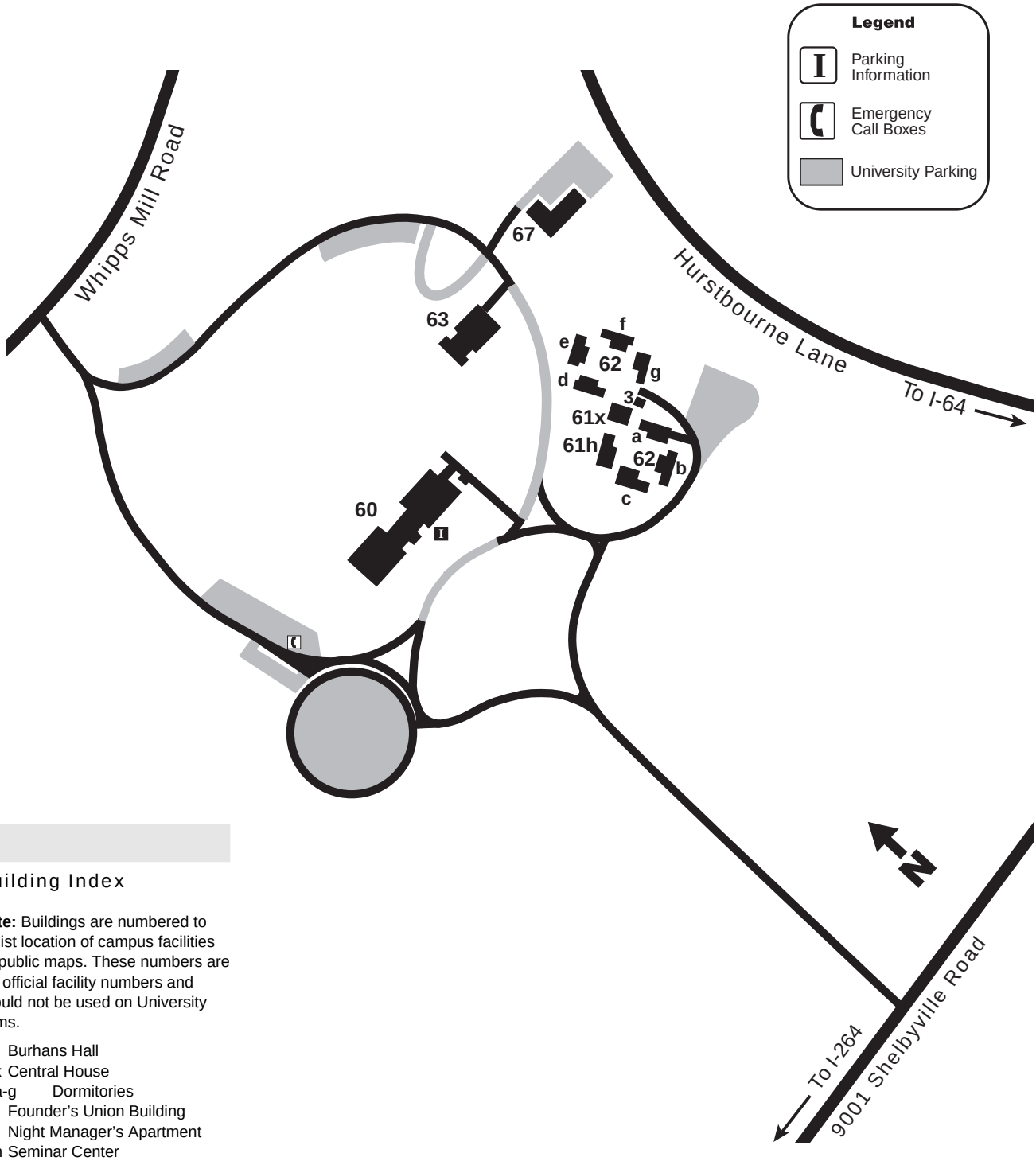
* Letter indicates parking zone (C)

Building Index

Note: Letters/numbers represent grid location. Numbers in parentheses represent official building numbers.

