

# COLLEGE OF ARTS AND SCIENCES

**William D. Lawson, Ph.D., Dean**  
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The College of Arts and Sciences was first organized as the School of Arts and Sciences in 1951. The School was elevated to the status of College in 1987. It currently consists of eleven departments, an interdisciplinary studies program, and the University's program in elementary education. Individual academic programs in the College are accredited by the National Association of Schools of Music, the Council on Social Work Education, and the National Association of Schools of Art and Design. All of the College's teacher education programs are accredited by the Tennessee Department of Education, and the University's entire teacher education unit is accredited by the National Council for the Accreditation of Teacher Education (NCATE). The College has 159 full-time faculty members, of whom 79 percent have doctoral degrees. There are over 2600 student majors in Arts and Sciences, approximately one hundred of whom are graduate students. On the graduate level the College has seven degree programs.

As a highly diverse College, it has a variety of objectives:

- **To promote academic excellence among faculty and students;**
- **To conduct sound programs of research in all of the disciplines represented in the College;**
- **To promote the biological, physical, mathematical, and social sciences;**
- **To promote understanding and appreciation of the arts and humanities;**
- **To provide a broad program of public service related to its instructional and research responsibilities;**
- **To prepare qualified teachers for a culturally diverse society.**

## DEGREE PROGRAMS

<b>Biological Science</b>	<b>Ph.D.</b>
<b>Biology</b>	<b>M.S.</b>
<b>Chemistry</b>	<b>M.S.</b>
<b>Criminal Justice</b>	<b>M.C.J.</b>
<b>English</b>	<b>M.A.</b>
<b>Mathematical Sciences</b>	<b>M.S.</b>
<b>Music</b>	<b>M.S.</b>

In addition, the College offers limited graduate work in French, History, Geography, Political Science, Statistics, Sociology, and Spanish, although graduate degrees are not available in these disciplines.

<b>Graduate Department</b>	<b>Number of Percent with Faculty Doctorate</b>	
Biological Sciences	12	100
Chemistry	9	100
Criminal Justice	3	100
History, Geography, and Political Science	10	100
Languages, Literature,	11	100

and Philosophy		
Music4	75	
Physics and Mathematics	11	100
Social Work and Sociology	5	100

**Terrance L. Johnson, Ph.D., Head**  
**110 McCord Hall**  
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**MAJOR: BIOLOGICAL SCIENCE**

**DEGREE: DOCTOR OF PHILOSOPHY**

**MAJOR: BIOLOGY**

**DEGREE: MASTER OF SCIENCE (M.S.) —**

**THESIS OPTION**

**MASTER OF SCIENCE (M.S.) —**

**NON-THESIS OPTION**

Prem S. Kahlon, Ph.D., Graduate Coordinator

The Department of Biological Sciences offers graduate programs leading to the Master of Science (M.S.) degree in Biology and the Doctor of Philosophy (Ph.D.) degree in Biological Science. Both curricula are designed to prepare scholars for the pursuit of research careers in academia, government, and industry, and to improve the level of competency of high school, college, and university teachers.

The Ph.D. in Biological Sciences is an interdepartmental degree program offered by the Department of Biological Sciences in the College of Arts and Sciences and the Department of Agricultural Sciences in the School of Agriculture and Home Economics. Admissions procedures for the Ph.D. program are outlined under the Department of Biological Sciences. The major advisor will be appointed by the department offering the student's primary emphasis. Course descriptions are listed under the respective departments.

**Admission Requirements: M.S. Program**

Unconditional admission to the M.S. program requires the applicant to have a bachelor's degree from a fully accredited four-year college or university, an undergraduate cumulative grade point average of 2.5 or better on a 4.0 scale, and a composite score of at least 870 on the verbal and quantitative portions of the Graduate Record Examination.

Conditional admission may be gained with a lower grade point average, but the GRE score must be correspondingly higher. If the undergraduate GPA is between 2.25 and 2.49, the GRE score must be 935; if the GPA is between 2.0 and 2.24, the GRE score must be 1,000. Applicants with less than a 2.5 undergraduate GPA must submit test scores at the time of application; applicants with a GPA of 2.5 or above may submit test scores in the first semester of attendance, but it is preferable that they submit test scores at the time of original application. The student must remove conditional status by earning at least a B (3.0) average in the first nine hours of graduate courses; failure to achieve this average will result in withdrawal from the program.

In addition, for unconditional admission the applicant must have accumulated a minimum of 24 acceptable semester hours in Biology plus a minimum of four semester hours of biochemistry. In some instances, conditional admission may be granted prior to the completion of these undergraduate course requirements, but a student must complete these courses before taking any graduate courses.

**Degree Requirements: M.S. Program**

The Department offers both thesis and non-thesis options in the master of science degree program. A minimum of 36 semester hours of approved courses is required for the M.S. degree under the thesis option, and a minimum of 39 semester hours is required under the non-thesis option. Students who choose the non-thesis option must pass a comprehensive examination (passing score 70% or above) taken no earlier than the term in which they complete their course work. Students interested in pursuing research careers in the academia, government or industry are highly encouraged to take the thesis option.

Required Courses: 23 hours in thesis option, 19 hours in non-thesis option

BIO 501, 502	Graduate Seminar I, II 1,1
BIO 510	Literature and Methods in
Research	3
BIO 511	Research in Biology 2
BIO 512	Thesis Writing (required only
	4
	in thesis option)

BIO 518  
CHEM 541, 542

Cell Biology 3  
Advanced Biochemistry I, II  
6

PSY 502 or

Statistics for Research in  
3

Equivalent

Education and Psychology

Elective Courses: 13 hours in thesis option, 20 hours in non-thesis option

Selection of elective courses must be made in consultation with the student's thesis committee or non-thesis advisor. Often, depending on the career direction or research interest of the student, a student may be advised to take elective courses in other departments or at other institutions. Included in the elective courses must be a physiology and a genetics course.

**Program of Study: M.S. Program**

The degree candidate must file a program of study after completing at least nine semester hours of graduate credit, but before completing fifteen hours of graduate credit. The program lists the courses which will be used to satisfy degree requirements, as well as detailing how other requirements will be met. The student may later change the program of study with the written approval of the Department and the Graduate School.

**Admission to Candidacy: M.S. Program**

When the candidate files the program of study, he or she must also apply for admission to candidacy. The candidate must have a grade point average of 3.0 or above to be eligible for admission to candidacy.

**Admission Requirements: Ph.D. Program**

Applicants to the Ph.D. program must submit a completed application form, a personal statement, and three letters of recommendation from persons familiar with the applicant's academic work, especially in Biology. The Departmental admissions committee will base admission upon these materials and interviews with selected applicants.

Admission requires the applicant to have a bachelor's degree from a fully accredited four-year college or university, an undergraduate cumulative grade point average of 2.5 or better on a 4.0 scale, a GRE verbal and quantitative minimal score of 870, and a minimum score of 600 on the GRE subject test in Biology. Students may also be admitted with GRE general and subject test scores below 870 and 600, but such students must take the Departmental diagnostic examination. The admissions committee will evaluate the student's performance on the examination and design a curriculum to eliminate any identified weaknesses. After passing the recommended courses with a grade of B or better in each, the student will begin the Ph.D. curriculum.

**Degree Requirements: Ph.D. Program**

Degree candidates must complete the core of required graduate courses (24 hours) with a grade of B or better in each course, pass the comprehensive examination, and gain approval of their dissertation proposal prior to obtaining admission to candidacy for the doctoral degree. Students may have a "C" grade in no more than two courses (6 credit hours), none of which can be a core course. No "D" or "F" grades are acceptable. A student who receives a grade of "C" in excess of six credits must repeat this course and achieve at least a "B". After gaining admission to candidacy the student must complete an approved curriculum (24 hours minimum of electives set by the student's research advisory committee), enroll in Graduate Seminar (BIO 701, 702), complete a dissertation (24 hours), and successfully defend the dissertation prior to gaining the Ph.D. degree (Please refer to Biological Sciences Graduate Student Handbook for specific dissertation requirements). A student entering with a Master's degree may have applicable hours transferred toward the Ph.D. program, as determined by the Advisory Committee. That total number hours required is 76.

**Required Courses: 24 Hours**

To be completed prior to Admission to Candidacy

BIO 510  
Research  
BIO 518  
BIO 610  
Science  
BIO 712  
CHEM 541, 542

Literature and Methods in  
3  
Cell Biology 3  
Frontiers in Molecular  
3  
Molecular Biology 3  
Advanced Biochemistry I, II  
6

CHEM 560  
 Chemistry  
 STAT 521  
 After Admission to Candidacy: 51 Hours  
 Electives  
 BIO 501, 502  
 BIO 701, 702  
  
 BIO 811  
 Total Required Hours  
 Graduate Elective Courses  
 BIO 507, 508  
 in the  
  
 BIO 513  
 BIO 514, 515  
 BIO 516  
  
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 BIO 530  
 BIO 540  
 BIO 541  
 BIO 546  
 BIO 547  
 Immunology  
 BIO 604  
 BIO 610  
 Science  
 BIO 611  
 BIO 621  
 Neuropharmacology  
 BIO 656  
 Microscopy  
 BIO 712  
 BIO 713  
 BIO 717  
 Genetics

Spectroscopic Methods in  
 3  
 Statistical Methods I 3  
  
 23  
 Graduate Seminar I, III, 1  
 Seminar in Biology I, II  
 1, 1  
 Dissertation Research 24  
 76  
  
 Methods of Teaching Science  
 6  
 College/University Setting  
 Evolution 3  
 Special Problems I, II 3, 3  
 Environmental Genetics  
 3  
 Advanced Genetics 3  
 Cell Biology 3  
 Ecology 3  
 General Physiology 3  
 Embryology 3  
 Advanced Parasitology  
 3  
 Arthropods and Diseases  
 3  
 Systemic Physiology 3  
 Plant Physiology 3  
 Microbial Genetics 3  
 Molecular Genetics 3  
 Immunology 3  
 Special Topics in  
 3  
 Individual Studies 3  
 Frontiers in Molecular  
 3  
 Individual Research 3  
 Introduction to  
 3  
 Techniques of Electron  
 3  
 Molecular Biology 3  
 Molecular Genetics 3  
 Selected Topics in Molecular  
 3

BIO 718	Advanced Cell Biology 3
BIO 719	Advanced Molecular Biology 3
BIO 726	Neurobiology 3
BIO 727	Selected Topics in 3
Neurobiology	
BIO 741	Advanced Microbiology 3

**Program of Study: Ph.D. Program**

The degree candidate must file a program of study after completing nine semester hours of graduate work, but before completing fifteen hours of graduate work. The program lists the courses which will be used to satisfy degree requirements, as well as detailing how other requirements will be met. The student may later change the program of study with the written approval of the Department and the Graduate School.

**Admission to Candidacy: Ph.D. Program**

The student must apply for admission to candidacy after completing the 24-hour core of required courses (See Degree Requirements: Ph.D. program, above.) with an average of B (3.0) or better, passing the comprehensive examination, and gaining approval of the dissertation proposal.

**MINOR**

The Department offers a graduate minor in Biology as a subject field for graduate students seeking advanced degrees in teaching (M.S., M.Ed., or Ed.D.). A minor consists of twelve semester hours of graduate courses approved by the advisor in the major program.

**DESCRIPTION OF COURSES**

**BIO 501, 502. GRADUATE SEMINAR I, II. (1, 1)** *Current problems in biology. Courses meet weekly during each semester of the regular school year and summer terms. Both courses are required of all degree candidates in the Department.*

**BIO 507, 508. METHODS OF TEACHING SCIENCE IN THE COLLEGE/UNIVERSITY SETTING. (3, 3)** *Teaching methods and techniques suitable for college and university level courses. Instruction in developing course outlines, lectures, and laboratory experiences, and in evaluating student progress is given. Assignment to a faculty mentor for development of teaching skills is a part of this two-semester course. Individual students work in a specific course (upper-division undergraduate or lower-division graduate) and observe classroom teaching and assist with laboratory preparations and operations. The student, under the direction of the faculty mentor, makes preparation and teaches at least one unit of subject matter. Prerequisite: Permission of major advisor and faculty mentor.*

**BIO 510. LITERATURE AND METHODS IN RESEARCH. (3)** *The methods of literature review, with primary emphasis on methods in biological research and research laboratory rotation. The student is expected to concentrate on the literature in the student's proposed area of research and rotate through three research laboratories (4 weeks each) of the student's choice. Required of all degree candidates. Formerly BIO 517.*

**BIO 511. RESEARCH IN BIOLOGY. (2)** *Individual research under the supervision of the research advisor. The student must present a general statement of proposed research and obtain the approval of the guidance committee. Prerequisite: BIO 510. Required of all M.S. candidates. Formerly BIO 516.*

**BIO 512. THESIS WRITING. (4)** *The preparation of a thesis over individual research under the supervision of the guidance committee. The format of the thesis must conform*

to that adopted by the Department of Biological Sciences. Once students have registered for this course they must continue to enroll in it every semester until they complete the thesis and are examined over it. Prerequisite: BIO 511. Required of all students who write a thesis.