3B Abell Administration Center (59c)
3B Allied Health Sciences, School of (59b)
3C Ambulatory Care Building/ University Physicians Group (50a)
4A Arthur H. Keeney House (58b)
3C Baxter Biomedical Research Building (55e)
3C Baxter Biomedical Research Building II (under construction) (55f)
2D Carmichael Building (59)
4C Chestnut Street Parking Structure (54e)
4B Children's Hospital Foundation Building (54b)
3C Dentistry, School of (55c)
3B Frazier Rehab Institute (59j)
2C HSC Instructional Building (55b)
3D James Graham Brown Cancer Center (50r)
3A Jewish Hospital Rudd Heart and Lung Center (59t)
3A Jewish Hospital (901)
3B Jewish Hospital Outpatient Care Center (902)
2B Jewish Hospital Parking Garage (903)
2B Jewish Hospital Cardiovascular Research Center (53)
4D Keller Child Psychiatry Research Center (54)
2B Kentucky Lions Eye Center (56)
4C Kidney Disease Program (59r)
3C Kornhauser Library and Commons Building (55d)
3B Kosair Children's Hospital (54a)
3B Kosair Charities Pediatric Center (59d)
3D Lampton Building (59a)
4C Medical-Dental Apartments (52)
2B Medical-Dental Research Building (51)
4B Medical Towers, North (51a) and South (51b)
3C Medicine, School of (Research Tower) (55a)
5A Myers Hall (58)
3C Norton Healthcare 224 E. Broadway Building (59e)
4B Norton Healthcare Gray Street Professional Building (904)
4C Norton Healthcare Pavilion (58a)
4B Norton Healthcare Services Building (59f)
4B Norton Hospital (54d)
3B Nursing, School of (59b)
5C Old Turners Building (59h)
3C Parking Deck and Institutional Services Building University of Louisville Hospital (50i)
3B Research Resources Center (57)
5D Schultz Building (54f)
3B Steam and Chilled Water Plant (905)
3D University of Louisville Hospital (50c)

Shelby Campus

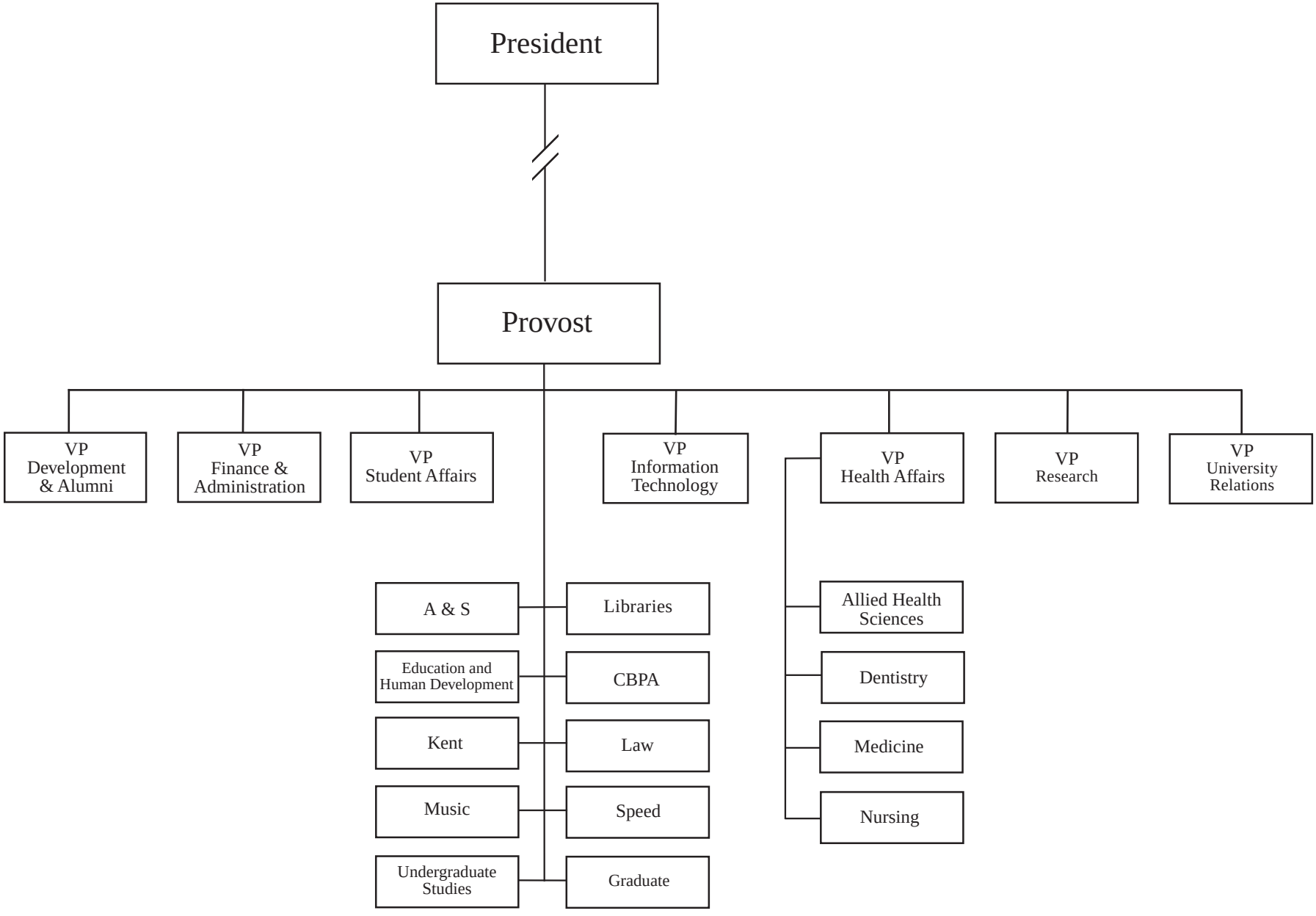


Building Index

Note: Buildings are numbered to assist location of campus facilities on public maps. These numbers are not official facility numbers and should not be used on University forms.

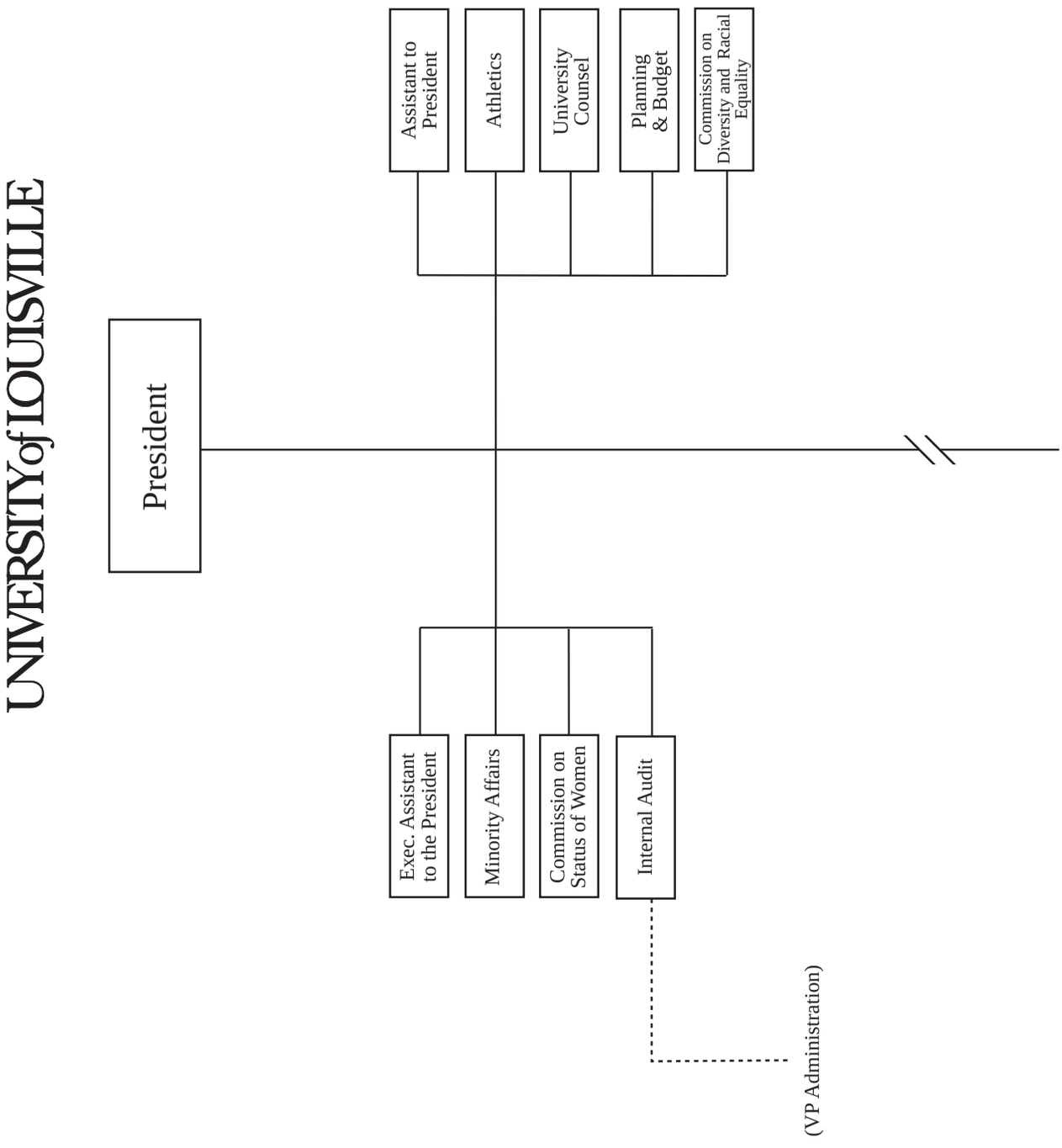
60 Burhans Hall
61x Central House
62a-g Dormitories
63 Founder's Union Building
3 Night Manager's Apartment
61h Seminar Center
67 Telecommunications Research Center

UNIVERSITY of LOUISVILLE



Organizational Charts

Table of Organization



Subject Index