**BIO 513. EVOLUTION. (3)** Current evolutionary theory including systematics, with an examination of macroevolutionary patterns and microevolutionary processes. Students use computer simulation techniques to construct models illustrating the concepts discussed.

**BIO 514, 515. SPECIAL PROBLEMS I, II. (3, 3)** Short-term specialized problems in the area of major emphasis of the research investigator. The student is expected to develop and master techniques that are necessary for carrying out the assigned problem. Prerequisite: permission of instructor and thesis or graduate advisor. Three laboratory periods.

**BIO 516. ENVIRONMENTAL GENETICS. (3)** The diversity of organisms, populations, and communities. Specific intricacies of the living world are elucidated. The laboratory work includes the study of organisms treated with mutagens. Chromosomal aberrations as well as phenotypic changes are observed. Students who have had at least 12 hours of Biology, including BIO 212, 212L (Principles of Genetics) and BIO 547 (Special Topics in Immunology) or the equivalents, may elect this course. Prerequisite: permission of instructor. Two lectures and one laboratory period weekly. Formerly BIO 510.

**BIO 517. ADVANCED GENETICS. (3)** The nature of the gene, the principles governing genic mutation and change in chromosomal structure, and the results of the operation of these principles. Prerequisite: permission of the instructor. Two lectures and one laboratory period. Formerly BIO 511.

**BIO 518. CELL BIOLOGY. (3)** The structure and behavior of the cell and its components with special emphasis on mitosis and meiosis. Prerequisite: permission of instructor. Two lectures and one laboratory period. Required of all degree candidates.

**BIO 519. ECOLOGY. (3)** Study of how ecological systems function and the reciprocal interrelationships between the structure and composition of a system and its pattern of function. Some time is devoted to an examination of that body of theory which deals with ecological models, both experimental and mathematical. Prerequisite: BIO 412, 412L (Principles of Ecology) or permission of instructor. Two lectures and one laboratory period.

**BIO 520. GENERAL PHYSIOLOGY. (3)** The chemical and physical nature of protoplasm. Considered are its chemical constituents and their properties, its colloidal nature, and the bearing of this state on its physical properties and processes. Prerequisite: permission of instructor. Two lectures and one laboratory period.

**BIO 521. EMBRYOLOGY. (3)** The principles and mechanisms of developmental physiology. Prerequisite: BIO 421, 421L (Embryology) or equivalent, or permission of instructor. Two lectures and one laboratory period. Formerly ZOO 530.

**BIO 522. ADVANCED PARASITOLOGY. (3)** Life histories, taxonomy, morphology, and general importance of the parasitic protozoa and helminths to man and animals. Prerequisite: permission of the instructor. Two lectures and one laboratory period per week. Formerly ZOO 541.

**BIO 523. ARTHROPODS AND DISEASES. (3)** Survey of the various orders, classes, genera, and species in the phylum arthropods that act as both ectoparasites and endoparasites in man, food animals, and domesticated animals. The course also explores the hyperparasitism in which certain genera of arthropods are parasitic to other arthropods belonging to different genera and species. Prerequisite: permission of instructor. One lecture and two laboratory periods per week. Formerly ZOO 542.

**BIO 524. SYSTEMIC PHYSIOLOGY. (3)** Functions of different organ systems with emphasis on the human nervous system, muscular system, cardiovascular system, respiratory system, digestive system, urinary system, and endocrine system. Prerequisite: permission of instructor. Two lectures and one two-hour laboratory period. Formerly ZOO 590.

**BIO 530. PLANT PHYSIOLOGY. (3)** Current topics in plant growth, development, metabolism, nutrition, and water relations. Research papers in plant metabolism and development are written and reviewed. Prerequisite: 8 hours in botany. Two lectures and one laboratory period.

**BIO 540. MICROBIAL GENETICS. (3)** The heredity of viruses, bacteria, molds, yeast, and protozoa, with emphasis on protozoan genetics. Physiologic aspects primarily relating to genetics in these forms are also considered. Prerequisites: BIO 212, 212L (Principles of Genetics) and permission of instructor. In addition, BIO 511 is recommended.

**BIO 541. MOLECULAR GENETICS. (3)** The application and utilization of microorganisms, plants and animal systems in biotechnology. Emphasis is placed on the methods and techniques used in these systems.

**BIO 546. IMMUNOLOGY. (3)** Topics concerning all aspects of antigen-antibody reactions. Emphasis is placed on laboratory problems and procedures associated with immunology. Prerequisites: BIO 340, 340L (Introduction to Microbial Physiology), 440, 440L (Pathogenic Microorganisms), and 441, 441L (Immunology and Serology), or permission of instructor. Two lectures and one laboratory period. Formerly MCB 560.

**BIO 547. SPECIAL TOPICS IN IMMUNOLOGY. (3)** The study of a variety of sub-disciplines, including host-parasite-environment relations. Recent topics in immunology are presented by students and staff members. Prerequisite: permission of instructor. Two lectures and one laboratory per week. Formerly MCB 660.

**BIO 604. INDIVIDUAL STUDIES. (3-9)** Doctoral individual study under the guidance of the graduate curriculum advisory committee and may not be credited toward graduate degree programs of the Department of Biology. May be repeated as topics vary. Maximum hours nine (9) with three (3) registrations.

**BIO 610. FRONTIERS IN MOLECULAR SCIENCE. (3)** Survey of current research topics in cellular, developmental, and molecular biology. The use of molecular techniques to study cell structure and function is emphasized. Prerequisites: CHEM 541, 542. Required of all Ph.D. candidates.

**BIO 611. INDIVIDUAL RESEARCH. (3-6)** Doctoral research of independent nature. May be repeated twice for credit up to six (6) hours. Prerequisite: Candidacy admission to the Ph.D. Program.

**BIO 621. INTRODUCTION TO NEUROPHARMACOLOGY. (3)** Course derived from three areas of pharmacology: 1) general principles, 2) pharmacology of drugs affecting cell growth, and 3) central nervous system pharmacology.

*BIO 656. TECHNIQUES OF ELECTRON MICROSCOPY. (3) Introduction to electron optics and types of electron microscopes. Techniques of tissue preparation, fixation, embedment, ultramicrotomy, staining, and EM photography are included. Prerequisite: Permission of instructor.*

*BIO 701, 702. SEMINAR IN BIOLOGY I, II. (1, 1) Topics relevant to biology, biotechnology, and environmental science presented by faculty, visiting scholars and graduate students. Participating graduate students who have achieved candidacy status present one seminar per year. Both courses are required of all Ph.D. candidates in Biological Sciences. Candidates must register for 701 and 702 in their first two semesters of residency, unless they have not completed BIO 501 and 502 or the equivalent, in which case they must register for these courses. Each course may be repeated once for an additional hour of credit. BIO 501 and 502 are prerequisites to 701, and 701 is a prerequisite to 702.*

*BIO 712. MOLECULAR BIOLOGY. (3) A detailed introduction to prokaryotic and eukaryotic molecular biology. Most of the course focuses on the fundamentals of molecular genetics: the structure and function of the gene, genetic organization of chromosomes, the genetic code, the molecular mechanisms of transcription, RNA processing, translation, DNA replication and recombination, and the molecular mechanisms of transcription, RNA processing, translation, DNA replication and recombination, and the molecular mechanisms of regulation of gene expression and enzyme activity. The model systems studied include both prokaryotes (bacteria and bacterial viruses) and simple eukaryotes (yeast, slime molds, and animal viruses). Prerequisites: CHEM 541, 542. Required of all Ph.D. candidates.*

*BIO 713. MOLECULAR GENETICS. (3) An examination of the structure and function of gene systems in prokaryotes, eukaryotes and viruses. This course also explores the process of RNA editing and other regulatory circuits, including DNA repair, control of transcription, translation and post-translation events. Prerequisites: CHEM 541, 542.*

*BIO 717. SELECTED TOPICS IN MOLECULAR GENETICS. (3-6) Current research interest in the areas of molecular genetics. May be repeated for credit as topics vary for no more than six (6) hours. Prerequisites: Consent of Doctoral Advisory Committee.*

*BIO 718. ADVANCED CELL BIOLOGY. (3) Molecular biology of animal cells with emphasis on assembly of cellular organelles, function and organization of membrane systems receptors, energy mechanisms, and secretion. Properties and functions of microfilaments and microtubules, Golgi apparatus, mitochondria, ribosomes, and the nucleus are considered also. Prerequisites: BIO 518, CHEM 541, 542, or permission of instructor.*

*BIO 719. ADVANCED MOLECULAR BIOLOGY. (3) A review of prokaryotic and eukaryotic molecular biology literature. Discussions involve defining the mechanisms and methods used to solve biological problems. Prerequisite: BIO 712.*

*BIO 726. NEUROBIOLOGY. (3) Principles and mechanisms of the nervous system in invertebrate and vertebrate organisms. Topics including neurotransmitters, effector control, integration, inhibition, and localized excitation are considered. A study of the ionic and electrical mechanisms involved in the generation and conduction of nerve impulses is also included. Prerequisite: permission of instructor.*

*BIO 727. SELECTED TOPICS IN NEUROBIOLOGY. (3-6) Current research interest in the field of neurobiology. May be repeated for credit as topics vary for no more than six (6) hours. Prerequisites: Consent of Doctoral Advisory Committee.*

*BIO 741. SELECTED TOPICS IN MICROBIOLOGY. (3-6) Current research interests in the various fields of microbiology. May be repeated for credit as topics vary for no more than six (6) hours. Prerequisite: Consent of Doctoral Advisory Committee.*

*BIO 811. DISSERTATION RESEARCH. (1-9) Individual research under the supervision of the advisor. The candidate must have an approved dissertation proposal. A minimum of three registrations is required with a maximum of nine hours per registration. Dissertation hours must total at least 24. Prerequisites: admission to candidacy and permission of advisor. Required of all Ph.D. candidates.*

#### GRADUATE FACULTY

Carolyn Alexander-Caudle, Associate Professor

B.A., 1967, Fisk University; M.A., 1970, Indiana University; M.S., 1979, Meharry Medical College; Ph.D., 1988, Meharry Medical College

Mary Ann Asson-Batres, Assistant Professor

B.S., 1970, University of Portland; M.A.T., 1971, University of Chicago; M.S., 1982, University of Oregon; Ph.D., 1990, Oregon Health Sciences University

M. Ann Blackshear, Associate Professor

B.S., 1967, Knoxville College; Ph.D., 1979, Meharry Medical College

Anthony Ejiofor, Assistant Professor

B.S., 1976, Ph.D., 1983 University of Nigeria Nsukka

Philip F. Ganter, Associate Professor

B.S., 1973, Glassboro State College; Ph.D., 1981, University of North Carolina, Chapel Hill

Michael Ivy, Assistant Professor

B.A., 1978, University of Southern Illinois; Ph.D., 1986, University of Illinois

Terrance L. Johnson, Professor and Department Head

B.S., 1974, M.S., 1976, East Texas State University; Ph.D., 1985, University of North Texas

Prem S. Kahlon, Professor and Graduate Coordinator

B.S., 1956, Punjab University (India); M.S., 1962, Ph.D., 1964, Louisiana State University

E. Lewis Myles, Associate Professor

B.S., 1974, M.S., 1976, Tennessee State University; Ph.D., 1985, University of Arizona

Robert F. Newkirk, Professor

B.S., 1963, Livingstone College; M.S., 1968, Virginia State College; Ph.D., 1972, Colorado State University

John T. Robinson, Assistant Professor

B.S., 1985, North Carolina Central University; Ph.D., 1993, University of North Carolina at Chapel Hill

Benny Washington, Jr., Associate Professor

B.S., 1975, M.S., 1979, Tennessee State University; Ph.D., 1985, Atlanta University

Carlos W. Lee, Ph.D., Head

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#### MAJOR: CHEMISTRY

##### DEGREE: MASTER OF SCIENCE (M.S.)

The Department of Chemistry offers the Master of Science (M.S.) degree in Chemistry. The objectives of the program include: 1) advancing, interpreting, disseminating, and preserving knowledge of chemistry; 2) engaging in research and publication of new scientific knowledge; 3) educating graduate students to take their proper place in industry, education, and public life. The M.S. degree represents from one to two academic years of full-time study beyond an acceptable bachelor's degree. The candidate must complete a program of study approved by his or her major professor, the Department Head, and the Dean of the Graduate School.

##### Admission Requirements

Unconditional admission to the M.S. program requires the applicant to have a bachelor's degree from a fully accredited four-year college or university, an undergraduate cumulative grade point average of 2.5 or better on a 4.0 scale, and a composite score of at least 870 on the verbal, quantitative, and subject portions of the Graduate Record Examination. Applicants with less than a 2.5 undergraduate GPA must submit test scores at the time of application; applicants with a GPA of 2.5 or above may submit test scores in the first semester of attendance, but it is preferable that they submit test scores at the time of original application.

Conditional admission may be gained with a lower grade point average than 2.5, but the GRE score must be correspondingly higher. If the undergraduate GPA is between 2.25 and 2.49, the GRE score must be 935; if the GPA is between 2.0 and 2.24, the GRE score must be 1,000.

The student must remove the conditional status by earning at least a B (3.0) average in the first nine hours of graduate courses; failure to achieve this average will result in withdrawal from the program.

In addition, the applicant must have an undergraduate major in Chemistry, or the equivalent. In some instances, conditional admission may be granted prior to completion of the undergraduate course requirements, but a student must complete these courses before taking any graduate courses.

#### Degree Requirements

Students are required to take at least one three-hour course each in inorganic, organic, physical, and analytical chemistry. The student must complete and defend a thesis based upon his or her research. This research should involve contributions of a publishable quality. There is no foreign language reading requirement for the M.S. degree in Chemistry.

The M.S. degree requires thirty semester hours of course work: twenty-one hours of required courses, including research and thesis writing, and nine hours of suggested electives chosen with the consent of the research advisor.

#### 1. Required Courses: 21 hours

CHEM 500	Advanced Inorganic Chemistry I	3
CHEM 511	Research	5
CHEM 512	Thesis Writing	2
CHEM 521	Advanced Organic Chemistry I	3
CHEM 531	Advanced Physical Chemistry I	3
CHEM 551	Advanced Analytical Chemistry	3
CHEM 600A,B	Seminar I, II	1,1

#### 2. Electives: 9 hours, with the consent of the advisor

CHEM 501	Advanced Inorganic Chemistry II	3
CHEM 522	Advanced Organic Chemistry II	3
CHEM 532	Advanced Physical Chemistry II	3
CHEM 536	Chemical Kinetics	3
CHEM 541, 542	Advanced Biochemistry I, II	3,3
CHEM 560	Spectroscopic Methods in Chemistry	3
CHEM 561, 562	Polymer Chemistry I, II	3,3
CHEM 563	Advanced Polymer Chemistry	3
CHEM 640A	Special Topics in Analytical Chemistry	3
CHEM 640B	Special Topics in Biochemistry	3
CHEM 640C	Special Topics in Inorganic Chemistry	3
CHEM 640D	Special Topics in Organic Chemistry	3
CHEM 640E	Special Topics in Physical Chemistry	3

**(Other Electives: 500- or 600-level courses in Biology, Mathematics, Physics, or Engineering)**

#### Program of Study

The degree candidate must file a program of study after completing at least nine semester hours of graduate study but no more than fifteen hours. The program of study lists the courses which will be used to satisfy degree requirements, as well as detailing how other requirements will be met. The student may later change the program of study with the written approval of the Department and the Graduate School.

#### Admission to Candidacy

The individual must file for admission to candidacy at the same time he or she submits the program of study. The candidate must have a grade point average of 3.0 or above to be eligible for admission to candidacy.

#### DESCRIPTION OF COURSES

*CHEM 500. ADVANCED INORGANIC CHEMISTRY I. (3) Topics include atomic and molecular structure, bonding theories, molecular symmetry; and group theory, chemistry of transition metals and organometallic complexes, and catalysis. Prerequisites: CHEM 322 (Physical Chemistry II) and CHEM 420, 420L (Inorganic Chemistry I). Required of all degree candidates. Offered only in fall.*

*CHEM 501. ADVANCED INORGANIC CHEMISTRY II. (3) Spectroscopic characterization of inorganic and organometallic compounds, and reaction mechanisms of inorganic, organometallic, and bioinorganic compounds. Prerequisite: CHEM 421 (Inorganic Chemistry II) or CHEM 500. Offered only in spring.*

*CHEM 511. RESEARCH. (1-9) A variable-credit course in methods of research and reporting in the field of chemistry. Only five hours is applicable toward degree requirements. Required of all degree candidates. Offered every semester.*

*CHEM 512. THESIS WRITING. (2) Research and writing under the supervision of the thesis director. Once students have registered for this class, they must re-enroll in it every semester until they complete the thesis. Required of all degree candidates. Offered every semester.*

*CHEM 521. ADVANCED ORGANIC CHEMISTRY I. (3) A critical study of the structural theory of organic chemistry and advanced discussion of reaction mechanism.*

*Prerequisites: CHEM 212, 212L (Organic Chemistry II [formerly CHEM 312, 312L]) and CHEM 322, 322L (Physical Chemistry II). Required of all degree candidates.*

*Offered only in fall.*

*CHEM 522. ADVANCED ORGANIC CHEMISTRY II. (3) Synthesis of natural products.*

*Prerequisite: CHEM 521, or permission of instructor. Offered only in spring.*

*CHEM 531. ADVANCED PHYSICAL CHEMISTRY I. (3) A broad discussion of the laws of thermodynamics, quantum mechanics, spectroscopy, and classical transport processes, as well as an introduction to statistical mechanics. Prerequisites: CHEM 322, 322L (Physical Chemistry II). Required of all degree candidates. Offered only in spring.*

*CHEM 532. ADVANCED PHYSICAL CHEMISTRY II. (3) A focus on quantum mechanics as it applies to chemistry, including molecular orbital theory and the relationship of quantum mechanics to molecular spectroscopy. Prerequisite: CHEM 531, or permission of the instructor. Offered only in the fall.*

*CHEM 536. CHEMICAL KINETICS. (3) Experimental and theoretical considerations of chemical reaction rates and mechanisms. Prerequisite: CHEM 531. Offered on demand.*

*CHEM 541. ADVANCED BIOCHEMISTRY I. (3) An in-depth study of the chemical and physical properties and biological functions of proteins, carbohydrates, lipids, and nucleic acids. Prerequisites: CHEM 342, 342L (General Biochemistry II), or permission of instructor. Offered only in fall.*

*CHEM 542. ADVANCED BIOCHEMISTRY II. (3) An in-depth study of the catabolic pathways, including their chemical reactions, energetics, and regulation. Prerequisite: CHEM 541, or permission of the instructor. Offered only in spring.*

*CHEM 551. ADVANCED ANALYTICAL CHEMISTRY. (3) A critical study of recent developments in chemical and instrumental methods of analysis. Prerequisite: CHEM 322, 322L (Physical Chemistry II). Required of all degree candidates. Offered only in spring.*

*CHEM 560. SPECTROSCOPIC METHODS IN CHEMISTRY. (3) Various spectroscopic methods in chemistry, concentrating on the practical aspect of using spectroscopic techniques to solve structural problems. Techniques include ultraviolet spectroscopy, infrared spectroscopy, nuclear magnetic resonance (NMR) spectroscopy, including "two dimensional" (2D) NMR in solving problems, mass spectroscopy (MS), and x-ray crystallography. Prerequisites: CHEM 212, 212L (Organic Chemistry II) or equivalent. Offered in fall.*

*CHEM 561, 562. POLYMER CHEMISTRY I, II. (3,3) Organic chemical reactions leading to high polymers, physical properties and physical behavior of polymers, polymer processing, and end uses. Prerequisites: CHEM 212, 212L (Organic Chemistry*

*II) and CHEM 322, 322L (Physical Chemistry II), or permission of the instructor. CHEM 561 offered in fall and 562 in spring.*

*CHEM 563. ADVANCED POLYMER CHEMISTRY. (3) A detailed study of polymerization reactions of vinylic and non-vinylic monomers with special attention to mechanisms, stereochemistry, and copolymerization, and a brief survey of reactions of polymers. Prerequisites: CHEM 561, 562 or CHEM 461, 462, 462L (Introduction to Polymer Chemistry I, II). Offered on demand.*

*CHEM 600A, 600B. SEMINAR I, II. (1, 1) Review and discussion of important current literature in the various areas of chemistry. Both courses required of all degree candidates. CHEM 600A offered in fall and 600B in spring.*

*CHEM 640A, 640B, 640C, 640D, 640E. SPECIAL TOPICS IN ANALYTICAL CHEMISTRY, BIOCHEMISTRY, INORGANIC CHEMISTRY, ORGANIC CHEMISTRY, AND PHYSICAL CHEMISTRY. (3, 3, 3, 3, 3) Faculty-generated lecture courses on selected topics of current interest or student need. Offered on demand.*

#### GRADUATE FACULTY

William Y. Boadi, Assistant Professor

B.S., 1982, University of Science and Technology (Ghana); M.S., 1988, D.Sc., 1991, Technion-IIT (Israel)

Fu-Ming Chen, Professor

B.S., 1960, Tunghai University (Taiwan); M.S., 1964, Ph.D., 1966, University of Illinois

Peter A. Iyere, Associate Professor

B.S., 1980, M.S., 1982, University of Ibadan (Nigeria); M.A., 1989, Ph.D. 1991, Brandeis University

Mohammad R. Karim, Associate Professor

B.S., 1978, M.S., 1980, Jahangirnagar University (Bangladesh); Ph.D., 1989, Kent State University

Carlos W. Lee, Associate Professor and Department Head

B.S., 1991, Appalachian State University; Ph.D., 1995, University of Tennessee, Knoxville

Ying-Ming Lin, Professor

B.S., 1960, National Taiwan University, Taipei (Taiwan); Ph.D., 1973, University of Tennessee, Memphis

Cosmas O. Okoro, Assistant Professor

B.S., 1981, M.S., 1986, North Carolina Central University; Ph.D., 1993, Howard University

Margaret M. Whalen, Assistant Professor

B.S., 1979, South Dakota School of Mines and Technology; Ph.D., 1984, University of New Mexico School of Medicine

Gregory H. Zimmerman, Associate Professor

B.S.Ed., 1986, Millersville University; Ph.D., 1994, University of Delaware

C. Bruce Mallard, Ph.D., Head  
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(Graduate Building)  
615-963-5571

#### MAJOR: CRIMINAL JUSTICE

##### DEGREE: MASTER OF CRIMINAL JUSTICE

(M.C.J.) Offered as a joint degree  
with the Department of Criminal  
Justice, Middle Tennessee State  
University.

The purpose of the M.C.J. program is to provide students and practitioners in the criminal justice system, especially those in the state of Tennessee, the opportunity to obtain advanced education in the area of Criminal Justice. In order to make the best use of the present facilities and content areas at Tennessee State University and MTSU, this program is offered jointly. Eighteen hours of course work must be taken at each institution.

#### Admission Requirements

Unconditional admission to the M.C.J. program requires the student to have a bachelor's degree from a fully accredited four-year college or university, an undergraduate grade point average of 2.5 or better on a 4.0 scale, and a composite score of at least 600 on the verbal and quantitative portions of the Graduate Record Examination (GRE), or at least 25 on the Miller Analogies Test (MAT). Students with less than a 2.5 undergraduate GPA must submit test scores at the time of application; students with a GPA of 2.5 or above may submit test scores in the first semester of attendance, but it is preferable that they submit test scores at the time of original application. In addition, the individual must have a minimum of eighteen hours of work at the undergraduate level in Criminal Justice or an approved equivalent.

Conditional admission may be gained with a lower grade point average, but the GRE or MAT score must be correspondingly higher.

If the undergraduate GPA is between 2.25 and 2.49, the GRE score must be 645 or the MAT score 32. If the GPA is between 2.0

and 2.24, the GRE score must be 690 or the MAT score 39. Conditional admission may also be granted to a student with a limited number of deficiencies in undergraduate course prerequisites; these course deficiencies must be removed before enrollment in Criminal Justice courses at the graduate level. The student must remove conditional status by earning at least a B (3.0 average) in the first nine hours of graduate courses; failure to achieve this average will result in withdrawal from the program.

**Degree Requirements**

The total program consists of thirty-six semester hours of course work. Six hours of core courses must be taken at each institution; six more semester hours of research and thesis (CJ 664 and 690) must be taken at one institution, which must be designated at the time of admission to candidacy.

**1. Required Courses (12 Hours)**

Six hours of core courses taken at each institution

Six hours taken at one institution to be designated at the time of admission to candidacy

CJ 664

Thesis 3

CJ 690

Research in Criminal Justice 3

**2. Distribution of Courses**

(Required Courses Included) 36 Hours

**MIDDLE TENNESSEE STATE UNIVERSITY**

CJ 600 Criminal Justice Administration

3

CJ 601 Seminar in Law

3

Additional Courses

12

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18

**TENNESSEE STATE UNIVERSITY**

CJ 602 Judicial Seminar

3

CJ 603 Contemporary Corrections

3

Additional Courses

12

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18

**Program of Study**

The degree candidate must file a program of study after completing at least nine semester hours of graduate study but no more than fifteen hours. The program of study lists the courses which will be used to satisfy degree requirements, as well as detailing how other requirements will be met. The student may later change the program of study with the written approval of the Department and the Graduate School.

**Admission to Candidacy**

The individual must file for admission to candidacy at the same time he or she submits the program of study. The candidate must have a grade point average of 3.0 or above to be eligible for admission to candidacy.

**DESCRIPTION OF COURSES**

*CJ 590. INDEPENDENT READINGS. (3) A course designed for the advanced student who is capable of independent study. The student is allowed to do readings in depth in a particular area of criminal justice relevant to his/her individual interest.*

*CJ 602. JUDICIAL SEMINAR. (3) An analysis of the judicial segment of the criminal justice system, including jurisdiction, authority and power, quality of judges, and structure of court systems. Required of all degree candidates. Must be taken on TSU campus.*

*CJ 603. CONTEMPORARY CORRECTIONS. (3) An overall analysis of contemporary corrections philosophy and programs in contemporary institutions, as well as community-based programs, their problems and prospects. Required of all degree candidates. Must be taken on TSU campus.*

*CJ 604. THE CONCEPT OF JUSTICE. (3) A study of the historical and philosophical development of law and justice, with emphasis on contemporary application to the criminal justice process.*

*CJ 623. POLICE MANAGEMENT SYSTEM. (3) An analysis of the administrative behavior and organizational problems of change in police management, as well as public reaction.*

*CJ 625. CRIMINAL JUSTICE INTERNSHIP. (3) An intensive field experience in a criminal justice agency. The selection of the placement agency is determined by the student's advisor.*

*CJ 630. INNOVATIONS IN LAW ENFORCEMENT. (3) A review of recent and current developments and practices in law enforcement management, with emphasis on the experimental and "pilot project" approaches. Course includes intensive comparison of traditional vs. non-traditional models. (MTSU only)*

*CJ 641. ADVANCED CONSTITUTIONAL LAW. (3) A review of pre-trial rights such as arrest, search and seizure, bail, speedy trial, and right to counsel. Emphasis on Constitutional U.S. Supreme Court cases.*

*CJ 643. CRIMINAL LAW: THE DEFENSE SIDE. (3) A study of how a criminal case is handled by criminal defense attorneys from arrest through appeal; ethical problems arising for defense attorneys; plea bargaining.*

*CJ 650. INTERVIEWING AND COUNSELING JUVENILES. (3) Methods and techniques of interviewing and counseling with juvenile and youthful offenders, with emphasis on the initial interview. Topics include protection of legal rights in the interview setting, an overview of environmental and behavioral considerations, and implications of interviewing and counseling in the juvenile justice process.*

*CJ 664. THESIS. (3) Research for and composition of an acceptable thesis. Once students have enrolled in this course, they must continue to enroll in it until they complete the thesis and are examined over it. Required of all degree candidates. Prerequisite: CJ 690.*

*CJ 670. COMMUNITY-BASED CORRECTIONS. (3) The probation and parole division of the adult and juvenile sections of the corrections components of the criminal justice system, as well as the development of community institutions. Specific laws and procedures of the divisions, as well as treatment methods of each, are explored.*

*CJ 683. VIOLENCE AND VICTIMOLOGY. (3) A survey of the rights of defendants involved with the criminal justice process. Topics include the rights of defendants to fair and reasonable treatment within the criminal justice system and in corrections, and the new ideas developing around the right to treatment and the right of society to exist without violence. The impact of violence on victims and potential victims is also examined.*

*CJ 690. RESEARCH IN CRIMINAL JUSTICE. (3) Intensive study of basic and advanced research methods and strategies as applied to the criminal justice system. Required of all degree candidates. Prerequisite to CJ 664.*

*CJ 692. SEMINAR IN CRIMINAL JUSTICE PLANNING AND MANAGEMENT. (3) The planning process in criminal justice, including implications for management at various levels, and federal funding sources for particular purposes.*

*CJ 693. COMPARATIVE SYSTEMS IN CRIMINAL JUSTICE. (3) Police, courts, and corrections studied comparatively among American and several foreign systems. A cross-cultural analysis of innovative programs is made to foster conclusions about philosophically interrelated systems. Penal treatment as a measure of cultural maturity is discussed both as an end in itself and as a basis for comparison.*

*CJ 694. CRIMES, CRIMINALS, AND THEIR TREATMENT. (3) Crime typology, theories of criminal behavior, and methods of treatment. Emphasis is on institutional treatment programs.*

*CJ 695. BUSINESS AND INDUSTRIAL SECURITY. (3) Survey of the problems of business and industrial security, the economic impact on society, the responsibilities of*

*the criminal justice system, effectiveness of traditional criminal justice agencies, and programs of prevention, including the training of management and security personnel.*

**GRADUATE FACULTY**

C. Bruce Mallard, Associate Professor and Department Head

B.A., 1969, George Peabody College; M.P.A., 1972, Middle Tennessee State University; Ph.D., 1979, University of Tennessee.

David K. Wheaton, Professor

B.A., 1962, Northwestern Christian College; B.D., 1966, Texas Christian University; M.A., 1967, Sam Houston University; Ph.D., 1973, Oklahoma State University

Larry D. Woods, Professor

B.A., 1966, Emory University; J.D., 1969, Northwestern University School of Law

Joel H. Dark, Ph.D., Head  
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The Department of History, Geography, and Political Science offers graduate courses in all three of its disciplines. Although the University does not offer a graduate degree in any of its disciplines, students may earn a History concentration under the M.Ed. degree in Curriculum and Instruction. (See the M.Ed. requirements in the College of Education.) The purpose of this program is to develop teachers of history and the social sciences.

**Admission Requirements**

Unconditional admission to the program requires the applicant to have a bachelor's degree from a fully accredited four-year college or university, an undergraduate cumulative grade point average of 2.5 or better on a 4.0 scale, and a composite score of at least 870 on the verbal, quantitative, and subject (History) portions of the Graduate Record Examination or a score of 25 on the Miller Analogies Test.

Conditional admission may be gained with a lower grade point average, but the GRE or the MAT score must be correspondingly higher. If the undergraduate GPA is between 2.25 and 4.9, the GRE score must be 935 or the MAT score 32. If the GPA is between 2.0 and 2.24, the GRE score must be 1000 or the MAT score 39. Applicants with less than a 2.5 undergraduate GPA must submit test scores at the time of application; applicants with a GPA of 2.5 or above may submit test scores in the first semester of attendance, but it is preferable that they submit test scores at the time of original application.

For unconditional admission, an applicant must have at least the equivalent of an undergraduate minor in History, which is a minimum of eighteen semester hours. In some instances, conditional admission may be granted prior to completion of the undergraduate course requirements, but a student must complete these courses before taking any graduate courses.

**Degree Requirements**

To receive the M.Ed. in Curriculum and Instruction with a concentration in History, the student must complete 33 semester hours, including 15 hours in the Education core, and 18 hours of History. The student should select an advisor in the Department of History, Geography, and Political Science, in addition to his or her principal advisor in the College of Education.

**Required Courses: 15 hours**

EDCI 511	Research and Statistics in Education	3
EDCI 526	Philosophy of Education	3
EDCI 530	Multicultural Education	3
PSY 543	Advanced Educational Psychology	3
EDCI 610	Curriculum Planning and Programming in Public Schools	3

**History, Geography, and Political Science Courses:**

18 hours of electives in History

A degree candidate must be certified to teach before the degree is awarded.

**Program of Study**

The degree candidate must file a program of study after completing at least nine semester hours of graduate study but no more than fifteen hours. The program of study lists the courses which will be used to satisfy degree requirements, as well as detailing how other requirements will be met. The student may later change the program of study with the written approval of the Department of History, the Department of Teaching and Learning, and the Graduate School.

**Admission to Candidacy**

The individual must file for admission to candidacy at the same time he or she submits the program of study. The candidate must have a grade point average of 3.0 or above to be eligible for admission to candidacy.

**Post-Master's Training**

Graduate courses at the 600 level are offered for in-service teachers and for persons enrolled or planning to enroll in doctoral programs.

DESCRIPTION OF COURSES

HISTORY (HIST)

*HIST 501, 502. SEMINAR IN AMERICAN HISTORY I, II. (3, 3) An intense study of selected problems in the history of the United States from 1607 to the present.*

*HIST 511. HISTORICAL METHODS. (3) The principles and techniques of research in the study of history, including problems in the preparation of a manuscript.*

*HIST 531, 532. RECENT UNITED STATES HISTORY I, II. (3, 3) The study of contemporary problems in historical literature through an analysis of American historians and their writings.*

*HIST 533. AMERICAN HISTORIOGRAPHY. (3) An introduction to historical literature through an analysis of American historians and their writings.*

*HIST 534. EUROPEAN HISTORIOGRAPHY. (3) An introduction to historical literature through an analysis of European and American historians specializing in European history.*

*HIST 541, 542. SEMINAR IN EUROPEAN HISTORY I, II. (3, 3) A study of Europe in the nineteenth century with emphasis on the cultural developments of Western Europe.*

*Prerequisites: HIST 301, 302 (Foundations of Modern Europe I, II), or equivalents.*

*HIST 551, 552. PROBLEMS IN AMERICAN CONSTITUTIONAL HISTORY I, II. (3, 3) A study of selected problems related to the origin and evolution of the principles, institutions, practices, and laws embodied in the American Constitutional system.*

*HIST 561. SEMINAR IN TWENTIETH-CENTURY BLACK THOUGHT. (3) An intensive study of one of the basic themes of the twentieth-century African-American Revolution: Nationalism vs. Integrationism. The course includes an investigation of selected topics, such as the Washington-DuBois debate, DuBois vs. Garvey vs. Black Communism, Garveyism vs. the NAACP.*

*HIST 571, 572. SEMINAR IN AFRICAN HISTORY I, II. (3, 3) The intensive study of selected social, economic, political, and international relationships of the nations of Africa. First course covers the origin of mankind to the beginnings of European colonization. The second course continues through the present, focussing on the emergence of independent states in the postcolonial period.*

*HIST 575. VITAL TOPICS. (3) Selected subjects on a specific period—local, regional, national, or international in scope. In recent semesters HIST 575 covered the history of Germany from 1918 to 1945, and 575A covered science and technology.*

*HIST 651, 652. SEMINAR IN LATIN-AMERICAN HISTORY I, II. (3, 3) An examination of the colonization, nation-building, and development of Latin America. The first course explores the region to 1900. The second examines Latin America since 1900.*

*HIST 665. ECONOMIC AND SOCIAL HISTORY OF EUROPE, 1815 TO PRESENT. (3) An examination of the economic and social forces, leaders, culture, and politics of Western Europe.*

*HIST 666. HISTORY OF AMERICAN SCIENCE AND TECHNOLOGY. (3) Selected topics and sources in the historical development of modern science and technology in the United States.*

*HIST 668. TWENTIETH-CENTURY DIPLOMATIC HISTORY. (3) Study designed to provide the student with a broad background in twentieth-century diplomatic history of the United States.*

*HIST 671. MODERN AFRICA: POLITICAL AND SOCIAL HISTORY. (3) An investigation of Africa's political and economic development since 1939.*

*HIST 680. SEMINAR IN NEAR AND MIDDLE EASTERN HISTORY. (3) A study of the Arab and non-Arab states in the Middle East since 1920.*

*HIST 687. AFRO-AMERICAN ISSUES, 1775 TO 1876. (3) An examination of the role and contributions of African-Americans to the total American scene. Constitutional, economic, and sociocultural issues are examined through the revisionist approach and the use of new ideas included in recent publications.*

*HIST 688. AFRICAN-AMERICAN ISSUES, 1877 TO PRESENT. (3) Key issues of African-Americans in relation to the majority. Topics include revisionist historical examination of the black soldiers of the Civil War and Reconstruction, black state and national political leaders, the African-American business and industrial workers, black institutions, African-Americans in World Wars I and II, the period of agitation 1920-1954, the socio-economic and political impact of the Brown vs. Topeka case, black revolutionaries of the 1960's, and the aspirations of the present.*

*HIST 690, 691. CONTEMPORARY WORLD HISTORY I, II. (3, 3) A survey of global events in modern times. The first semester explores the modern world through the founding and operation of the League of Nations. The second examines the emergence of non-Western politics, including the work and growth of the United Nations.*

GEOGRAPHY (GEOG)

*GEOG 501. PROBLEMS IN TEACHING GEOGRAPHY. (3) Attention to problem areas in geography. Topics include aims and objectives of the study of geography, proper utilization of instructional aids, and the construction of teaching units.*

*GEOG 502. ENVIRONMENTAL GEOGRAPHY. (3) The concepts of geography applied to the study of environmental problems. Course focuses on environmental problems common to urban areas, using the black community of Nashville as a laboratory.*

*GEOG 503. EARTH SCIENCE FOR TEACHERS. (3) A general introduction to the geosciences designed especially for middle and high school teachers. Course emphasizes the basic concepts and latest developments in geology, ocean studies, weather, and astronomy. Teaching aids, supplementary readings, and laboratory techniques to promote effective teaching of earth science courses are included.*

*GEOG 504. WORLD GEOGRAPHY FOR TEACHERS. (3) A general survey of the geographic regions of the world, designed especially for secondary school teachers. Emphasis is placed on cultures, resources, and physical features, including the oceans. Course includes aids to promote effective teaching of geography courses.*

*GEOG 505. EUROPE: PHYSICAL AND CULTURAL LANDSCAPES. (3) An introduction to the physical and cultural aspects of Europe west of Russia, designed especially for geography, social science, and history teachers. Recent European developments of world importance are emphasized. Course includes aids to promote effective teaching of European geography and history.*

*GEOG 575. DIRECTED READING IN GEOGRAPHY. (3) Designated topics focusing on specialized areas of investigation, allowing students to learn of recent developments in the discipline and participate in intensive research.*

POLITICAL SCIENCE (PISI)

*PISI 501. AMERICAN GOVERNMENT AND POLITICS. (3) An in-depth analysis of the American political system—national, state, and local—for those with no undergraduate background in political science.*

*PISI 513. RESEARCH METHODS. (3) An introduction to the research methods of political science, including data collection, survey research, data analysis, and statistical analysis.*

*PISI 535. SEMINAR IN LEGISLATIVE PROCESS. (3) The structure and methods of transacting business in the American Congress and state legislatures: the role of legislatures in the American political system.*

*PISI 560. SEMINAR IN COMPARATIVE POLITICAL SYSTEMS. (3) Major political systems of the world today—constitutions, structures, sources of power and legitimacy, political cultures, and methods of resolving conflicts.*

#### GRADUATE FACULTY

Reuben H. Brooks, Professor

B.A., 1967, Bemidji State University; Ph.D., 1972, University of Colorado, Boulder

Elizabeth Dachowski, Assistant Professor

B.A., 1984, Indiana University; M.A., 1987, University of Minnesota; Ph.D., 1995, University of Minnesota

Joel H. Dark, Assistant Professor

B.A., 1990, Middle Tennessee State University; M.A., 1991, Vanderbilt University; Ph.D. 1998, Vanderbilt University

Daniel K. Gibran, Associate Professor

B.A., 1976, Middle East College (Lebanon); M.A., 1985, University of Kent (United Kingdom); Ph.D., 1990, University of Aberdeen (Scotland)

Hoyt A. King, Associate Professor

B.A., 1964, Southern University; M.A., 1968, Atlanta University; Ph.D., 1976, West Virginia University

Bobby L. Lovett, Professor

B.A., 1967, Arkansas A.M. and N. College; M.A., 1969, Ph.D., 1978, University of Arkansas

Harrill Coleman McGinnis, Associate Professor

B.A., 1965, University of the South; M.A., 1967, Tulane University; Ph.D., 1970, University of Virginia

John P. Miglietta, Assistant Professor

B.A., 1984, Fordham University; M.A., 1987, New York University; Ph.D., 1995, New York University

Adebayo Oyebade, Assistant Professor

B.A., 1981, University of Ife (Nigeria); M.A., 1985, University of Ife (Nigeria); Ph.D., 1995, Temple University

David Padgett, Assistant Professor

B.S., 1987, Western Kentucky University; M.S., 1992, University of Florida

Jyotsna Paruchuri, Professor

B.A., 1959, Queen Mary College, Madras (India); M.A., 1961, Presidency College, Madras (India); Ph.D., 1981, Agra University (India)

Helen R. Houston, D.A., Interim Head

104 Humanities Building

615-963-5641

FAX 615-963-5725

MAJOR: ENGLISH

DEGREE: MASTER OF ARTS (M.A.)

#### **Jo Helen Railsback, Ph.D., Graduate Coordinator**

Graduate work in English is designed to give the student a rich background in English and American literature, including literature by black authors, and in the nature and principles of the growth of the English language. It also provides a thorough grounding in the methods of research. Every effort is made, in the scheduling of classes, to meet the needs of those students who teach or are engaged in other occupations in the immediate area.

The Department offers several paths to the degree to meet the varying needs and interests of its students. Some of these alternatives are appropriate for students for whom the M.A. will be the final degree, and some are appropriate for students who plan to work on a doctorate. In addition, candidates for the M.A. may take a minor in a field related to their own.

#### **Admission Requirements**

Unconditional admission to the M.A. program requires the applicant to have a bachelor's degree from a fully accredited four-year college or university, an undergraduate cumulative grade point average of 2.5 or better on a 4.0 scale, and a composite score of at least 870 on the verbal, quantitative, and subject portions of the Graduate Record Examination or a score of 25 on the Miller Analogies Test.

Conditional admission may be gained with a lower grade point average, but the GRE or MAT score must be correspondingly higher. If the undergraduate GPA is between 2.25 and 2.49, the GRE score must be 935 or the MAT score 32. If the GPA is between 2.0 and 2.24, the GRE score must be 1,000 or the MAT score 39. Applicants with less than a 2.5 undergraduate GPA must submit test scores at the time of application; applicants with a GPA of 2.5 or above may submit test scores in the first semester of attendance, but it is preferable that they submit test scores at the time of original application. The student must remove conditional status by

earning at least a B (3.0) average in the first nine hours of graduate courses; failure to achieve this average will result in withdrawal from the program.

In addition, the student must have completed at least 24 hours of English at the undergraduate level, 12 of which must be at the junior or senior level. In some instances, conditional admission may be granted prior to completion of these undergraduate course requirements, but a student must complete these courses before taking any graduate courses.

## Degree Requirements

### 1. Course Requirements

English majors are required to take thirty hours of course work, at least twenty-one of which must be within the Department. English 511 is the only course required of all majors.

#### A. Required Course

ENG 511

Bibliography and Method 2

#### B. Electives: 21 to 28 hours with the consent of the advisor.

ENG 502A, B

Independent Study 1-3

ENG 505

Composition and Computers

ENG 508

in Literary Studies 3

ENG 509

Critical Papers 1

ENG 510

Linguistics and the English Language

ENG 512

3

ENG 513, 514,

History of the English Language 3

515

Thesis Writing 4

ENG 520

Teaching English to Speakers of

ENG 521

Another Language 3, 3, 3

ENG 522

Chaucer 3

Literature of the Middle Ages 3

English Drama and Dramatic Criticism,

3

ENG 523

1660-1784

ENG 530

Studies in European Drama 3

Studies in English Renaissance

Literature

ENG 532

Studies in Shakespeare 3

ENG 533

Studies in the Age of Reason 3

ENG 534

Studies in the Age of Sensibility 3

ENG 541

Studies in English Romanticism 3

ENG 542

Studies in the Victorian Age 3

ENG 561

Studies in American Literature, 3

1600-1800

ENG 562

Studies in American Literature, 3

1800-1900

ENG 563

Studies in American Literature, 3

1900-Present

ENG 565

Studies in Black American Literature,

3

Beginnings to 1940

ENG 566

Studies in Black American Literature,

3

1940 to Present

ENG 570

The Modern Novel 3

ENG 590

Literary Criticism 3

ENG 600A, B

Special Topics in Literature I, II 3,3

ENG 601

Creative Writing 3

ENG 602

Project Writing 2

ENG 613

Research in English Education 3

ENG 615

Teaching Literature in a Diverse Society

3

Teaching Adolescent Literature 3

ENG 616

Studies in Twentieth-Century Poetry

ENG 651

3

Studies in Twentieth-Century Prose

ENG 652

3

Studies in American Literary Thought

ENG 662

3

Seminar in the Harlem Renaissance

ENG 665

3

Major African Writers3

ENG 680

Apprenticeship in Teaching College

ENG 690

3

English

Note: Twelve hours of 600-level English courses may be chosen as electives by doctoral students majoring in Curriculum with the concentration, Curriculum Planning. This Ed.D. program is offered through the Department of Teaching and Learning in the College of Education.

## 2. Language Requirement

The language requirement may be satisfied in any of the following ways:

1. Passing a written examination in French, Spanish, or German, administered by the faculty in Foreign Languages;
2. Completing two years, with a minimum grade of C, of a single foreign language in undergraduate school;
3. Passing ENG 505, ENG 509, or ENG 510. The three hours earned do not count toward the minimum of thirty hours required for the degree if the student applies one of these courses toward the language requirement.

### 3. Final Writing Project

The Department offers three choices for the final writing project. The appropriate course must be taken for each option. See course descriptions.

1. A thesis, requiring ENG 512 (4 hours)
2. A project in the teaching of English language or literature, requiring ENG 602 (2 hours)
3. Three critical papers, requiring ENG 508 (1 hour)

## Program of Study

The degree candidate must file a program of study after completing at least nine semester hours of graduate study but no more than fifteen hours. The program of study lists the courses which will be used to satisfy degree requirements, as well as detailing how other requirements will be met. The student may later change the program of study with the written approval of the Department and the Graduate School.

## Admission to Candidacy

The individual must file for admission to candidacy at the same time he or she submits the program of study. The candidate must have a grade point average of 3.0 or above to be eligible for admission to candidacy.

## Other Work Beyond the Master's Degree

Public school teachers in Tennessee may rise to a higher salary level by completing thirty hours of course work beyond the master's degree. The Department participates in the program and offers work appropriate to this purpose.

## FOREIGN LANGUAGES

Foreign Languages does not offer a graduate degree. It does, however, offer occasional graduate courses to meet the needs of those who desire to become better trained teachers, to prepare for advanced degrees, or to satisfy degree requirements for other programs in the University. The curricula in French, Spanish, and Modern Foreign Languages are to be found under the course descriptions.

## DESCRIPTION OF COURSES

### ENGLISH (ENG)

*ENG 502A, B. INDEPENDENT STUDY. (1-3) Individual study and research under faculty guidance, resulting in a substantial piece of writing. This course may be taken only in addition to the writing requirements for the M.A. degree: i.e., the research and writing cannot be used to satisfy the requirements of three master's papers, the education project, or the thesis. Prerequisite: permission of the Department Head or graduate coordinator. May be repeated once by permission for a maximum of three hours.*

*ENG 505. COMPOSITION AND COMPUTERS IN LITERARY STUDIES. (3) A course designed to improve the teaching of composition at all levels and to incorporate the fundamentals of electronic communication, including word processing, electronic mail, and electronic filing. Course includes fundamentals of computer-assisted instruction and a survey of research capabilities of computers in literature and language. Course may be used to satisfy the language requirement in English, in which case it does not provide hours toward the degree.*

*ENG 508. CRITICAL PAPERS. (1) Preparation of three scholarly papers as a final writing project for the master's degree. Each paper is written under the direction of a graduate English professor under whom the student has studied; the paper must be approved by a committee of graduate faculty from the Department. Required of all students who elect the paper option.*

*ENG 509. LINGUISTICS AND THE ENGLISH LANGUAGE. (3) A course designed to help students achieve a degree of linguistic consciousness conducive to developing an objective view of their native tongue, of language generally, and of language learning. Course may be used to satisfy the language requirement in English, in which case it does not provide hours toward the degree.*

*ENG 510. HISTORY OF THE ENGLISH LANGUAGE. (3) A study of the phonetic, grammatical, and lexical components of English, with emphasis on the development of American dialects. Course may be used to satisfy the language requirement in English, in which case it does not provide hours toward the degree.*

*ENG 511. BIBLIOGRAPHY AND METHOD. (2) A course in methods and materials for the study of English language and literature. Required of all M.A. candidates in English.*

*ENG 512. THESIS WRITING. (4) Research and writing under the supervision of thesis director. Required of all students who write a thesis. Once students have registered for this course, they must re-enroll in it every semester until they complete the thesis and are examined over it.*

*ENG 513, 514, 515. TEACHING ENGLISH TO SPEAKERS OF ANOTHER LANGUAGE. (3, 3, 3) The study and application of the principles of modern linguistic science and recent research in the teaching of English to speakers of another language.*

*ENG 520. CHAUCER. (3) Study in the works of Geoffrey Chaucer, with the emphasis on the Canterbury Tales. Course also includes attention to the medieval cultural background.*

*ENG 521. LITERATURE OF THE MIDDLE AGES. (3) Studies in the prose and poetry of the Middle Ages, including selections from major works of the Old and Middle English periods, exclusive of Chaucer.*

*ENG 522. ENGLISH DRAMA AND DRAMATIC CRITICISM, 1660 TO 1784. (3) The study of dramatic literature from the reopening of the theatres in 1660 through the eighteenth century, with a concentration on the Restoration comedy of manners.*

*ENG 523. STUDIES IN EUROPEAN DRAMA. (3) The study of major playwrights of the last two centuries, emphasizing the drama of social criticism, symbolic drama, and the experimental drama.*

*ENG 530. STUDIES IN ENGLISH RENAISSANCE LITERATURE. (3) A study of the major poets and prose writers from 1603 to 1660: the Cavaliers, the Metaphysicals, Bacon, Burton, Browne, Hobbes, the character writers, and the biographers.*

*ENG 532. STUDIES IN SHAKESPEARE. (3) Problems in major dramatic works, with possible attention to the nondramatic works, especially the sonnets.*

*ENG 533. STUDIES IN THE AGE OF REASON. (3) A survey of British literature of the early eighteenth century, including figures such as Swift, Dryden, Pope, Defoe, and Richardson.*

*ENG 534. STUDIES IN THE AGE OF SENSIBILITY. (3) Survey of English literature from 1745 to 1798, including both British and American figures such as Fielding, Johnson, Franklin, Boswell, Sheridan, Goldsmith, and Blake, as well as schools such as the graveyard poets and Gothic revivalists. The course may also consider continental literary influences such as Rousseau, Diderot, and Voltaire.*

*ENG 541. STUDIES IN ENGLISH ROMANTICISM. (3) An examination of the major poets and prose writers.*

ENG 542. *STUDIES IN THE VICTORIAN AGE*. (3) *A study of writers of nonfictional prose, poets, and novelists, from the accession of Queen Victoria until 1900.*

ENG 561. *STUDIES IN AMERICAN LITERATURE, 1600-1800*. (3) *An examination of writers from the first English settlements to the establishment of national independence. Emphasis is on the Puritan mind, culminating in the writing of Jonathan Edwards, on the mind of the Enlightenment, culminating in the writers of the American Revolution, and on the rise of an imaginative literature.*

ENG 562. *STUDIES IN AMERICAN LITERATURE, 1800 TO 1900*. (3) *A consideration of special themes or topics covering a limited number of writers rather than a survey of the entire period.*

ENG 563. *STUDIES IN AMERICAN LITERATURE, 1900 TO PRESENT*. (3) *A consideration of special themes or topics covering a limited number of writers rather than a survey of the entire period.*

ENG 565. *STUDIES IN BLACK AMERICAN LITERATURE, BEGINNINGS TO 1940*. (3) *A review of literature written by black Americans, from inception to World War II. Such writers as Chesnut, Dunbar, Johnson, Hughes, McKay, Cullen, Toomer, Larsen, Hurston, Brown, and Wright are studied.*

ENG 566. *STUDIES IN BLACK AMERICAN LITERATURE, 1940 TO PRESENT*. (3) *A chronological study of black writers since the beginning of World War II. Such writers as Ellison, Baldwin, Baraka, Brown, Angelou, and Morrison are considered.*

ENG 570. *THE MODERN NOVEL*. (3) *A tracing of the development of the novel in English through its various historical periods and modes. The course deals with representative texts from several periods to illustrate the changes in the form.*

ENG. 590. *LITERARY CRITICISM*. (3) *A course which follows the development of criticism of literature, beginning with Aristotle and other classical texts and continuing to the present day.*

ENG 600A, B. *SPECIAL TOPICS IN LITERATURE*. (3-6) *Study of a specific period, author(s), or topic chosen in response to the needs of students in the program. The course may be repeated once for a maximum of six semester hours combined.*

ENG 601. *CREATIVE WRITING*. (3) *A course in the writing of various forms of literature—fiction, drama, poetry—as well as the reading and analysis of literature by established masters of the genres.*

ENG 602. *PROJECT WRITING*. (2) *The devising and development of a project in the teaching of English language or literature, under the supervision of an individual faculty member. Required of all students who do a project. Once students have registered for this course, they must re-enroll in it every semester until they complete the project and are examined over it.*

ENG 613. *RESEARCH IN ENGLISH EDUCATION*. (3) *An investigation of current research in the teaching of composition, language, and literature.*

ENG 615. *TEACHING LITERATURE IN A DIVERSE SOCIETY*. (3) *A study of literatures of various groups represented in the elementary, middle, and senior high school curriculum.*

ENG 616. *TEACHING ADOLESCENT LITERATURE*. (3) *An introduction to literature which addresses the concerns and problems of young adults, as seen from their point of view. Techniques for teaching such literature constitute part of the course.*

*ENG 651. STUDIES IN TWENTIETH-CENTURY POETRY. (3) A study of twentieth-century poets, variously selected each term.*

*ENG 652. STUDIES IN TWENTIETH-CENTURY PROSE. (3) A study of twentieth-century novelists, essayists, and/or dramatists, variously selected each term.*

*ENG 662. STUDIES IN AMERICAN LITERARY THOUGHT. (3) A consideration of the intellectual, social, political, economic, and historical trends which have strongly influenced literary and popular thought. The class may focus on a limited period of time, such as the Civil War, the 1920s, or the Depression, or it may trace the historical development of characteristic concerns and attitudes over a longer period of time. Course may include texts from various artistic and intellectual disciplines (history, religion, social criticism, philosophy, the visual arts) and such figures as Darwin, Marx, Freud, and Frazier.*

*ENG 665. SEMINAR IN THE HARLEM RENAISSANCE. (3) Study and analysis of the historical forces that gave rise to a literary movement known as the Harlem Renaissance.*

*ENG 680. MAJOR AFRICAN WRITERS. (3) A study in depth of selected African writers, with an analysis of their major themes as these relate to the emergence of modern Africa. Writers vary from one semester to another.*

*ENG 690. APPRENTICESHIP IN TEACHING COLLEGE ENGLISH. (3) A course designed to allow graduate students to assist a college English instructor in the teaching of a freshman composition course. The instructor guides the student in the preparation of lessons, techniques of evaluation, and conferring with students. The professor in charge of this course holds weekly sessions in which concerns are addressed, advice and assistance are given, and discussions of pedagogical issues are conducted.*

FRENCH (FR)

*FR 501, 502. ORAL FRENCH I, II. (3, 3) Conversational drill using practical and technical vocabulary, with emphasis on the acquisition of communicative competence.*

*FR 510. PHONETICS AND DICTION. (3) The theory of French sounds and their phonetic transcription. Course includes practice in spoken French, rhythm, articulation, intonation, and voice in prose and verse.*

*FR 521, 522. ADVANCED COMPOSITION AND CONVERSATION I, II. (3, 3) Intensive drill in French conversation on contemporary topics, accompanied by discussions and exercises on syntax and composition.*

MODERN FOREIGN LANGUAGES (MFL)

*MFL 520. THE TEACHING OF FOREIGN LANGUAGES. (3) Current issues, trends, theories, and practices in teaching foreign languages.*

*MFL 650. METHODS INSTITUTE. (4) An intensive program for foreign language teachers. Topics include examination of traditional methods, with emphasis on the learning of new, practicable techniques for teaching French and Spanish. Course also demonstrates the use of a variety of materials and equipment.*

SPANISH (SPN)

*SPN 501, 502. ORAL SPANISH I, II. (3, 3) Conversational drill using practical and technical vocabulary, with emphasis on the acquisition of communicative competence.*

*SPN 510. PHONETICS AND DICTION. (3) Nuances in the Spanish sound system, phonetic transcription, and drill in prose and verse intonation.*

*SPN 521, 522. ADVANCED COMPOSITION AND CONVERSATION I, II. (3, 3) Modern idiomatic usage through exercises in grammar and oral and written composition.*

GRADUATE FACULTY

James L. Head, Professor  
 B.A., 1964, M.A., 1966, Texas Christian University; Ph.D., 1977, George Peabody College for Teachers  
 Helen R. Houston, Professor  
 B.A., 1960, Bennett College; M.A., 1967, Scarritt College; M.A., 1968, Colorado State University; D.A., 1978, Middle Tennessee State University  
 Jocelyn Adkins Irby, Associate Professor  
 B.A., 1969, Bennett College; M.S., 1971, Fort Valley College; M.A., 1990, Tennessee State University; Ph.D., 1996, Southern Illinois University  
 Gloria C. Johnson, Professor and Department Head  
 B.A., 1970, Tennessee State University; M.A., 1971, University of Illinois; Ph.D., 1990, University of Tennessee  
 Lynn C. Lewis, Assistant Professor  
 B.A., 1974, Earlham College; M.A., 1979, Tennessee State University, M.B.A., 1983, Columbia University; Ph.D., 1999, University of Missouri  
 Marc R. Mazzone, Assistant Professor  
 B.A., 1974, Williams College; M.A., 1987, Ph.D., 1993, Indiana University  
 Carolyn S. Moran, Assistant Professor  
 B.A., 1964, New Mexico State University; M.A.T., 1976, Tulane University; Ph.D., 1996, University of Kansas  
 Lucas A. Powers, Associate Professor  
 B.A., 1984, M.A., 1986, University of North Carolina; Ph.D., 1990, Vanderbilt University  
 Elaine A. Phillips, Assistant Professor  
 B.A., 1989, Vassar College; M.F.A., 1992, Arizona State University; M.A., 1993, Ph.D., 1996, Vanderbilt University  
 Jo Helen Railsback, Professor and Coordinator of the Graduate Program in English  
 B.A., 1956, Baylor University; M.A., 1957, University of Arkansas; Ph.D., 1969, University of Tennessee  
 Louise W. Watkins, Professor  
 B.S., 1956, M.A., 1969, Memphis State University; Ph.D., 1986, Vanderbilt University

Ralph R. Simpson, Ph.D., Head  
 123 Marie Brooks Strange Music Building  
 615-963-5341  
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**MAJOR: MUSIC EDUCATION**  
**DEGREE: MASTER OF SCIENCE (M.S.)**

Graduate study in music education is open to applicants who have satisfactorily completed a bachelor's degree in music or music education and who meet all other requirements for admission to teacher education programs and to the Graduate School. The purposes of the graduate program are to advance knowledge in the areas of music instruction through scholarly research and to broaden specific aspects of the art and science of teaching music through study of established practices and new trends.

**Admission Requirements**

Unconditional admission to the M.S. program requires the student to have a bachelor's degree from a fully accredited four-year college or university, an undergraduate cumulative grade point average of 2.5 or better on a 4.0 scale, and a score of at least 25 on the Miller Analogies Test (MAT).

Conditional admission may be gained with a lower grade point average, but the MAT score must be correspondingly higher. If the undergraduate GPA is between 2.25 and 2.49, the MAT score must be at least 32. If the GPA is between 2.0 and 2.24, the MAT score must be at least 39. Students with an undergraduate GPA of less than 2.5 must submit the MAT score at the time of application; students with a GPA of 2.5 or above may submit the test score in the first semester of attendance, but it is preferable that they submit the score at the time of original application. The student must remove conditional status by earning at least a B (3.0) average in the first nine hours of graduate courses; failure to achieve this average will result in withdrawal from the program.

The bachelor's degree earned by an applicant must be substantially the same in content and experience as the undergraduate curriculum in Music Education at Tennessee State University. Any differences may be construed as undergraduate deficiencies which must be made up before taking any graduate courses.

**Degree Requirements**

The Master of Science degree requires thirty-one semester hours of graduate course work, including MUS 512 Thesis Writing or MUS 602 Project Writing. The degree also requires a comprehensive written examination and a final oral examination; the examinations cover music theory, music history, conducting, and the major performance area.

Students must complete all of Core A (Education) and Core B (Music). The remaining hours are to be elected from Groups I, II, and III, but at least one course must be elected from each group.

**1. Required Courses**

**A. Professional Education Core: 12 hours**

EDAD 502	Philosophy of and Introduction to School 3
EDAD 503	Administration Supervision and Improvement of Instruction 3
EDAD 511	Research and Statistics in Education 3

EDCI 526	Philosophy of Education	3
<b>B. Core Courses in Music: 11 or 13 hours</b>		
MUS 500	Introduction to Graduate Study in Music Education	3
MUS 512	Thesis Writing	4
or	or	
MUS 602	Project Writing	2
MUS 525	Seminar in Music Education	3
MUS 532	Theory Review	3
<b>2. Electives in Music and/or Music Education: 10 to 14 hours with permission of advisor</b>		
<b>Group I: Music Education (one course)</b>		
MUS 051	Applied Music	2
MUS 501	Advanced Vocal Methods	3
MUS 506	Psychology of School Music Teaching	3
MUS 510	Instrumental Methods and Materials	3
MUS 524	Band Pageantry	3
MUS 527	Supervision of School Music	3
<b>GROUP II: Music Theory (one course)</b>		
MUS 528	Physics of Music	3
MUS 534	Harmonic Counterpoint	3
MUS 552	Special Topics	3
<b>GROUP II: Musicology (one course)</b>		
MUS 507	The Symphony	3
MUS 508	The Opera	3
MUS 509	Twentieth-Century Music	3

#### Program of Study

The degree candidate must file a program of study after completing at least nine semester hours of graduate study but no more than fifteen hours. The program of study lists the courses which will be used to satisfy degree requirements, as well as detailing how other requirements will be met. The student may later change the program of study with the written approval of the Department and the Graduate School.

#### Admission to Candidacy

The individual must file for admission to candidacy at the same time he or she submits the program of study. The candidate must have a grade point average of 3.0 or above to be eligible for admission to candidacy.

#### DESCRIPTION OF COURSES

*MUS 051. APPLIED MUSIC. (2) Graduate study covering standard literature, technical proficiency, and performance trends on one's instrument or in voice. MUS 051A is Fifth-Year Piano and MUS 051B is Fifth-Year Voice. Prerequisite: audition.*

*MUS 500. INTRODUCTION TO GRADUATE STUDY IN MUSIC EDUCATION. (3) A concentrated survey of bibliographical material, current periodical literature, library resources, and research techniques applicable to graduate study in music education. Required of all degree candidates. Three lectures.*

*MUS 501. ADVANCED VOCAL METHODS. (3) A detailed study of vocal problems found in public schools: methods, materials, and problems of organization. Other topics include psychological and physiological problems in the teaching of voice production: diagnosis, breath control, resonance, diction, repertory, and interpretation. Three lectures.*

*MUS 506. THE PSYCHOLOGY OF SCHOOL MUSIC TEACHING. (3) The relationship of psychological research to practical applications in music education. Topics include the relationship of the learning process to music education, the relationship of the learning process to music learning, executive factors in music education, evaluation, tests, and measurements. Three lectures.*

*MUS 507. THE SYMPHONY. (3) An historical background of the growth and development of the modern symphony orchestra, along with a critical study of symphonic literature.*

*MUS 508. THE OPERA. (3) A study of operas illustrating the basic types, including history and analysis of operatic literature. Recorded music and actual singing of scores illustrate the discussion. Three lectures.*

*MUS 509. TWENTIETH-CENTURY MUSIC. (3) A survey of modern music. Selected composers of the period are discussed, and stylistic and formalistic analysis of representative work is required.*

*MUSIC 510. INSTRUMENTAL METHODS AND MATERIALS. (3) A detailed study of instrumental problems met in public schools: methods, materials, and problems or organization. Discussion of financing, instrument testing, storage and repair, rehearsal techniques, and other problems relating to the work of the instrumental director. Three lectures.*

*MUS 512. THESIS WRITING. (4) The writing and oral defense of a thesis. The adequate set-up of the problem, the collection of data, the use of data, and the conclusions to be reached are emphasized. Required of all degree candidates, unless Department Head approves a project in individual cases. Once students enroll in this course, they must continue to enroll in it until they complete the thesis and are examined over it.*

*MUS 524. BAND PAGEANTRY. (3) An intensive study of problems unique to the marching band: rudimentary techniques for the drum major; problems of cadence, alignment, and formations; and selecting and scoring music for maneuvers and stunts. Three lectures.*

*MUS 525. SEMINAR IN MUSIC EDUCATION. (3) A survey of research studies and an evaluation of current methods in music education. Topics include criteria for selecting materials and classroom procedure, as well as review and criticism of philosophies and curricula in music education. Required of all degree candidates. Three lectures.*

*MUS 527. SUPERVISION OF SCHOOL MUSIC. (3) An analysis and evaluation of principles, practices, and trends in the organization, administration, and supervision of music education in public school systems. Three lectures.*

*MUS 528. PHYSICS OF MUSIC. (3) Theoretical and applied consideration of sound production and promulgation, the tempered scale and other scales, the acoustical bases of wind and string instruments, the analysis of complex tones produced by the human voice and certain wind instruments.*

*MUS 532. THEORY REVIEW. (3) Comprehensive review of common practice theory. Analysis of representative compositions of major historical periods and of all major forms and related techniques and styles. Required of all degree candidates. Three lectures.*

*MUS 534. HARMONIC COUNTERPOINT. (3) An intensive study of the works of the Baroque Era employing contrapuntal techniques. Three lectures.*

*MUS 552, 552A, 552B. SPECIAL TOPICS. (3) Individual research on subjects agreed upon by student and professor. Course may be substituted for required courses upon recommendation of Department Head. Written document required.*

*MUS 602. PROJECT WRITING. (2) Action research on a school or classroom problem. A scholarly document, which may be descriptive or experimental, is required. The project may also take the form of a public performance, but a written document is still required. Prerequisite: permission of Department Head.*

#### GRADUATE FACULTY

Edward L. Graves, Associate Professor

B.S., 1962, Tennessee State University; M.S., 1965, University of Illinois

Darryl G. Nettles, Assistant Professor  
 B.F.A., 1983, State University of New York at Buffalo; M.M., 1987, D.M.A., 1995, University of Illinois  
 Christine M. Perkey, Associate Professor  
 B.M., 1974, Augusta College; M.M., 1975, University of South Carolina; D.M.A., 1981, Southern Baptist Theological Seminary  
 Ralph R. Simpson, Professor and Department Head  
 B.S., 1952, Alabama State University; M.A., 1957, Columbia University; Ph.D., 1964, Michigan State University

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MAJOR: MATHEMATICAL SCIENCES  
 DEGREE: MASTER OF SCIENCE (M.S.)

Kothandaraman Ganesan, Ph.D., Graduate Coordinator

The Department of Physics and Mathematics offers the Master of Science degree in the Mathematical Sciences with areas of emphasis in mathematics (M) and mathematics for teachers (MT). The purpose of these programs is to educate students in the mathematical knowledge and techniques increasingly important for a technological society and to prepare teachers capable of passing this knowledge on to others. The master's degree represents from one to two academic years of full-time study beyond an acceptable bachelor's degree. The specific plan of study must be filed with the Graduate Mathematics Curriculum Committee (GMCC) in the first semester of graduate enrollment.

#### Admission Requirements

Each applicant for admission must meet all entrance requirements of the Graduate School and be recommended by the GMCC of the Department. In admitting students, this committee considers the undergraduate cumulative grade point average, the grade point average in the Mathematics courses, references (at least two letters from mathematicians), and the scores on the General Test (verbal, quantitative, and analytical) of the Graduate Record Examination. The minimal requirements for unconditional admission include a bachelor's degree from a fully accredited four-year college or university with a Mathematics major or the equivalent. In addition, the applicant must have the following:

1. **a 2.6 cumulative GPA, or a 3.0 GPA in the major courses on a 4.0 system; and**
  2. **a score of 900 calculated from the formula (125 GPA + score on the quantitative portion of the GRE General Test).**
- Applicants may receive conditional admission if they fall short of these criteria, if the GMCC believes there are compensating factors, such as very high recommendations or promising scores on the verbal and analytical sections of the GRE General Test. Students must remove the conditional status by earning at least a B (3.0) average on the first nine hours of graduate courses; failure to achieve this average will result in withdrawal from the program.

#### Degree Requirements

In addition to successfully completing thirty-seven semester hours of course work, each degree candidate must pass:

1. a general examination in computer proficiency,
2. a written comprehensive examination on the core requirements for the candidate's area of emphasis, and
3. an oral defense of the thesis.

#### 1. Mathematics for Teachers (MT)

The degree program with the area of emphasis mathematics for teachers (MT) requires thirty-seven semester hours of course work: twenty-eight hours of required courses, including four hours of thesis-writing, and three electives chosen with the permission of the advisor.

A computer science component is available in the MT area of emphasis for the student having sufficient background in mathematics and/or computer science, the specific plan of study to be worked out jointly by the student and the GMCC.

Required Courses for MT Emphasis: 28 hours

MATH 501	Introduction to Number Theory	3
MATH 502	Abstract Algebra	3
MATH 505	Intermediate Analysis	3
MATH 506, 507	Linear Algebra I, II	3,3
MATH 508	Geometry	3
MATH 509, 510	Advanced Calculus I, II	3,3
MATH 512	Thesis	4
Electives: 9 hours, with permission of the advisor		
MATH 573, 574	Logic I, II	3,3
MATH 575	History of Mathematics	3

Other electives: All 500- and 600-level mathematics courses (except MATH 571); graduate courses in statistics, physics, computer science (except CS 500, 501, and 505); and engineering, with the permission of the GMCC.

A student may strengthen his or her program by making appropriate substitutions of more rigorous courses with the permission of the GMCC.

#### 2. Mathematics (M)

The degree program with area of emphasis in mathematics (M) requires thirty-seven semester hours of course work; twenty-two hours of required courses, including four of thesis writing, and fifteen hours of suggested electives chosen with the permission of the advisor. MATH 501, 502, 505, 506, 507, 508, 509, 510, 571; CS 500, 501, and 505; and STAT 501, 502, and 507 do not count in the Master of Science in the Mathematical Sciences program with the mathematics (M) emphasis.

Required Courses for M Emphasis: 22 hours

MATH 512	Thesis	4
MATH 531	Topology I3	
MATH 551	Real Analysis I	3
MATH 553	Complex Analysis I	3
MATH 564	Modern Algebra I	3

At least two of the following courses:

MATH 532	Topology II	3
MATH 552	Real Analysis II	3
MATH 554	Complex Analysis II	3
MATH 565	Modern Algebra II	3

Suggested Electives: 15 hours with permission of advisor

MATH 556, 557	Differential Equations I, II	3,3
MATH 561, 562	Linear Spaces I, II	3,3
MATH 573, 574	Logic I, II	3,3
MATH 590	Special Topics	3-6
MATH 651, 652	Functional Analysis I, II	3,3
MATH 664, 665	Group Theory I, II	3,3
MATH 667, 668	Combinatorial Analysis I, II	3,3
CS 561, 562	Mathematical Modeling I, II	3,3
CS 643, 644	Numerical Analysis and Approximation	

3,3

STAT 521, 522	Theory I, II	
STAT 621	Statistical Methods I, II	3,3
STAT 622	Analysis of Categorical Data	3
	Applied Regression Analysis and 3	
	Other Multivariable Methods	

Other electives: Graduate courses in physics, engineering, and economics, with permission of the GMCC.

A student may strengthen her or his program by making substitutions of more appropriate courses with permission of the GMCC.

#### Program of Study

The degree candidate must file a program of study after completing at least nine semester hours of graduate study but no more than fifteen hours. The program of study lists the courses which will be used to satisfy degree requirements, as well as detailing how other requirements will be met. The student may later change the program of study with the written approval of the Department and the Graduate School.

#### Admission to Candidacy

The individual must file for admission to candidacy at the same time he or she submits the program of study. The candidate must have a grade point average of 3.0 or above to be eligible for admission to candidacy.

#### DESCRIPTION OF COURSES

##### MATHEMATICS (MATH)

*MATH 501. INTRODUCTION TO NUMBER THEORY. (3) Divisibility properties for the integers, the greatest common divisor, unique factorization, congruences, diophantine equations, the Euler function, Wilson's theorem, the Chinese remainder theorem, and other elementary properties of numbers. Prerequisite: MATH 164 (Calculus II) or permission of the GMCC. Required of all students in the mathematics for teachers (MT) emphasis. Course may not be applied to the degree with the mathematics (M) emphasis.*

*MATH 502. ABSTRACT ALGEBRA. (3) An introduction to the properties of groups, rings, integral domains, and fields. Prerequisites: MATH 164 (Calculus II) and 501, or permission of the GMCC. Required of all students in the mathematics for teachers (MT) emphasis. Course may not be applied to the degree with the mathematics (M) emphasis.*

*MATH 505. INTERMEDIATE ANALYSIS. (3) A study of the foundations of real variable calculus, including the definitions, algebra, and topology of the real numbers, limits, sequences, convergence, continuity, the intermediate value theorem, and differentiability. Prerequisite: MATH 164 (Calculus II) or permission of the GMCC. Required of all*

*students in the mathematics for teachers (MT) emphasis. Course may not be applied to the degree with the mathematics (M) emphasis.*

*MATH 506. LINEAR ALGEBRA I. (3) Homogeneous and non-homogeneous systems, matrix algebra, determinants, vector spaces and sub-spaces, bases, linear transformations, and rank. Prerequisite: MATH 164 (Calculus II) or permission of the GMCC. Required of all students in the mathematics for teachers (MT) emphasis. Course may not be applied to the degree with the mathematics (M) emphasis.*

*MATH 507. LINEAR ALGEBRA II. (3) A continuation of MATH 506. Topics include orthogonal bases, linear transformations, and similarity theory. It is strongly recommended that MATH 506 and 507 be taken sequentially. Prerequisite: MATH 506 or the equivalent. Required of all students in the mathematics for teachers (MT) emphasis. Course may not be applied to the degree with the mathematics (M) emphasis.*

*MATH 508. GEOMETRY. (3) Brief review of Euclidean geometry with further topics, including the non-Euclidean, projective, and fractal geometries. Prerequisite: MATH 164 (Calculus II) or permission of the GMCC. Required of all students in the mathematics for teachers (MT) emphasis. Course may not be applied to the degree with the mathematics (M) emphasis.*

*MATH 509, 510. ADVANCED CALCULUS I, II. (3, 3) Functions of several variables, the algebra and topology of  $n$ -space, differentials, extrema, the gradient, line, surface and volume integrals, Stokes' theorem, the inverse mapping theorem, the implicit function theorem, the change-of-variable theorem, and manifolds. Prerequisites: MATH 351 (Intermediate Analysis), 505, and 506, or the equivalent. Both courses required of all students in the mathematics for teachers (MT) emphasis. Courses may not be applied to the degree with the mathematics (M) emphasis.*

*MATH 512. THESIS. (4) Individual in-depth research on a topic chosen in collaboration with the advisor. Required of all degree candidates. Once students have registered for this course, they must re-enroll in it every semester until they complete the thesis and are examined over it.*

*MATH 531, 532. TOPOLOGY I, II. (3, 3) First semester: homeomorphisms, connectedness, compactness, metric spaces, normal spaces, Urysohn's lemma, Tietze's theorem, separation axioms, product topology, quotient spaces. Second semester: an introduction to homotopy theory and algebraic topology. Prerequisites: MATH 351 (Intermediate Analysis), or permission of the GMCC. MATH 531 required of all candidates for the degree with the mathematics (M) emphasis.*

*MATH 551, 552. REAL ANALYSIS I, II. (3, 3) Continuous functions, uniform convergence, measure and integration, Lebesgue measure and integrals, convergence theorems,  $L_p$ -spaces, Banach spaces, differentiation, Radon-Nikodym theorem, Fubini's theorem. Prerequisite: MATH 442 (Advanced Calculus II) or permission of the GMCC.*

*MATH 551 required of all candidates for the degree with the mathematics (M) emphasis.*

*MATH 553, 554. COMPLEX ANALYSIS I, II. (3, 3) Analytic functions, Cauchy's integral theorem, Taylor and Laurent series, singularities, residue theory, analytic continuation, conformal mapping, Riemann surfaces, infinite products, and entire functions.*

*Prerequisite: MATH 442 (Advanced Calculus II) or permission of the GMCC. MATH 553 required of all candidates for the degree with the mathematics (M) emphasis.*

*MATH 556, 557. DIFFERENTIAL EQUATIONS I, II. (3, 3) First- and second-order equations, general theory of linear  $n$ th-order differential equations, constant co-efficient*

systems, variation of parameters, infinite series, singular solutions, asymptotic solutions, Green's function, stability, special functions, and the Laplace transform. Prerequisites: MATH or ENGR 303 (Applied Mathematics), and MATH 361 (Linear Algebra I), or permission of the GMCC.

MATH 561, 562. LINEAR SPACES I, II. (3, 3) Fields, vector spaces, quotient spaces, linear transformations, ring theory, similarity, equivalence and congruence of matrices, bilinear forms, tensors, and other topics. Prerequisites: MATH 362 (Linear Algebra II) and 364 (Abstract Algebra), or permission of the GMCC.

MATH 564, 565. MODERN ALGEBRA I, II. (3, 3) Equivalence relations, mappings, groups, rings, fields, polynomial rings, modules, vector spaces, and Galois theory. Prerequisites: MATH 321 (Introduction to Number Theory), 361 (Linear Algebra I), and 364 (Abstract Algebra), or permission of the GMCC. MATH 564 required of all candidates for the degree with the mathematics (M) emphasis.

MATH 571. TEACHING MATHEMATICS IN SECONDARY SCHOOL. (3) Lectures, discussions, and reports on materials and methods used in the instruction of mathematics at the junior and senior high school level. Prerequisite or parallel: field experience. Course may not be applied to either degree program (MT or M).

MATH 573, 574. LOGIC I, II. (3, 3) An introduction to mathematical logic. Logic I is a survey of the fundamental material, including the statement calculus and an informal treatment of predicate calculus. Logic II includes a formal treatment of the predicate calculus, Godel's incompleteness theorem, and undecidability. Prerequisite: MATH 264 (Calculus IV) or permission of the GMCC.

MATH 575. HISTORY OF MATHEMATICS. (3) The origin and development of mathematical ideas, beginning with geometry and algebra and continuing through selected topics in modern mathematics. Prerequisite: MATH 264 (Calculus IV) or permission of the GMCC.

MATH 590. SPECIAL TOPICS. (3) Special topics in mathematics, to be offered with permission of the GMCC in response to the preference and needs of the students. Repeatable to six hours.

MATH 651, 652. FUNCTIONAL ANALYSIS I, II. (3, 3) Topological spaces, Hahn-Banach theorem, uniform-boundedness theorem, closed-graph theorem,  $L_p$ -spaces, compact operators, Banach algebras, spectral theory of self-adjoint operators. Prerequisite: MATH 552 or permission of the GMCC.

MATH 664, 665. GROUP THEORY I, II. (3, 3) Permutation groups, adelian groups, Sylow theorems, free groups, lattices, solvable groups, commutators, and group representations. Prerequisite: MATH 565 or permission of the GMCC.

MATH 667, 668. COMBINATORIAL ANALYSIS I, II. (3, 3) Permutations and combinations, Ramsey's theorem, generating functions, recurrence relations, principle of inclusion and exclusion, Polya's theory of counting, graph theory, max-flow and min-cut theorem. Prerequisites: MATH 362 (Linear Algebra II) and 364 (Abstract Algebra), or permission of the GMCC.

STATISTICS (STAT)

STAT 501, 502. PROBABILITY AND STATISTICS I, II. (3, 3) The axioms of probability, random variables and their probability distributions, multivariate probability distributions, functions of random variables, hypothesis testing, linear models and estimation, analysis of categorical data, non-parametric statistics. Prerequisites: MATH

164 (Calculus II) and CS 222 (Computer Programming in PASCAL), or permission of the GMCC. Neither course may be applied to the degree with the mathematics (M) emphasis.

**STAT 507. INTRODUCTION TO STATISTICAL COMPUTING AND DATA**

**MANAGEMENT.** (3) Components of digital computers, characteristics of magnetic storage devices, use of JCL and utility programs, concepts and techniques of research data management. Prerequisites: MATH 164 (Calculus II) and CS 222 (Computer Programming in PASCAL), or permission of the GMCC. Course may not be applied to the degree with the mathematics (M) emphasis.

**STAT 521. STATISTICAL METHODS I.** (3) Problems of description and goodness of fit, univariate location and scale, bivariate independence and correlation, comparison of independent or matched samples involving categorical, discrete, or continuous data, and non-parametric tests. Prerequisite: STAT 502 or permission of the GMCC.

**STAT 522. STATISTICAL METHODS II.** (3) Regression analysis, analysis of variance and covariance elements of experimental design, random-effects models, simultaneous inference, the general linear model. Prerequisite: STAT 521 or permission of the GMCC.

**STAT 621. ANALYSIS OF CATEGORICAL DATA.** (3) Analysis of categorized data, applications in epidemiology (contingency tables, rates, and relative risks), analysis by means of linear models, and methods for ordinal data. Prerequisite: STAT 522 or permission of the GMCC.

**STAT 622. APPLIED REGRESSION ANALYSIS AND OTHER MULTIVARIABLE METHODS.** (3) Regression analysis with emphasis on computational aspects and practical problems, discriminant analysis, factor analysis, principal components, canonical correlation. This course includes a term project. Prerequisite: STAT 621 or permission of the GMCC.

#### GRADUATE FACULTY

Mahmoud Anabtawi, Assistant Professor

B.S., 1991, Yarmouk University (Jordan); M.S., 1994, Tennessee State University; Ph.D., 1998, University of Texas

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The Department of Social Work and Sociology does not offer a degree program, but does offer a limited number of graduate courses to supplement the degree programs of other departments. The purpose of the study of Sociology is to develop understanding of human social behavior and to assist in the development of institutional agendas for dealing with contemporary social problems.

**Minor**

A graduate minor in Sociology consists of 12 semester hours of course work approved by the advisor in the major program.

**COURSE OFFERINGS**

SOC 500	Rural Sociology	3
SOC 514	Fundamentals of Sociology	3
SOC 515	Current Perspectives in Urban Sociology	3
SOC 516	Urban Community Life	3
SOC 518	Complex Organization	3
SOC 520	Educational Sociology	3
SOC 524	Advanced Social Psychology	3
SOC 528	Seminar in Cultural Anthropology	3
SOC 530	Social Movements	3
SOC 590	Selected Topics in Sociology	3
SOC 600	Sociology of Organizations	3
SOC 603	Political Sociology	3
SOC 606	Medical Sociology	3
SOC 620	Advanced Educational Sociology	3

**DESCRIPTION OF COURSES**

- SOC 500. RURAL SOCIOLOGY. (3) Changes in the rural way of life, the rural community, and the rural social institutions in the United States and the world.*
- SOC 514. FUNDAMENTALS OF SOCIOLOGY. (3) The basic concepts of social structure and behavior. This course is a prerequisite for those who have not had introductory courses in Sociology.*
- SOC 515. CURRENT PERSPECTIVES IN URBAN SOCIOLOGY. (3) Current thinking and research on urban life.*
- SOC 516. URBAN COMMUNITY LIFE. (3) The mechanics and dynamics of the urban environment, including education, the family, politics, and other institutions.*
- SOC 518. COMPLEX ORGANIZATION. (3) The structure and function of formal institutions, and the sociological perspective on their potential.*
- SOC 520. EDUCATIONAL SOCIOLOGY. (3) An analysis of the forces which are at work in educational systems. Minority issues in education are a focus.*
- SOC 524. ADVANCED SOCIAL PSYCHOLOGY. (3) The systematic interpretation of the behavioral and mental processes of individuals within social contexts.*
- SOC 528. SEMINAR IN CULTURAL ANTHROPOLOGY. (3) An introduction to the systematic study of the symbolic life of cultures, with emphasis on language and the meanings derived from myths and governing ideas.*
- SOC 530. SOCIAL MOVEMENTS. (3) A study of the often dramatic ways that groups have changed the structure of their societies.*
- SOC 590. SELECTED TOPICS IN SOCIOLOGY. (3) The opportunity to pursue focused studies on areas not covered by the regular course offerings.*
- SOC 600. SOCIOLOGY OF ORGANIZATIONS. (3) A course which focuses on social characteristics which determine organizational structure and promote organizational change. The developmental approach is used.*
- SOC 603. POLITICAL SOCIOLOGY. (3) The study of the distribution of power in society, through the nominal political institutions and in the other areas of political life.*

*SOC 606. MEDICAL SOCIOLOGY. (3) The medical and healthcare establishment, and the social dynamics within and without it, as they pertain to the delivery of health services.*

*SOC 620. ADVANCED EDUCATIONAL SOCIOLOGY. (3) The second in the Departmental sequence in the study of educational institutions and issues facing them today.*

GRADUATE FACULTY

Anthony J. Blasi, Professor

B.A., 1968, St. Edward's University; M.A., 1971, University of Notre Dame; M.A., 1984, University of St. Michael's College (Canada); S.T.L., 1985, Regis College (Canada); Th.D., 1986, Regis College and University of Toronto; Ph.D., 1974, University of Notre Dame

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